Henning Friis Poulsen - DTU Orbit (04/02/2018)

Henning Friis Poulsen

Organisations

Research Professor, Risø National Laboratory for Sustainable Energy
11/01/2007 → 07/04/2016 Former
hfpo@risoe.dtu.dk
VIP

Professor, Department of Physics
12/12/2011 → present
hfpo@fysik.dtu.dk
VIP

Neutrons and X-rays for Materials Physics
28/06/2012 → present
VIP

Publications:

A spectral geometric model for Compton single scatter in PET based on the single scatter simulation approximation: Paper
We investigate the idealized mathematical model of single scatter in PET for a detector system possessing excellent energy resolution. The model has the form of integral transforms estimating the distribution of photons undergoing a single Compton scattering with a certain angle. The total single scatter is interpreted as the volume integral over scatter points that constitute a rotation body with a football shape, while single scattering with a certain angle is evaluated as the surface integral over the boundary of the rotation body. The equations for total and sample single scatter calculations are derived using a single scatter simulation approximation. We show that the three-dimensional slice-by-slice filtered backprojection algorithm is applicable for scatter data inversion provided that the attenuation map is assumed to be constant. The results of the numerical experiments are presented.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Department of Physics, Neutrons and X-rays for Materials Physics, Scientific Computing, Institute of Computational Mathematics and Mathematical Geophysics
Authors: Kazantsev, I. (Ekstern), Olsen, U. L. (Intern), Poulsen, H. F. (Intern), Hansen, P. C. (Intern)
Number of pages: 15
Publication date: 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: Inverse Problems
Volume: 34
Issue number: 2
Article number: 024002
ISSN (Print): 0266-5611
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.84 SJR 1.502 SNIP 1.386
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.389 SNIP 1.411 CiteScore 1.82
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.257 SNIP 1.346 CiteScore 1.63
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.19 SNIP 1.566 CiteScore 2.13
Disclosed is a CT system for performing measurements on an object. The CT system comprises a support element for supporting the object; a radiation source for radiating the object at a plurality of different angles; a radiation detector assembly for detecting radiation passed through the object and in response thereto generate radiation data; and a processing unit operatively connected to the radiation detector assembly. The radiation detector assembly comprises a support, a first detector array, and a second detector array, the first detector array and the second detector array being attached to the support. The processing is configured to generate tomographic images of the object by processing radiation data received from the radiation detector assembly together with first calibration data describing properties of the first detector array and second calibration data describing properties of the second detector array.

**General information**
State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics
Authors: Gundlach, C. (Intern), Poulsen, H. F. (Intern)
Publication date: 2 Nov 2017

**Publication information**
IPC: G01N 23/ 04 A I
Patent number: WO2017186804
Date: 02/11/2017
Priority date: 26/04/2016
Priority number: EP20160167137
Original language: English
Electronic versions:
WO2017186804A1.pdf
A METHOD OF SECURITY SCANNING OF CARRY-ON ITEMS, AND A CARRY-ON ITEMS SECURITY SCANNING SYSTEM

A security scanning system (1) comprises a first stage module (3) having at least one X-ray source (6) and at least three first detectors (7) that are line-shaped and arranged in mutually different orientations and have at least dual energy resolution. A group of carry-on items (4) on a carrier are scanned simultaneously in the first stage module solely by transmission contrast radiography generating projections of two-dimensional image data. A processing device (9) reconstructs a 3D representation of the carry-on items and analyzes the 3D representation to determine whether further scanning is required.

Determining material parameters using phase-field simulations and experiments

A method to determine material parameters by comparing the evolution of experimentally determined 3D microstructures to simulated 3D microstructures is proposed. The temporal evolution of a dendritic solid-liquid mixture is acquired in situ using x-ray tomography. Using a time step from these data as an initial condition in a phase-field simulation, the computed structure is compared to that measured experimentally at a later time. An optimization technique is used to find the material parameters that yield the best match of the simulated microstructure to the measured microstructure in a global manner. The proposed method is used to determine the liquid diffusion coefficient in an isothermal Al-Cu alloy. However, the method developed is broadly applicable to other experiments in which the evolution of the three-dimensional microstructure is determined in situ. We also discuss methods to describe the local variation of the best-fit parameters and the fidelity of the fitting. We find a liquid diffusion coefficient that is different from that measured using directional solidification.
Phase-field method, X-ray tomography, Coarsening, Al alloys, Temporal evolution

Original language: English

Phase-field method, X-ray tomography, Coarsening, Al alloys, Temporal evolution

Electronic versions:

filestore.pdf

DOIs:

10.1016/j.actamat.2017.02.056
Simulating and optimizing compound refractive lens-based X-ray microscopes

A comprehensive optical description of compound refractive lenses (CRLs) in condensing and full-field X-ray microscopy applications is presented. The formalism extends ray-transfer matrix analysis by accounting for X-ray attenuation by the lens material. Closed analytical expressions for critical imaging parameters such as numerical aperture, spatial acceptance (vignetting), chromatic aberration and focal length are provided for both thin- and thick-lens imaging geometries. These expressions show that the numerical aperture will be maximized and chromatic aberration will be minimized at the thick-lens limit. This limit may be satisfied by a range of CRL geometries, suggesting alternative approaches to improving the resolution and efficiency of CRLs and X-ray microscopes.
Ultra-low-angle boundary networks within recrystallizing grains

We present direct evidence of a network of well-defined ultra-low-angle boundaries in bulk recrystallizing grains of 99.5% pure aluminium (AA1050) by means of a new, three-dimensional X-ray mapping technique; dark-field X-ray microscopy. These boundaries separate lattice orientation differences on the order of 0.05° and thus subdivide the recrystallizing grain into 2–7 μm wide domains. During further annealing the orientation differences decrease and the overall structure become more uniform while the network remains. It is observed that the morphology of the grain boundaries surrounding the recrystallizing grains relate to the intragranular network and effects hereof on the boundary migration is discussed.

General information
State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics, Department of Wind Energy, Materials science and characterization, DTU Danchip, European Synchrotron Radiation Facility
Number of pages: 5
Pages: 87-91
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Scripta Materialia
Volume: 139
ISSN (Print): 1359-6462
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.71 SJR 1.901 SNIP 1.696
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.3 SNIP 1.876 CiteScore 3.54
X-ray diffraction microscopy based on refractive optics

A formalism is presented for dark-field X-ray microscopy using refractive optics. The new technique can produce three-dimensional maps of lattice orientation and axial strain within millimetre-sized sampling volumes and is particularly suited to in situ studies of materials at hard X-ray energies. An objective lens in the diffracted beam magnifies the image and acts as a very efficient filter in reciprocal space, enabling the imaging of individual domains of interest with a resolution of 100 nm. Analytical expressions for optical parameters such as numerical aperture, vignetting, and the resolution in both direct
and reciprocal spaces are provided. It is shown that the resolution function in reciprocal space can be highly anisotropic and varies as a function of position in the field of view. Inserting a square aperture in front of the objective lens facilitates disjunct and space-filling sampling, which is key for three-dimensional reconstruction and analysis procedures based on the conservation of integrated intensity. A procedure for strain scanning is presented. Finally the formalism is validated experimentally at an X-ray energy of 17 keV.

General information
State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics, European Synchrotron Radiation Facility
Number of pages: 16
Pages: 1441-1456
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Applied Crystallography
Volume: 50
Issue number: 5
ISSN (Print): 0021-8898
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.51 SJR 1.242 SNIP 1.234
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.322 SNIP 2.588 CiteScore 3.97
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.585 SNIP 4.371 CiteScore 4.76
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.921 SNIP 6.392 CiteScore 6
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.572 SNIP 4.687 CiteScore 4.67
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.015 SNIP 5.863 CiteScore 5.32
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.6 SNIP 2.078
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 3.235 SNIP 2.117
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.126 SNIP 2.101
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.674 SNIP 3.489
Advanced microstructural analysis of cyclically deforming metallic materials towards lifetime improvement

General information
State: Published
Organisations: Department of Mechanical Engineering, Materials and Surface Engineering, Department of Physics, Neutrons and X-rays for Materials Physics, Deutsches Elektronen-Synchrotron
Authors: Diederichs, A. M. (Intern), Lienert, U. (Ekstern), Poulsen, H. F. (Intern), Pantleon, W. (Intern)
Number of pages: 1
Publication date: 2016
Main Research Area: Technical/natural sciences
Links:
http://www.sustain.dtu.dk/

Bibliographical note
Sustain Abstract M-1
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2016

A multiple length scale description of the mechanism of elastomer stretching
Conventionally, the stretching of rubber is modeled exclusively by rotations of segments of the embedded polymer chains; i.e. changes in entropy. However models have not been tested on all relevant length scales due to a lack of appropriate probes. Here we present a universal X-ray based method for providing data on the structure of rubbers in the 2-50 angstrom range. First results relate to the elongation of a silicone rubber. We identify several non-entropic contributions to the free energy and describe the associated structural changes. By far the largest contribution comes from structural changes within the individual monomers, but among the contributions is also an elastic strain, acting between chains, which is 3-4 orders of magnitude smaller than the macroscopic strain, and of the opposite sign, i.e. extension of polymer chains in the direction perpendicular to the stretch. This may be due to trapped entanglements relaxing to positions close to the covalent crosslinks.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, The Danish Polymer Centre, Department of Physics, Neutrons and X-rays for Materials Physics, Oak Ridge National Laboratory, University of New South Wales, European Synchrotron Radiation Facility, Roskilde University
Authors: Neuefeind, J. (Ekstern), Skov, A. L. (Intern), Daniels, J. E. (Ekstern), Honkimaki, V. (Ekstern), Jakobsen, B. (Ekstern), Oddershede, J. (Intern), Poulsen, H. F. (Intern)
A Spectral Geometrical Model for Compton Scatter Tomography Based on the SSS Approximation

The forward model of single scatter in the Positron Emission Tomography for a detector system possessing an excellent spectral resolution under idealized geometrical assumptions is investigated. This model has the form of integral equations describing a flux of photons emanating from the same annihilation event and undergoing a single scattering at a certain angle. The equations for single scatter calculation are derived using the Single Scatter Simulation approximation. We show that the three-dimensional slice-by-slice filtered backprojection algorithm is applicable for scatter data inversion provided some assumptions on the attenuation map are justified.

General information
State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics, Department of Applied Mathematics and Computer Science, Scientific Computing, Institute of Computational Mathematics and Mathematical Geophysics
Authors: Kazantsev, I. G. (Ekstern), Olsen, U. L. (Intern), Poulsen, H. F. (Intern), Hansen, P. C. (Intern)
Pages: 577-580
Publication date: 2016

Host publication information
Title of host publication: Proceedings of the The 4th International Conference on Image Formation in X-Ray Computed Tomography
DanMAX - The Danish beamline for in situ materials studies at MAX IV

General information
State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics, Aarhus University
Authors: Jørgensen, M. R. V. (Ekstern), Kantor, I. (Intern), Bergbäck Knudsen, E. (Intern), Poulsen, H. F. (Intern), Iversen, B. B. (Ekstern)
Publication date: 2016
Main Research Area: Technical/natural sciences
DanMAX, synchrotron powder X-ray diffraction, Instrumentation, MAX IV, Materials science, Tomography
Source: FindIt
Source-ID: 2349115945
Publication: Research › Poster – Annual report year: 2016

Full-field hard x-ray microscopy with interdigitated silicon lenses
Full-field x-ray microscopy using x-ray objectives has become a mainstay of the biological and materials sciences. However, the inefficiency of existing objectives at x-ray energies above 15 keV has limited the technique to weakly absorbing or two-dimensional (2D) samples. Here, we show that significant gains in numerical aperture and spatial resolution may be possible at hard x-ray energies by using silicon-based optics comprising `interdigitated’ refractive silicon lenslets that alternate their focus between the horizontal and vertical directions. By capitalizing on the nano-manufacturing processes available to silicon, we show that it is possible to overcome the inherent inefficiencies of silicon-based optics and interdigitated geometries. As a proof-of-concept of Si-based interdigitated objectives, we demonstrate a prototype interdigitated lens with a resolution of ≈255 nm at 17 keV.

General information
State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics, DTU Danchip, Experimental Surface and Nanomaterials Physics, Department of Micro- and Nanotechnology, Silicon Microtechnology, European Synchrotron Radiation Facility
Pages: 460-464
Publication date: 2016
Main Research Area: Technical/natural sciences

Publication information
Journal: Optics Communications
Volume: 359
ISSN (Print): 0030-4018
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 1.65 SJR 0.633 SNIP 0.924
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.711 SNIP 0.987 CiteScore 1.62
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Multigrain indexing of unknown multiphase materials

A multigrain indexing algorithm for use with samples comprising an arbitrary number of known or unknown phases is presented. No a priori crystallographic knowledge is required. The algorithm applies to data acquired with a monochromatic beam and a conventional two-dimensional detector for diffraction. Initially, candidate grains are found by searching for crystallographic planes, using a Dirac comb convoluted with a box function as a filter. Next, candidate grains are validated and the unit cell is optimized. The algorithm is validated by simulations. Simulations of 500 cementite grains
and similar to 100 reflections per grain resulted in 99.2% of all grains being indexed correctly and 99.5% of the reflections becoming associated with the right grain. Simulations with 200 grains associated with four mineral phases and 50-700 reflections per grain resulted in 99.9% of all grains being indexed correctly and 99.9% of the reflections becoming associated with the right grain. The main limitation is in terms of overlap of diffraction spots and computing time. Potential areas of use include three-dimensional grain mapping, structural solution and refinement studies of complex samples, and studies of dilute phases.

**General information**

State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics
Authors: Wejdemann, C. (Intern), Poulsen, H. F. (Intern)
Number of pages: 6
Pages: 616-621
Publication date: 2016
Main Research Area: Technical/natural sciences

**Publication information**

Journal: Journal of Applied Crystallography
Volume: 49
Issue number: 2
ISSN (Print): 0021-8898
Ratings:
- BFI (2018): BFI-level 2
- Web of Science (2018): Indexed yes
- BFI (2017): BFI-level 1
- Web of Science (2017): Indexed Yes
- BFI (2016): BFI-level 1
- Scopus rating (2016): CiteScore 2.51 SJR 1.242 SNIP 1.234
- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 1
- Scopus rating (2015): SJR 2.322 SNIP 2.588 CiteScore 3.97
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 1
- Scopus rating (2014): SJR 2.585 SNIP 4.371 CiteScore 4.76
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 2
- Scopus rating (2013): SJR 2.921 SNIP 6.392 CiteScore 6
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): SJR 2.572 SNIP 4.687 CiteScore 4.67
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 2
- Scopus rating (2011): SJR 3.015 SNIP 5.863 CiteScore 5.32
- ISI indexed (2011): ISI indexed yes
- Web of Science (2011): Indexed yes
- BFI (2010): BFI-level 2
- Scopus rating (2010): SJR 2.6 SNIP 2.078
- Web of Science (2010): Indexed yes
- BFI (2009): BFI-level 2
- Scopus rating (2009): SJR 3.235 SNIP 2.117
- Web of Science (2009): Indexed yes
- BFI (2008): BFI-level 2
- Scopus rating (2008): SJR 2.126 SNIP 2.101
- Web of Science (2008): Indexed yes
- Scopus rating (2007): SJR 1.674 SNIP 3.489
Multiscale 3D characterization with dark-field x-ray microscopy

Dark-field x-ray microscopy is a new way to three-dimensionally map lattice strain and orientation in crystalline matter. It is analogous to dark-field electron microscopy in that an objective lens magnifies diffracting features of the sample; however, the use of high-energy synchrotron x-rays means that these features can be large, deeply embedded, and fully mapped in seconds to minutes. Simple reconfiguration of the x-ray objective lens allows intuitive zooming between different scales down to a spatial and angular resolution of 100 nm and 0.001 degrees, respectively. Three applications of the technique are presented-mapping the evolution of subgrains during the processing of plastically deformed aluminum, mapping domains and strain fields in ferroelectric crystals, and the three-dimensional mapping of strain fields around individual dislocations. This ability to directly characterize complex, multiscale phenomena in situ is a key step toward formulating and validating multiscale models that account for the entire heterogeneity of materials.
Noise robustness of a combined phase retrieval and reconstruction method for phase-contrast tomography

Classical reconstruction methods for phase-contrast tomography consist of two stages: phase retrieval and tomographic reconstruction. A novel algebraic method combining the two was suggested by Kostenko et al. [Opt. Express 21, 12185 (2013) [CrossRef], and preliminary results demonstrated improved reconstruction compared with a given two-stage method. Using simulated free-space propagation experiments with a single sample-detector distance, we thoroughly compare the novel method with the two-stage method to address limitations of the preliminary results. We demonstrate that the novel method is substantially more robust toward noise; our simulations point to a possible reduction in counting times by an order of magnitude.

General information

State: Published
Organisations: Department of Applied Mathematics and Computer Science, Scientific Computing, Department of Physics, Neutrons and X-rays for Materials Physics
Authors: Kongskov, R. D. (Intern), Jørgensen, J. S. (Intern), Poulsen, H. F. (Intern), Hansen, P. C. (Intern)
Pages: 447-454
Quantifying the onset of recrystallization in deformed metals using x-rays

General information
State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics
Authors: Ahl, S. R. (Intern), Simons, H. (Intern), Poulsen, H. F. (Intern)
Number of pages: 1
Publication date: 2016
Main Research Area: Technical/natural sciences
Links:
http://www.sustain.dtu.dk/
Dark-field X-ray microscopy for multiscale structural characterization

Many physical and mechanical properties of crystalline materials depend strongly on their internal structure, which is typically organized into grains and domains on several length scales. Here we present dark-field X-ray microscopy; a non-destructive microscopy technique for the three-dimensional mapping of orientations and stresses on lengths scales from 100 nm to 1mm within embedded sampling volumes. The technique, which allows 'zooming' in and out in both direct and angular space, is demonstrated by an annealing study of plastically deformed aluminium. Facilitating the direct study of the interactions between crystalline elements is a key step towards the formulation and validation of multiscale models that account for the entire heterogeneity of a material. Furthermore, dark-field X-ray microscopy is well suited to applied topics, where the structural evolution of internal nanoscale elements (for example, positioned at interfaces) is crucial to the performance and lifetime of macro-scale devices and components thereof.
Dark field X-ray microscopy for studies of recrystallization

We present the recently developed technique of Dark Field X-Ray Microscopy that utilizes the diffraction of hard X-rays from individual grains or subgrains at the (sub)micrometre-scale embedded within mm-sized samples. By magnifying the diffracted signal, 3D mapping of orientations and strains inside the selected grain is performed with an angular resolution of 0.005° and a spatial resolution of 200 nm. Furthermore, the speed of the measurements at high-intensity synchrotron facilities allows for fast non-destructive in situ determination of structural changes induced by annealing or other external influences. The capabilities of Dark Field X-Ray Microscopy are illustrated by examples from an ongoing study of recrystallization of 50% cold-rolled Al1050 specimens.

General information
State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics, Department of Wind Energy, Materials science and characterization, DTU Danchip
Number of pages: 7
Publication date: 2015
Main Research Area: Technical/natural sciences

Publication information
Journal: I O P Conference Series: Materials Science and Engineering
Volume: 89
Article number: 012016
ISSN (Print): 1757-8981
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.39 SJR 0.187 SNIP 0.499
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.172 SNIP 0.281 CiteScore 0.22
Scopus rating (2014): SJR 0.186 SNIP 0.306 CiteScore 0.18
Scopus rating (2013): SJR 0.183 SNIP 0.256 CiteScore 0.16
ISI indexed (2013): ISI indexed no
Scopus rating (2012): SJR 0.161 SNIP 0.203 CiteScore 0.14
ISI indexed (2012): ISI indexed no
Scopus rating (2011): SJR 0.155 SNIP 0.149 CiteScore 0.1
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 0.151 SNIP 0.112
Original language: English
Electronic versions:
012016.pdf
DOIs:
10.1088/1757-899X/89/1/012016

Bibliographical note
This work is licensed under a Creative Commons Attribution 4.0 International License. The images or other third party material in this article are included in the article’s Creative Commons license, unless indicated otherwise in the credit line; if the material is not included under the Creative Commons license, users will need to obtain permission from the license holder to reproduce the material.
Source: FindIt
Source-ID: 274112210
Publication: Research - peer-review › Journal article – Annual report year: 2015
Generalized balanced power diagrams for 3D representations of polycrystals

Characterizing the grain structure of polycrystalline material is an important task in material science. The present paper introduces the concept of generalized balanced power diagrams as a concise alternative to voxelated mappings. Here, each grain is represented by (measured approximations of) its centre of mass position, its volume and, if available, and by its second-order moments (in the non-equiaxed case). Such parameters may be obtained from 3D X-ray diffraction. As the exact global optimum of our model results from the solution of a suitable linear programme it can be computed quite efficiently. Based on verified real-world measurements, we show that from the few parameters per grain (3, respectively, 6 in 2D and 4, respectively, 10 in 3D) we obtain excellent representations of both equiaxed and non-equiaxed structures. Hence our approach seems to capture the physical principles governing the forming of such polycrystals in the underlying process quite well.
Injection molded polymeric hard X-ray lenses

A novel and economical approach for fabricating compound refractive lenses for the purpose of focusing hard X-rays is described. A silicon master was manufactured by UV-lithography and deep reactive ion etching (DRIE). Sacrificial structures were utilized, which enabled accurate control of the etching profile and were removed after DRIE. By electroplating, an inverse nickel sample was obtained, which was used as a mold insert in a commercial polymer injection molding machine. A prototype lens made of polyethylene with a focal length of 350 mm was tested using synchrotron radiation at photon energies of 17 keV. A 55 µm long line focus with a minimal waist of 770 nm (FWHM) and a total lens transmittance of 32% were measured. Due to its suitability for cheap mass production, this highly efficient optics may find widespread use in hard X-ray instruments.

General information
State: Published
Organizations: DTU Danchip, Neutrons and X-rays for Materials Physics, Department of Physics, Experimental Surface and Nanomaterials Physics, Department of Micro- and Nanotechnology, Silicon Microtechnology
Pages: 2804-2811
Publication date: 2015
Main Research Area: Technical/natural sciences

Publication information
Journal: Optical Materials Express
Volume: 5
Issue number: 12
ISSN (Print): 2159-3930
Ratings:
Web of Science (2018): Indexed yes
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 2.74 SJR 1.082 SNIP 1.287
Web of Science (2016): Indexed yes
Scopus rating (2015): SJR 1.406 SNIP 1.411 CiteScore 3.07
Web of Science (2015): Indexed yes
Scopus rating (2014): SJR 1.546 SNIP 1.653 CiteScore 3.17
Scopus rating (2013): SJR 1.761 SNIP 2.378 CiteScore 3.42
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Scopus rating (2012): SJR 1.625 SNIP 1.831 CiteScore 2.58
This thesis deals with the development of silicon compound refractive lenses (Si-CRLs) for shaping hard x-ray beams. The Si-CRLs are to be fabricated using state of the art microfabrication techniques. The primary goal of the thesis work is to produce Si-CRLs with considerably increased structure heights and improved uniformity compared to what is currently available. To this end, established fabrication procedures are improved and the toolbox used for lens development is enriched.

The central theme of this thesis is x-ray microscopy (XRM). As a spearhead of today's materials research it provides characterization details that cannot be obtained by other means. The respective x-ray techniques largely benefit from continuously improved x-ray sources, x-ray detectors and x-ray optics. For instance, some techniques aiming for structural investigation of poly-crystalline materials directly benefit from more intense and wider line beams with narrower waists. The thesis starts with a review of alternative x-ray lenses. Si-CRLs are identified as valuable optical components that allow shaping hard x-rays efficiently and creating beam waists that are clearly in the nanometer range. They stand out by their potential for compact integration, which makes them cost-effective, easy to handle and stable on-axis optics.

A Si-CRL comprises multiple bi-parabolic cylindrical cavities. The bi-parabolic patterns are defined lithographically and vertically transferred into the Si substrate using deep reactive ion etching (DRIE). Based on a theoretical framework for CRLs, stringent requirements on the pattern transfer are found. Most crucially, the sidewalls of the cavities must be strictly parallel. Already slight deviations from the ideal parabolic shapes result in non-uniform and broadened waists of focused x-ray beams.

Two strategies are demonstrated, which guarantee shape fidelity, while the heights of etched lenses can be increased. Both are based on defining the bi-parabolic cavities at their perimeter by trenches of uniform width, where one trench wall is comprised of sacrificial material. The two strategies differ in the way the unwanted sacrificial material inside the cavities is removed subsequent to DRIE. While the first strategy utilizes etching of the trenches through the entire thickness of the wafer for releasing the sacrificial portions, the second strategy relies on thin sacrificial structures that can be completely oxidized and removed by selective etching. Both strategies have proven to be equally successful in achieving a substantial increase of the heights of Si-CRLs and to facilitate accurate sidewall profile control necessary for uniform x-ray focusing.

A precise manufacture in turn asks for highly precise metrology. Therefore, a mix of techniques including optical profilometry and atomic force microscopy (AFM) has been used to obtain reliable information about the detailed three-dimensional shapes of the lenses. Adequate sample preparation and measuring procedures have been developed. Inverse replica molding in PDMS of the CRLs was established as an effective way to circumvent the limitations AFM probes have when concave surfaces need to be characterized, e.g. due to the finite lengths of AFM probes.

Four different x-ray optical components have been designed, manufactured and characterized with respect to their shape.
Their optical performances were tested at the European Synchrotron Radiation Facility (ESRF). Two 1D-focusing Si-CRLs suitable as condensers in hard-XRM were developed utilizing the aforementioned two different strategies. The first Si-condenser showed focusing of a 56 keV x-ray beam into a 310 μm wide line and a waist of 980 nm (FWHM, full width at half maximum) at a focal length of 1.3 m. The second Si-condenser allowed the focusing of 17 keV x-rays into a 180 μm-wide line with a waist of 430 nm (FWHM) at a focal length of 0.215 m. Both systems leave plenty of space for sample surroundings and ensure low-divergent and wide x-ray beams with narrow waists. Both results are substantial improvements to what was available at the start of this thesis work.

The challenge of making x-ray objectives in silicon by interdigitation of lenslets alternately focusing in the vertical and horizontal directions was addressed. A functioning prototype of a 2D silicon objective for use in a bright-field hard-XRM was demonstrated. The results are promising; showing acceptably low aberration and performance close to theoretical expectations. A resolution of 300 nm with 17 keV x-rays and a focal length of 300 mm was achieved. By harnessing the potential for making more compact objectives and avoiding shape defects, one could significantly improve the focusing power, transmission and numerical aperture.

Polymer injection molding was explored as a novel route for x-ray lens manufacture. A Si-CRL template was used as a master for obtaining nickel mold inserts. CRLs made of polyethylene have proven to be promising highly efficient x-ray optics. A 55 μm long line focus with a minimal waist of 770 nm (FWHM) at a focal length of 350 mm was obtained with 17 keV x-rays. A final production rate larger than 10 pieces per hour indicates the economic value of injection molded x-ray lenses, which may have applications in more readily available small laboratory x-ray instruments or medical devices. In each case, observed non-uniformities of the shaped x-ray beams were investigated and found to be in agreement with the lens shape measurements. In iterative steps the lenses have been improved and the most recent results allow yet another whole range of improvements to be made. The fundamentals for an advanced fabrication of silicon CRLs are laid out, which will contribute to their future use in novel applications.

General information
State: Published
Organisations: DTU Danchip, Neutrons and X-rays for Materials Physics, Department of Micro- and Nanotechnology, Silicon Microtechnology, Department of Physics
Authors: Stöhr, F. (Intern), Hansen, O. (Intern), Jensen, F. (Intern), Poulsen, H. F. (Intern)
Number of pages: 191
Publication date: 2015

Optimizing shape uniformity and increasing structure heights of deep reactive ion etched silicon x-ray lenses: Paper
Line-focusing compound silicon x-ray lenses with structure heights exceeding 300 μm were fabricated using deep reactive ion etching. To ensure profile uniformity over the full height, a new strategy was developed in which the perimeter of the structures was defined by trenches of constant width. The remaining sacrificial material inside the lens cavities was removed by etching through the silicon wafer. Since the wafers become fragile after through-etching, they were then adhesively bonded to a carrier wafer. Individual chips were separated using laser micro machining and the 3D shape of fabricated lenses was thoroughly characterized by a variety of means. Optical testing using synchrotron radiation with a photon energy of 56 keV yielded a 300 μm wide beam with a waist of 980 nm (full width at half maximum) at a focal length of 1.3 m. Optical aberrations are discussed in the context of the shape analysis, where a slight bowing of the lens sidewalls and an insufficiently uniform apex region are identified as resolution-limiting factors. Despite these, the proposed fabrication route proved a viable approach for producing x-ray lenses with large structure heights and provides the means to improve the resolution and capabilities of modern x-ray techniques such as x-ray microscopy and 3D x-ray diffraction.

General information
State: Published
Organisations: DTU Danchip, Department of Physics, Neutrons and X-rays for Materials Physics, Experimental Surface and Nanomaterials Physics, Department of Micro- and Nanotechnology, Silicon Microtechnology, European Synchrotron Radiation Facility
Authors: Stöhr, F. (Intern), Wright, J. (Ekstern), Simons, H. (Intern), Michael-Lindhard, J. (Intern), Hübnner, J. (Intern), Jensen, F. (Intern), Hansen, O. (Intern), Poulsen, H. F. (Intern)
Number of pages: 10
Publication date: 2015
Main Research Area: Technical/natural sciences
Polymer injection molding of hard X-ray refractive optics

General information
State: Published
Organisations: DTU Danchip, Neutrons and X-rays for Materials Physics, Department of Physics, Experimental Surface and Nanomaterials Physics, Department of Micro- and Nanotechnology, Silicon Microtechnology
Number of pages: 1
Publication date: 2015
Main Research Area: Technical/natural sciences
X-ray optics, Polymer injection molding, Deep reactive ion etching
Electronic versions:
MNE2015_FS_01.pdf
Source: PublicationPreSubmission
Source-ID: 118322738
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2015

Sacrificial structures for deep reactive ion etching of high-aspect ratio kinoform silicon x-ray lenses
This article describes the realization of complex high-aspect ratio silicon structures with feature dimensions from 100 lm to 100nm by deep reactive ion etching using the Bosch process. As the exact shape of the sidewall profiles can be crucial for the proper functioning of a device, the authors investigated how sacrificial structures in the form of guarding walls and pillars may be utilized to facilitate accurate control of the etch profile. Unlike other sacrificial structuring approaches, no silicon-on-insulator substrates or multiple lithography steps are required. In addition, the safe removal of the sacrificial structures was accomplished by thermal oxidation and subsequent selective wet etching. The effects of the dimensions and relative placement of sacrificial walls and pillars on the etching result were determined through systematic experiments. The authors applied this process for exact sidewall control in the manufacture of x-ray lenses that are very sensitive to sidewall shape nonuniformities. Compound kinoform lenses for focusing hard x-rays with structure heights of 200 lm were manufactured, and the lenses were tested in terms of their focusing ability and refracting qualities using synchrotron radiation at a photon energy of 17 keV. A 180 lm long line focus with a waist of 430 nm at a focal length of 215mm was obtained.

General information
State: Published
Organisations: DTU Danchip, Neutrons and X-rays for Materials Physics, Department of Physics, Experimental Surface and Nanomaterials Physics
Number of pages: 10
Publication date: 2015
Main Research Area: Technical/natural sciences

Publication information
Volume: 33
Issue number: 6
Article number: 062001
ISSN (Print): 1071-1023
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Three-dimensional nanometrology of microstructures by replica molding and large-range atomic force microscopy

We have used replica molding and large-range atomic force microscopy to characterize the three-dimensional shape of high aspect ratio microstructures. Casting inverted replicas of microstructures using polydimethylsiloxane (PDMS) circumvents the inability of AFM probes to measure deep and narrow cavities. We investigated cylindrical deep reactive ion etched cavities in silicon wafers and determined the radius of curvature (ROC) of the sidewalls as a function of depth. Statistical analysis verified the reliability and reproducibility of the replication procedure. The mean ROC was determined as $(6.32 \pm 0.06)$ μm, i.e., with 1% accuracy, while the ROC linearly increases by $(0.52 \pm 0.03)$ μm from the top to the bottom of the sidewalls. Nanometer sized surface defects are also well replicated. In addition, the method allows combining multiple features from differently processed wafers into a single sample, accelerating characterization in process optimization tasks. To access the sidewall shape samples needed to be cleaved. The method was applied to study X-ray refractive optics, whose performance is crucially affected by their three-dimensional shapes.
Three-dimensional X-ray diffraction (3DXRD) microscopy is a fast and non-destructive structural characterization technique aimed at the study of individual crystalline elements (grains or subgrains) within mm-sized polycrystalline specimens. It is based on two principles: the use of highly penetrating hard X-rays from a synchrotron source and the application of “tomographic” reconstruction algorithms for the analysis of the diffraction data. In favorable cases, the position, morphology, phase, and crystallographic orientation can be derived for up to a thousand elements simultaneously. For each grain its average strain tensor may also be derived, from which the type-II stresses can be inferred. Furthermore, the dynamics of the individual elements can be monitored during typical processes such as deformation or annealing. Hence, information on the interaction between elements can be obtained directly. In this chapter we first provide an overview of the various experimental approaches for 3DXRD that have emerged. Following this, a more detailed presentation of work related to the classical 3DXRD setup is given. Some emphasis is also placed on the mathematical challenges inherent to the reconstruction of grain and orientation maps.
Efficient Analytical Approaches to the Optics of Compound Refractive Lenses for Use with Synchrotron X-rays

The properties of compound refractive lenses (CRLs) of biconcave parabolic lenses for focusing and imaging synchrotron X-rays have been investigated theoretically by ray transfer matrix analysis and Gaussian beam propagation. We present approximate analytical expressions, that allow fast estimation of the CRL characteristics, and build intuition into the design of advanced CRL optics.

General information
State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics, Northwestern University
Authors: Poulsen, S. O. (Ekstern), Poulsen, H. F. (Intern)
Pages: 4772-4779
Publication date: 2014

Main Research Area: Technical/natural sciences

Publication information
Journal: Metallurgical and Materials Transactions A - Physical Metallurgy and Materials Science
Volume: 45A
Issue number: 11
ISSN (Print): 1073-5623
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2016): CiteScore 1.91 SJR 1.179 SNIP 1.179
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.231 SNIP 1.332 CiteScore 1.78
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.671 SNIP 1.877 CiteScore 2.06
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.481 SNIP 1.63 CiteScore 1.9
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.419 SNIP 1.706 CiteScore 1.76
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.508 SNIP 1.703 CiteScore 1.78
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.688 SNIP 1.802
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.608 SNIP 1.53
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
High-Resolution Reciprocal Space Mapping for Characterizing Deformation Structures

With high-angular resolution three-dimensional X-ray diffraction (3DXRD), quantitative information is gained about dislocation structures in individual grains in the bulk of a macroscopic specimen by acquiring reciprocal space maps. In high-resolution 3D reciprocal space maps of tensile-deformed copper, individual, almost dislocation-free subgrains are identified from high-intensity peaks and distinguished by their unique combination of orientation and elastic strain; dislocation walls manifest themselves as a smooth cloud of lower intensity. The elastic strain shows only minor variations within each subgrain, but larger variations between different subgrains. On average, subgrains experience backward strains, whereas dislocation walls are strained in a forward direction. Based on these observations the necessary revision of the classical composite model is outlined. Additionally, subgrain dynamics is followed in situ during varying loading conditions by reciprocal space mapping: during uninterrupted tensile deformation, formation of subgrains is observed concurrently with broadening of Bragg reflections shortly after the onset of plastic deformation. When the traction is terminated, stress relaxation occurs, but no changes in number, size and orientation of the subgrains are observed. The radial profile asymmetry becomes reversed, when pre-deformed specimens are deformed in tension along a perpendicular axis.

General information
Refractive and diffractive neutron optics with reduced chromatic aberration

Thermal neutron beams are an indispensable tool in physics research. The spatial and the temporal resolution attainable in experiments are dependent on the flux and collimation of the neutron beam which remain relatively poor, even for modern neutron sources. These difficulties may be mitigated by the use of optics for focusing and imaging. Refractive and diffractive optical elements, e.g. compound refractive lenses and Fresnel zone plates, are attractive due to their low cost, and simple alignment. These optical elements, however, suffer from chromatic aberration, which limit their effectiveness to highly monochromatic beams. This paper presents two novel concepts for focusing and imaging non-monochromatic thermal neutron beams with well-known optical elements: (1) a fast mechanical transfocator based on a compound refractive lens, which actively varies the number of individual lenses in the beam path to focus and image a time-of-flight beam, and (2) a passive optical element consisting of a compound refractive lens, and a Fresnel zone plate, which may focus and image both continuous and pulsed neutron beams.
Three-Dimensional Characterization of X-ray Refractive Optics

General information
State: Published
Organisations: DTU Danchip, Department of Physics, Neutrons and X-rays for Materials Physics, Experimental Surface and Nanomaterials Physics, Department of Micro- and Nanotechnology, Silicon Microtechnology, Danish Fundamental Metrology, European Synchrotron Radiation Facility
Number of pages: 1
Publication date: 2014

Host publication information
Title of host publication: Proceedings of the 40th International Conference on Micro and Nano Engineering
Main Research Area: Technical/natural sciences
In Situ Observation of the Dislocation Structure Evolution During a Strain Path Change in Copper

The evolution of deformation structures in individual grains embedded in polycrystalline copper specimens during strain path changes is observed in situ by high-resolution reciprocal space mapping with high-energy synchrotron radiation. A large number of individual subgrains is resolved; their behavior during the strain path change is revealed and complemented by the analysis of radial x-ray peak profiles for the entire grain. This allows distinction between two different regimes during the mechanically transient behavior following the strain path change. Below 0.3% strain, the number and orientation of the resolved subgrains change only slightly, while their elastic stresses are significantly altered. This indicates the existence of a microplastic regime during which only the subgrains deform plastically and no yielding of the dislocation walls occurs. After reloading above 0.3% strain, the elastic stresses of individual subgrains are about the same.
as in unidirectionally deformed reference specimens. They increase only slightly during further straining—accompanied by occasional emergence of new subgrains, abundant orientation changes, and disappearance of existing subgrains.

**General information**

State: Published
Organisations: Department of Photonics Engineering, Department of Physics, Department of Mechanical Engineering, Materials and Surface Engineering, Deutsches Elektronen-Synchrotron
Authors: Wejdemann, C. (Intern), Poulsen, H. F. (Intern), Lienert, U. (Ekstern), Pantleon, W. (Intern)
Pages: 35-43
Publication date: 2013
Main Research Area: Technical/natural sciences

**Publication information**
Journal: J O M
Volume: 65
Issue number: 1
ISSN (Print): 1047-4838
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.009 SNIP 1.023 CiteScore 1.89
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.973 SNIP 1.22 CiteScore 1.72
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.946 SNIP 1.203 CiteScore 1.39
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.701 SNIP 1.094 CiteScore 1.13
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.765 SNIP 1.142 CiteScore 1.03
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.92 SNIP 1.41 CiteScore 1.23
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.818 SNIP 1.047
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.874 SNIP 1.166
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.151 SNIP 1.149
Scopus rating (2007): SJR 0.709 SNIP 1.087
Scopus rating (2006): SJR 0.547 SNIP 1.057
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.574 SNIP 1.171
Scopus rating (2004): SJR 0.496 SNIP 1.052
Scopus rating (2003): SJR 0.567 SNIP 1.045
Scopus rating (2002): SJR 0.537 SNIP 0.982
Scopus rating (2001): SJR 0.659 SNIP 1.009
Scopus rating (2000): SJR 0.537 SNIP 0.894
Scopus rating (1999): SJR 0.593 SNIP 0.941
Manufacturing and Characterization of Silicon Compound Refractive Lenses for Focussing of Hard X-Rays

General information
State: Published
Organisations: DTU Danchip, Neutrons and X-rays for Materials Physics, Department of Physics, Experimental Surface and Nanomaterials Physics, Department of Micro- and Nanotechnology, Silicon Microtechnology, European Synchrotron Radiation Facility
Number of pages: 1
Publication date: 2013
Event: Abstract from 22nd International Congress on X-Ray Optics and Microanalysis, Hamburg, Germany.
Main Research Area: Technical/natural sciences
Electronic versions:
Abstract - Poster Contribution - Stöhr et. al..pdf

Bibliographical note
Poster abstract
Source: dtu
Source-ID: u::10878
Publication: Research › Conference abstract for conference – Annual report year: 2014

McXtrace: A Monte Carlo software package for simulating X-ray optics, beamlines and experiments
This article presents the Monte Carlo simulation package McXtrace, intended for optimizing X-ray beam instrumentation and performing virtual X-ray experiments for data analysis. The system shares a structure and code base with the popular neutron simulation code McStas and is a good complement to the standard X-ray simulation software SHADOW. McXtrace is open source, licensed under the General Public License, and does not require the user to have access to any proprietary software for its operation. The structure of the software is described in detail, and various examples are given to showcase the versatility of the McXtrace procedure and outline a possible route to using Monte Carlo simulations in data analysis to gain new scientific insights. The studies performed span a range of X-ray experimental techniques: absorption tomography, powder diffraction, single-crystal diffraction and pump-and-probe experiments. Simulation studies are compared with experimental data and theoretical calculations. Furthermore, the simulation capabilities for computing coherent X-ray beam properties and a comparison with basic diffraction theory are presented. © 2013 International Union of Crystallography.

General information
State: Published
Organisations: Department of Physics, European Synchrotron Radiation Facility, Institut Laue-Langevin, University of Copenhagen
Pages: 679-696
Publication date: 2013
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Applied Crystallography
Volume: 46
Issue number: 3
ISSN (Print): 0021-8898
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.51 SJR 1.242 SNIP 1.234
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.322 SNIP 2.588 CiteScore 3.97
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.585 SNIP 4.371 CiteScore 4.76
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.921 SNIP 6.392 CiteScore 6
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.572 SNIP 4.687 CiteScore 4.67
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.015 SNIP 5.863 CiteScore 5.32
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.6 SNIP 2.078
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 3.235 SNIP 2.117
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.126 SNIP 2.101
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.674 SNIP 3.489
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.112 SNIP 7.433
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.817 SNIP 2.339
Scopus rating (2004): SJR 1.618 SNIP 2.239
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.206 SNIP 1.618
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 2.31 SNIP 2.589
Scopus rating (2001): SJR 1.7 SNIP 2.059
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.009 SNIP 2.005
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.269 SNIP 1.49
Original language: English
Computer program listings, Computer software, Diffraction, Experiments, Monte Carlo methods, X ray optics, X rays, Open systems
DOIs:
An introduction to three-dimensional X-ray diffraction microscopy

Three-dimensional X-ray diffraction microscopy is a fast and nondestructive structural characterization technique aimed at studies of the individual crystalline elements (grains or subgrains) within millimetre-sized polycrystalline specimens. It is based on two principles: the use of highly penetrating hard X-rays from a synchrotron source and the application of tomographic reconstruction algorithms for the analysis of the diffraction data. In favourable cases, the position, morphology, phase and crystallographic orientation can be derived for up to 1000 elements simultaneously. For each grain its average strain tensor may also be derived, from which the type II stresses can be inferred. Furthermore, the dynamics of the individual elements can be monitored during typical processes such as deformation or annealing. A review of the field is provided, with a viewpoint from materials science. © 2012 International Union of Crystallography Printed in Singapore—all rights reserved.
Box-scan: A novel 3DXRD method for studies of recrystallization and grain growth

Within the last decade a number of x-ray diffraction methods have been presented for non-destructive 3D characterization of polycrystalline materials. 3DXRD [1] and Diffraction Contrast Tomography [2,3,4] are examples of such methods providing full spatial and crystallographic information of the individual grains. Both methods rely on specially designed high-resolution near-field detectors for acquire the shape of the illuminated grains, and therefore the spatial resolution is for both methods limited by the resolution of the detector, currently ~2 micrometers. Applying these methods using conventional far-field detectors provides information on centre of mass, crystallographic orientation and stress state of the individual grains [5], at the expense of high spatial resolution. However, far-field detectors have much higher efficiency than near-field detectors, and as such are suitable for dynamic studies requiring high temporal resolution and set-ups involving bulky sample environments (e.g. furnaces, stress-rigs etc.)
Measuring the stress field around an evolving crack in tensile deformed Mg AZ31 using three-dimensional X-ray diffraction

The stress field around a notch in a coarse grained Mg AZ31 sample has been measured under tensile load using the individual grains as probes in an in situ high energy synchrotron diffraction experiment. The experimental set-up, a variant of three-dimensional X-ray diffraction microscopy, allows the position, orientation and full stress tensor of each illuminated grain to be determined and, hence, enables the study of evolving stress fields in coarse grained materials with a spatial resolution equal to the grain size. Grain resolved information like this is vital for understanding what happens when the traditional continuum mechanics approach breaks down and fracture is governed by local heterogeneities (e.g. phase or stress differences) between grains. As a first approximation the results obtained were averaged through the thickness of the sample and compared with an elastic–plastic continuum finite element simulation. It was found that a full three-dimensional simulation was required to account for the measured transition from the overall plane stress case away from the notch to the essentially plane strain case observed near the notch tip. The measured and simulated stress contours were shown to be in good agreement except at the highest applied load, at which stress relaxation at the notch tip was observed in the experimental data. This stress relaxation is attributed to the initiation and propagation of a crack. Finally, it was demonstrated that the measured lattice rotations could be used as a qualitative measure of the shape and extent of the plastic deformation zone.

General information
State: Published
Organisations: Department of Physics, Composites and Materials Mechanics, Department of Wind Energy, Technische Universität Berlin, Argonne National Laboratory
Authors: Oddershede, J. (Intern), Camin, B. (Ekstern), Schmidt, S. (Intern), Mikkelsen, L. P. (Intern), Sørensen, H. O. (Intern), Lienert, U. (Ekstern), Poulsen, H. F. (Intern), Reimers, W. (Ekstern)
Pages: 3570-3580
Publication date: 2012
Main Research Area: Technical/natural sciences

Publication information
Journal: Acta Materialia
Volume: 60
ISSN (Print): 1359-6454
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.67 SJR 3.283 SNIP 2.674
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 3.542 SNIP 2.927 CiteScore 5.22
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 4.045 SNIP 3.348 CiteScore 5.16
Web of Science (2014): Indexed yes
Multigrain crystallography
We summarize exploratory work on multigrain crystallography. The experimental arrangement comprises a monochromatic beam, a fully illuminated sample with up to several hundred grains in transmission geometry on a rotary table and a 2D detector. Novel algorithms are presented for indexing, integration and filtering with emphasis on handling the complications of spot overlap and the need for on-line analysis. The structure solution and refinement steps are performed by conventional single crystal programs. Simulations are used to verify the algorithms and to probe the overall limitations of the methodology in terms of number of grains, size of unit cell and direct space resolution. First experimental results in the fields of chemistry, structural biology and time-resolved studies in photochemistry are presented. As an outlook, the concept of TotalCrystallography is introduced, defined as the simultaneous characterization of the 3D atomic, and 3D grain-scale structure of polycrystalline specimens with phases of unknown composition and structure.
The three dimensional X-ray diffraction technique
This introductory tutorial describes the so called 3 dimensional X-ray diffraction (3DXRD) technique, which allows bulk non-destructive structural characterizations of crystalline materials. The motivations and history behind the development of this technique are described and its potentials are sketched. Examples of the use of the technique are given and future trends and developments are suggested. The primary aim of the paper is to give 3DXRD novices an easy introduction to the technique and to describe a way from a dream to reality and new results.

General information
State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics, Department of Wind Energy, Materials science and characterization
Authors: Juul Jensen, D. (Intern), Poulsen, H. F. (Intern)
Pages: 1-7
Publication date: 2012
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Characterization
Volume: 72
ISSN (Print): 1044-5803
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.75 SJR 1.24 SNIP 1.54
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.242 SNIP 1.606 CiteScore 2.61
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.373 SNIP 2.025 CiteScore 2.47
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.183 SNIP 1.79 CiteScore 2.31
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.227 SNIP 2.063 CiteScore 2.26
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.132 SNIP 2.21 CiteScore 2.13
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.231 SNIP 1.767
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.002 SNIP 1.541
X-ray diffraction contrast tomography (DCT) system, and an X-ray diffraction contrast tomography (DCT) method
Source: US2012008736A An X-ray diffraction contrast tomography system (DCT) comprising a laboratory X-ray source (2), a staging device (5) rotating a polycrystalline material sample in the direct path of the X-ray beam, a first X-ray detector (6) detecting the direct X-ray beam being transmitted through the crystalline material sample, a second X-ray detector (7) positioned between the staging device and the first X-ray detector for detecting diffracted X-ray beams, and a processing device (15) for analysing detected values. The crystallographic grain orientation of the individual grain in the polycrystalline sample is determined based on the two-dimensional position of extinction spots and the associated angular position of the sample for a set of extinction spots pertaining to the individual grain.

General information
State: Published
Organisations: Department of Physics, Neutrons and X-rays for Materials Physics, Department of Energy Conversion and Storage, Imaging and Structural Analysis
Authors: Poulsen, H. F. (Intern), Lauridsen, E. M. (Intern)
Publication date: 2012

Publication information
Country: Denmark
IPC: G01N23/083
Patent number: WO2012003839
Date: 12/01/2012
Original language: English

Bibliographical note
DTU reference number: 92676-11
Main Research Area: Technical/natural sciences
Publication: Research - Patent – Annual report year: 2012

3D grain orientation mapping in the transmission electron microscope
General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Tsinghua University
Authors: Liu, H. (Ekstern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Godfrey, A. (Ekstern), Liu, Z. (Ekstern), Sharon, J. (Ekstern), Huang, X. (Intern)
Publication date: 2011
Main Research Area: Technical/natural sciences
3D grain orientation mapping of polycrystals on scales from 1 mm to 1 nm using 3D-XRD and TEM

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Tsinghua University
Authors: Huang, X. (Intern), Poulsen, H. F. (Intern), Schmidt, S. (Intern), Godfrey, A. (Ekstern)
Publication date: 2011
Main Research Area: Technical/natural sciences
Electronic versions:
3d grain.pdf
Source: orbit
Source-ID: 313981
Publication: Research › Conference abstract for conference – Annual report year: 2011

Evolution of dislocation structures following a change in loading conditions studied by in situ high resolution reciprocal space mapping

This thesis presents the results of a study aimed at investigating the evolution of dislocation structures in individual grains in copper polycrystals following a strain path change or a change in temperature. Copper samples were pre-deformed in tension to a strain of 5% at room temperature or to a strain of 7% at a temperature of -196 °C, and the samples were characterized by electron microscopy and mechanical tests. Transmission electron microscopy showed that the pre-deformation produced a characteristic dislocation cell structure consisting of regions with relatively high dislocation density, called dislocation walls, enclosing regions with very low dislocation density, called subgrains. The mechanical tests showed that a tension-tension strain path change leads to an increase in the yield stress if the change in strain path is sufficiently severe, and to a transient phase with a reduced work hardening rate.

The main part of the study consisted of a number of X-ray diffraction experiments in which the pre-deformed samples were further deformed in tension in situ at the APS synchrotron (the Advanced Photon Source at Argonne National Laboratory), for some samples along an axis different from the pre-deformation axis. In the X-ray diffraction experiments a technique was employed with which it is possible to obtain high-resolution reciprocal space maps from individual bulk grains. The high-resolution reciprocal space maps contain features related to the dislocation structure in the grains: A spread-out 'cloud' of low intensity caused by diffraction from the dislocation walls and a number of sharp peaks of high intensity caused by diffraction from the individual subgrains. By acquiring reciprocal space maps at a number of different strain levels the evolution of the dislocation structures can be studied, and by analyzing the sharp peaks information about the strain in the individual subgrains and about the intra-granular stresses can be obtained. For the analysis of the reciprocal space maps a mathematical method was developed to partition the intensity distribution into two components corresponding to the contributions from the subgrains and the walls.

The analysis showed that the morphology of the dislocation structures is almost unchanged during the micro-plastic range of the in situ deformation, and during the macroplastic range the evolution occurs in a gradual manner without any sudden major changes and with no indications that intermittent dynamics plays a major role in the evolution of the dislocation structures.

An analysis of the position of the radial profiles from the individual subgrains revealed a substantial variation in the elastic back-strain in the subgrains and showed that the distribution of the elastic back-strain in the subgrains can be well approximated by a Gauss distribution. Furthermore, it was found that on average the elastic back-strain is larger in the larger subgrains than in the smaller subgrains. The analysis also showed that, following a strain path change, the intra-granular stresses are substantially redistributed during the micro-plastic range. In a few individual subgrains it was possible to follow the evolution of the elastic back-strain from the tensile to the compressive case. Following an increase in temperature from -196 °C to room temperature, both the average intra-granular stress and the variation in the intra-granular stresses go through an initial phase of decrease or stagnation. An analysis of the width of the radial profiles from the individual subgrains showed that the dislocation density in the subgrains remains constant at a low level during the deformation.

Finally, an analysis of the radial profiles from the individual grains indicated that a change in loading conditions leads to a less ordered dislocation structure in the walls.
Grain-resolved elastic strains in deformed copper measured by three-dimensional X-ray diffraction

This X-ray diffraction study reports the grain-resolved elastic strains in about 1000 randomly oriented grains embedded in a polycrystalline copper sample. Diffraction data were collected in situ in the undeformed state and at a plastic strain of 1.5% while the sample was under tensile load. For each grain the centre-of-mass position was determined with an accuracy of 10 μm, the volume with a relative error of 20%, the orientation to 0.05° and the axial strain to 10⁻⁴. The elastic strain along the tensile direction exhibited a grain orientation dependence with grains within 20° of carrying the largest strain. While the width of the strain distribution for all grains did not change upon plastic loading, the grain-resolved data show a significant widening of the distribution evaluated for small subsets of initially elastically similar grains. This widening appears independent of the grain orientation.
Measuring the stress field around an evolving crack in tensile deformed Mg AZ31 using 3DXRD grain centre mapping

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Composites and Materials Mechanics
Authors: Oddershede, J. (Intern), Camin, B. (Ekstern), Schmidt, S. (Intern), Mikkelsen, L. P. (Intern), Sørensen, H. O. (Intern), Lienert, U. (Intern), Poulsen, H. F. (Intern), Reimers, W. (Ekstern)
Publication date: 2011
Event: Abstract from MECASENS VI, Hamburg (DE), Sep. 
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 285479
Publication: Research › Conference abstract for conference – Annual report year: 2011

Measuring the stress field around an evolving crack in tensile deformed Mg AZ31 using 3DXRD grain centre mapping

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Composites and Materials Mechanics
Authors: Oddershede, J. (Intern), Camin, B. (Ekstern), Schmidt, S. (Intern), Mikkelsen, L. P. (Intern), Sørensen, H. O. (Intern), Lienert, U. (Intern), Poulsen, H. F. (Intern), Reimers, W. (Ekstern)
Publication date: 2011
Event: Abstract from Workshop to promote the use of high-energy X-ray diffraction experiments and detailed computational analyses for understanding multiscale phenomena in crystalline materials, APS, Chicago (US), Oct. 
Main Research Area: Technical/natural sciences
Materials characterization and modelling
Source: orbit
Source-ID: 285481
Publication: Research › Conference abstract for conference – Annual report year: 2011
On the Use of Laguerre Tessellations for Representations of 3D Grain Structures

Accurate descriptions of 3D grain structures in polycrystalline materials are of key interest as the grain structure is closely correlated to the macroscopic properties of the material. In the present study, we investigate the accuracy of using Laguerre tessellations to represent 3D grain structures from only the spatial center of mass location and the volume of the grains. The ability of Laguerre tessellations to describe accurate grain shapes and topologies of real 3D grain structures are revealed by direct comparison to 3D reconstructions of an un-deformed meta-stable β -titanium alloy obtained by phase-contrast micro-tomography. This study reveals that (volume weighted) Laguerre tessellations are superior to classical Voronoi tessellations when it comes to providing accurate representations of real 3D grain structures.

Furthermore, although the Laguerre tessellations were only able to correctly describe the local arrangements of grains (i.e., the grain neighbors and number of grain facets) for 31.8% of the investigated grains, the Laguerre tessellations were able to accurately describe statistical grain characteristics such as grain size distributions and grain neighbor distributions.

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Rise National Laboratory for Sustainable Energy, European Synchrotron Radiation Facility, Naval Research Laboratory
Pages: 165-170
Publication date: 2011
Main Research Area: Technical/natural sciences

Publication information
Journal: Advanced Engineering Materials
Volume: 13
Issue number: 3
ISSN (Print): 1438-1656
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.07 SJR 0.826 SNIP 1.083
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.807 SNIP 1.045 CiteScore 1.82
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.805 SNIP 1.089 CiteScore 1.66
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.733 SNIP 0.843 CiteScore 1.59
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.779 SNIP 0.959 CiteScore 1.46
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.828 SNIP 1.035 CiteScore 1.58
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.097 SNIP 1.14
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.283 SNIP 1.106
BFI (2008): BFI-level 1
Simultaneous X-ray diffraction from multiple single crystals of macromolecules

The potential in macromolecular crystallography for using multiple crystals to collect X-ray diffraction data simultaneously from assemblies of up to seven crystals is explored. The basic features of the algorithms used to extract data and their practical implementation are described. The procedure could be useful both in relation to diffraction data obtained from intergrown crystals and to alleviate the problem of rapid diffraction decay arising from the effects of radiation damage.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Metal Structures in Four Dimensions, Materials Research Division, University of Oxford, European Synchrotron Radiation Facility
Authors: Paithankar, K. S. (Ekstern), Sørensen, H. O. (Intern), Wright, J. P. (Ekstern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Garman, E. F. (Ekstern)
Pages: 608-618
Publication date: 2011
Main Research Area: Technical/natural sciences

Publication information
Journal: Acta Crystallographica. Section D: Biological Crystallography
Volume: 67
ISSN (Print): 0907-4449
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 2.894 SNIP 0.993 CiteScore 2.74
Scopus rating (2015): SJR 3.039 SNIP 1.278
Scopus rating (2014): SJR 6.245 SNIP 2.505
Web of Science (2014): Indexed yes
Scopus rating (2013): SJR 20.236 SNIP 5.001
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
ISI indexed (2012): ISI indexed yes
Three-Dimensional Orientation Mapping in the Transmission Electron Microscope

Over the past decade, efforts have been made to develop nondestructive techniques for three-dimensional (3D) grain-orientation mapping in crystalline materials. 3D x-ray diffraction microscopy and differential-aperture x-ray microscopy can now be used to generate 3D orientation maps with a spatial resolution of 200 nanometers (nm). We describe here a nondestructive technique that enables 3D orientation mapping in the transmission electron microscope of mono- and multiphase nanocrystalline materials with a spatial resolution reaching 1 nm. We demonstrate the technique by an experimental study of a nanocrystalline aluminum sample and use simulations to validate the principles involved.

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Tsinghua University, Chinese Academy of Sciences, Johns Hopkins University
Authors: Liu, H. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Godfrey, A. (Ekstern), Liu, Z. (Ekstern), Sharon, J. (Ekstern), Huang, X. (Intern)
Pages: 833-834
Publication date: 2011
Main Research Area: Technical/natural sciences

Publication information
Journal: Science
Volume: 332
Issue number: 6031
ISSN (Print): 0036-8075
Ratings:
BFI (2018): BFI-level 3
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
3D grain reconstruction from Boxscan data

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Naval Research Laboratory, Brookhaven National Laboratory, Ruhr-University Bochum, University of Copenhagen, European Synchrotron Radiation Facility
Authors: Lyckegaard, A. (Intern), Alpers, A. (Intern), Ludwig, W. (Ekstern), Fonda, R. (Ekstern), Margulies, L. (Ekstern), Götz, A. (Ekstern), Sørensen, H. (Ekstern), Dey, S. (Ekstern), Poulsen, H. F. (Intern), Lauridsen, E. M. (Intern)
Pages: 329-336
Publication date: 2010
Conference: 31st Risø International Symposium on Materials Science: Challenges in materials science and possibilities in 3D and 4D characterization techniques, Roskilde, Denmark, 06/09/2010 - 06/09/2010
Main Research Area: Technical/natural sciences

Publication information
Volume: 31
ISSN (Print): 0907-0079
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
BFI (2015): BFI-level 1
BFI (2014): BFI-level 1
BFI (2013): BFI-level 1
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 1
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 1
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
BFI (2009): BFI-level 1
BFI (2008): BFI-level 1
Original language: English
Materials characterization and modelling, Materials and energy storage
Source: orbit
Source-ID: 266631
Publication: Research - peer-review › Conference article – Annual report year: 2010

3DXRD measurements of lattice rotations in tensile deformed IF steel

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, European Synchrotron Research Facility
Authors: Oddershede, J. (Intern), Wright, J. (Ekstern), Margulies, L. (Intern), Huang, X. (Intern), Poulsen, H. F. (Intern), Schmidt, S. (Intern), Winther, G. (Intern)
Pages: 369-374
Publication date: 2010
Conference: 31st Risø International Symposium on Materials Science: Challenges in materials science and possibilities in 3D and 4D characterization techniques, Roskilde, Denmark, 06/09/2010 - 06/09/2010
Main Research Area: Technical/natural sciences

Publication information
Volume: 31
ISSN (Print): 0907-0079
Ratings:
BFI (2018): BFI-level 1
4D characterization of metals by 3DXRD

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division, Metal Structures in Four Dimensions, European Synchrotron Radiation Facility
Pages: 101-119
Publication date: 2010
Conference: 31st Risø International Symposium on Materials Science : Challenges in materials science and possibilities in 3D and 4D characterization techniques, Roskilde, Denmark, 06/09/2010 - 06/09/2010
Main Research Area: Technical/natural sciences

Publication information
Volume: 31
ISSN (Print): 0907-0079
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
BFI (2015): BFI-level 1
BFI (2014): BFI-level 1
BFI (2013): BFI-level 1
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 1
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 1
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
BFI (2009): BFI-level 1
BFI (2008): BFI-level 1
Original language: English
Materials characterization and modelling, Materials and energy storage
Source: orbit
Source-ID: 266626
Advances in characterization of deformation structures by high resolution reciprocal space mapping

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division, Metal Structures in Four Dimensions, Argonne National Laboratory
Pages: 79-100
Publication date: 2010
Conference: 31st Risø International Symposium on Materials Science: Challenges in materials science and possibilities in 3D and 4D characterization techniques, Roskilde, Denmark, 06/09/2010 - 06/09/2010
Main Research Area: Technical/natural sciences

Publication information
Volume: 31
ISSN (Print): 0907-0079
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
BFI (2015): BFI-level 1
BFI (2014): BFI-level 1
BFI (2013): BFI-level 1
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 1
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 1
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
BFI (2009): BFI-level 1
BFI (2008): BFI-level 1
Original language: English
Materials characterization and modelling, Materials and energy storage
Electronic versions:
Pantleon_ADVANCES IN CHARACTERIZATION.pdf
Source: orbit
Source-ID: 266625
Publication: Research - peer-review » Conference article – Annual report year: 2010

A new principle of orientation determination for 3D electron diffraction microscopy

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Rise National Laboratory for Sustainable Energy, Tsinghua University
Authors: Liu, H. (Intern), Poulsen, H. F. (Intern), Schmidt, S. (Intern), Sørensen, H. O. (Intern), Godfrey, A. (Ekstern), Huang, X. (Intern)
Pages: 311-316
Publication date: 2010
Conference: 31st Risø International Symposium on Materials Science: Challenges in materials science and possibilities in 3D and 4D characterization techniques, Roskilde, Denmark, 06/09/2010 - 06/09/2010
Main Research Area: Technical/natural sciences

Publication information
Volume: 31
ISSN (Print): 0907-0079
Ratings:
Challenges in materials science and possibilities in 3D and 4D characterization techniques. Proceedings of the 31st Risø International Symposium on Materials Science

DART: a robust algorithm for fast reconstruction of three-dimensional grain maps

A novel algorithm is introduced for fast and nondestructive reconstruction of grain maps from X-ray diffraction data. The discrete algebraic reconstruction technique (DART) takes advantage of the intrinsic discrete nature of grain maps, while being based on iterative algebraic methods known from classical tomography. To test the properties of the algorithm, three-dimensional X-ray diffraction microscopy data are simulated and reconstructed with DART as well as by a conventional iterative technique, namely SIRT (simultaneous iterative reconstruction technique). For 100 × 100 pixel reconstructions and moderate noise levels, DART is shown to generate essentially perfect two-dimensional grain maps for as few as three projections per grain with running times on a PC in the range of less than a second. This is seen as opening up the possibility for fast reconstructions in connection with in situ studies.
Determining grain resolved stresses in polycrystalline materials using three-dimensional X-ray diffraction

An algorithm is presented for characterization of the grain resolved (type II) stress states in a polycrystalline sample based on monochromatic X-ray diffraction data. The algorithm is a robust 12-parameter-per-grain fit of the centre-of-mass grain positions, orientations and stress tensors including error estimation and outlier rejection. The algorithm is validated by simulations and by two experiments on interstitial free steel. In the first experiment, using only a far-field detector and a rotation range of $2 \times 110^\circ$, 96 grains in one layer were monitored during elastic loading and unloading. Very consistent results were obtained, with mean resolutions for each grain of approximately 10 µm in position, 0.05° in orientation, and 8, 20 and 13 × 10$^{-5}$ in the axial, normal and shear components of the strain, respectively. The corresponding mean deviations in stress are 30, 50 and 15 MPa in the axial, normal and shear components, respectively, though some grains may have larger errors. In the second experiment, where a near-field detector was added, ~ 2000 grains were characterized with a positional accuracy of 3 µm.
Grain resolved stresses in polycrystalline materials from 3DXRD data

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Oddershede, J. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Reimers, W. (Ekstern)
Publication date: 2010
Event: Abstract from 8th European Conference on Residual Stresses, Riva del Garda (IT), 26-28 Jun, .
Main Research Area: Technical/natural sciences
Materials characterization and modelling, Materials and energy storage
Source: orbit
Source-ID: 261892
Publication: Research - peer-review › Journal article – Annual report year: 2010

Mapping the stresses of individual grains in a polycrystalline material using 3DXRD

General information
State: Published
Measuring type II stresses using 3DXRD

An algorithm is presented for characterization of the grain resolved (type II) stress states in a polycrystalline sample based on monochromatic X-ray diffraction data. The algorithm is a robust 12-parameter-per-grain fit of the centre-of-mass grain positions, orientations and stress tensors including error estimation and outlier rejection. As examples of use results from two experiments – one on interstitial free (IF) steel and one on copper – will be presented. In the first experiment 96 grains in one layer of IF steel were monitored during elastic loading and unloading. Very consistent results were obtained, with resolutions for each grain of approximately 10 μm in position, 0.05˚ in orientation and 80 μstrain. When averaging over all grains a resolution of 10 μstrain was obtained. In the second experiment it was demonstrated that the strain states of more than 1000 grains in a plastically deformed Cu specimen could be determined to an accuracy of 100 μstrain.
Web of Science (2010): Indexed yes  
BFI (2009): BFI-level 1  
Scopus rating (2009): SNIP 0.389 SJR 0.343  
BFI (2008): BFI-level 1  
Scopus rating (2008): SJR 0.297 SNIP 0.358  
Web of Science (2008): Indexed yes  
Scopus rating (2007): SJR 0.314 SNIP 0.5  
Web of Science (2007): Indexed yes  
Scopus rating (2006): SJR 0.37 SNIP 0.511  
Web of Science (2006): Indexed yes  
Scopus rating (2005): SJR 0.41 SNIP 0.56  
Web of Science (2005): Indexed yes  
Scopus rating (2004): SJR 0.449 SNIP 0.575  
Web of Science (2004): Indexed yes  
Scopus rating (2003): SNIP 0.548 SJR 0.457  
Web of Science (2003): Indexed yes  
Scopus rating (2002): SNIP 0.514 SJR 0.432  
Web of Science (2002): Indexed yes  
Scopus rating (2001): SNIP 0.524 SJR 0.403  
Web of Science (2001): Indexed yes  
Scopus rating (2000): SNIP 0.549 SJR 0.49  
Web of Science (2000): Indexed yes  
Scopus rating (1999): SNIP 0.526 SJR 0.548  
Original language: English  
Materials characterization and modelling, Materials and energy storage  
DOIs:  
10.4028/www.scientific.net/MSF.652.63  
Source: orbit  
Source-ID: 253771  
Publication: Research - peer-review › Conference article – Annual report year: 2010

**Measuring type-II stresses using 3XRD**

**General information**

State: Published  
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Rise National Laboratory for Sustainable Energy, Technische Universität Berlin  
Authors: Oddershede, J. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Reimers, W. (Ekstern)  
Publication date: 2010  
Event: Poster session presented at German Conference for Research with Synchrogron Radiation, Neutrons and Ion Beams at Large Facilities, Berlin (DE), 24-26 Feb.,  
Main Research Area: Technical/natural sciences  
Materials characterization and modelling, Materials and energy storage  
Source: orbit  
Source-ID: 261898  
Publication: Research › Poster – Annual report year: 2010

**Phase retrieval for superposed signals from multiple binary objects**

We introduce the binary superposed phase retrieval problem that aims at reconstructing multiple 0/1-valued functions with nonoverlapping bounded supports from moduli of superpositions of several displaced copies of their individual Fourier transforms. We discuss an application in coherent diffraction imaging of crystalline objects, propose two algorithms, and evaluate their performance by means of simulations. © 2010 Optical Society of America

**General information**

State: Published  
Organisations: Rise National Laboratory for Sustainable Energy, Metal Structures in Four Dimensions, Materials Research Division, City College of New York  
Authors: Alpers, A. (Intern), Herman, G. T. (Ekstern), Poulsen, H. F. (Intern), Schmidt, S. (Intern)  
Pages: 1927-1937
The extension of ID11 for nanoscale and hierarchical characterization

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Brookhaven National Laboratory, European Synchrotron Radiation Facility
Pages: 457-476
Publication date: 2010
Conference: 31st Risø International Symposium on Materials Science : Challenges in materials science and possibilities in 3D and 4D characterization techniques, Roskilde, Denmark, 06/09/2010 - 06/09/2010
Main Research Area: Technical/natural sciences
4D studies in materials science

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. F. (Intern)
Publication date: 2009
Main Research Area: Technical/natural sciences
Materials characterization and modelling, Materials research
Source: orbit
Source-ID: 256897
Publication: Research - peer-review › Conference article – Annual report year: 2010

A discrete spherical X-ray transform of orientation distribution functions using bounding cubes
We investigate a cubed sphere parametrization of orientation space with the aim of constructing a discrete voxelized version of the spherical x-ray transform. For tracing the propagation of a unit great circle through the partition subsets, the frustums of the cubed sphere, a fast procedure is proposed. The circle's parts in each frustum are gnomonically mapped into line segments inside the bounding cubes. The line segments constitute a convex polygon with vertexes indicating frustum exit–entry points. Thus the problem of system matrix calculation is reduced to the tracing of line segments within rectangular voxel arrays partitioning the bounding cubes. Hence algebraic reconstruction techniques can be used in a comprehensive way for orientation distribution function estimation from diffraction data.

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Kazantsev, I. G. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern)
Pages: 105009
Publication date: 2009
Main Research Area: Technical/natural sciences

Publication information
Journal: Inverse Problems
Volume: 25
Issue number: 10
ISSN (Print): 0266-5611
Ratings:
A greedy method for reconstructing polycrystals from three-dimensional X-ray diffraction data

An iterative search method is proposed for obtaining orientation maps inside polycrystals from three-dimensional X-ray diffraction (3DXRD) data. In each step, detector pixel intensities are calculated by a forward model based on the current estimate of the orientation map. The pixel at which the experimentally measured value most exceeds the simulated one is identified. This difference can only be reduced by changing the current estimate at a location from a relatively small subset of all possible locations in the estimate and, at each such location, an increase at the identified pixel can only be achieved by changing the orientation in only a few possible ways. The method selects the location/orientation pair indicated as best by a function that measures data consistency combined with prior information on orientation maps. The superiority of the method to a previously published forward projection Monte Carlo optimization is demonstrated on simulated data.
Closing the gap between single crystal and powder diffraction

**General information**

State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Sørensen, H. O. (Intern), Schmidt, S. (Intern), Wright, J. (Ekstern), Hansen, P. C. (Intern), Poulsen, H. F. (Intern)
Publication date: 2009
Main Research Area: Technical/natural sciences

Computer simulation of electron nanodiffraction patterns from overlapping grains

**General information**

State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Hiroshima University
Authors: Sugio, K. (Ekstern), Liu, H. (Intern), Poulsen, H. F. (Intern), Huang, X. (Intern)
Pages: 337-342
Publication date: 2009
Main Research Area: Technical/natural sciences

**Publication information**

Volume: 30
ISSN (Print): 0907-0079
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
BFI (2015): BFI-level 1
BFI (2014): BFI-level 1
BFI (2013): BFI-level 1
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 1
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 1
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
BFI (2009): BFI-level 1
BFI (2008): BFI-level 1
Original language: English
Materials characterization and modelling, Materials research
Source: orbit
Source-ID: 249788
Publication: Research - peer-review » Conference article – Annual report year: 2009
Direct non-destructive observation of bulk nucleation in 30% deformed aluminum

A 30% deformed aluminum sample was mapped non-destructively using three-dimensional X-ray diffraction (3DXRD) before and after annealing to nucleation of recrystallization. Nuclei appeared in the bulk of the sample. Their positions and volumes were determined, and the crystallographic orientations were compared with the orientations of the deformed grains. It was found that nuclei with new orientations can form and their orientations have been related to the dislocation structure in the deformed grains.

General information
State: Published
Pages: 875-878
Publication date: 2009
Main Research Area: Technical/natural sciences

Publication information
Journal: Scripta Materialia
Volume: 61
ISSN (Print): 1359-6462
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.71 SJR 1.901 SNIP 1.696
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.3 SNIP 1.876 CiteScore 3.54
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.744 SNIP 2.124 CiteScore 3.55
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.347 SNIP 1.975 CiteScore 3.19
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.309 SNIP 2.022 CiteScore 3.01
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 2.333 SNIP 2.108 CiteScore 3.21
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.445 SNIP 2.125
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 2.574 SNIP 2.02
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.634 SNIP 2.128
Web of Science (2008): Indexed yes
With high angular resolution three-dimensional X-ray diffraction, individual subgrains are traced in the bulk of a polycrystalline specimen and their dynamics is followed in situ during varying loading conditions. The intensity distribution of single Bragg reflections from an individual grain is analyzed in reciprocal space. It consists of sharp high-intensity peaks arising from subgrains superimposed on a cloud of lower intensity arising from dislocation walls. Individual subgrains can be distinguished by their unique combination of orientation and elastic strain. The responses of polycrystalline copper to different loading conditions are presented: during uninterrupted tensile deformation, formation of subgrains can be observed concurrently with broadening of the Bragg reflection shortly after onset of plastic deformation. With continued tensile deformation, the subgrain structure develops intermittently. When the traction is terminated, stress relaxation occurs and number, size and orientation of subgrains are found to be constant. The subgrain structure freezes and only a minor clean-up of the dislocation structure is observed. When changing the tensile direction after pre-deformation in tension, a systematic correlation between the degree of strain path change and the changes in the dislocation structure quantified by the volume fraction of the subgrains is established. For obtaining the subgrain volume fraction, a new fitting method has been developed for partitioning the contributions of subgrains and dislocation walls.
Evolution of Deformation Structures under Varying Loading Conditions Followed In-Situ by High Angular Resolution 3DXRD

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division, Metal Structures in Four Dimensions, Argonne National Laboratory, Roskilde University
Authors: Pantleon, W. (Intern), Weidemann, C. (Ekstern), Lienert, U. (Ekstern), Jakobsen, B. (Ekstern), Poulsen, H. F. (Intern)
Number of pages: 412
Pages: 69-69
Publication date: 2009

Host publication information
Title of host publication: Technical Program
Publisher: TMS
Main Research Area: Technical/natural sciences
Materials characterization and modelling, Materials research
Source: orbit
Source-ID: 254899
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2009

Integrated intensities based on grain orientation distribution functions

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Sørensen, H. O. (Intern), Wright, J. (Ekstern), Schmidt, S. (Intern), Hansen, P. C. (Intern), Poulsen, H. F. (Intern)
Publication date: 2009
Main Research Area: Technical/natural sciences
Materials characterization and modelling, Materials research
Source: orbit
Source-ID: 245306
Publication: Research › Paper – Annual report year: 2009

Mapping the elastic strains of individual grains in a polycrystalline material using 3DXRD

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Oddershede, J. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Sørensen, H. O. (Intern), Reimers, W. (Ekstern)
Publication date: 2009
Main Research Area: Technical/natural sciences
Materials characterization and modelling, Materials research
Source: orbit
Source-ID: 245919
Publication: Research › Conference abstract for conference – Annual report year: 2009

Mapping the elastic strains of individual grains in a polycrystalline material using 3DXRD

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Oddershede, J. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Sørensen, H. O. (Intern), Reimers, W. (Ekstern)
Publication date: 2009
Event: Abstract from 39th Danish Crystallographer Meeting and 2nd DanScatt Annual Meeting, Lyngby, Denmark.
Measuring residual stresses of individual grains in polycrystalline materials using 3DXRD

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Oddershede, J. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Reimers, W. (Ekstern)
Publication date: 2009
Main Research Area: Technical/natural sciences
Materials characterization and modelling, Materials research
Source: orbit
Source-ID: 245917
Publication: Research › Conference abstract for conference – Annual report year: 2009

Measuring the elastic strain of individual grains in a polycrystalline material - extending a micro-scale technique to the nano-regime

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, European Synchrotron Research Facility, Max Planck Institute, Technische Universität Berlin
Authors: Oddershede, J. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Margulies, L. (Intern), Wright, J. (Ekstern), Moseicki, M. (Ekstern), Reimers, W. (Ekstern)
Pages: 277-283
Publication date: 2009
Main Research Area: Technical/natural sciences
Publication information
Volume: 30
ISSN (Print): 0907-0079
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
BFI (2015): BFI-level 1
BFI (2014): BFI-level 1
BFI (2013): BFI-level 1
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 1
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 1
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
BFI (2009): BFI-level 1
BFI (2008): BFI-level 1
Original language: English
Materials characterization and modelling, Materials research
Source: orbit
Source-ID: 249784
Publication: Research - peer-review › Conference article – Annual report year: 2009
Measuring the elastic strain of individual grains in polycrystalline materials

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Metal Structures in Four Dimensions, Materials Research Division
Authors: Oddershede, J. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Sørensen, H. O. (Intern), Reimers, W. (Ekstern)
Publication date: 2009

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Materials characterization and modelling, Materials research
Electronic versions:
2009_74.pdf
Source: orbit
Source-ID: 245912
Publication: Research › Sound/Visual production (digital) – Annual report year: 2009

Measuring the elastic strain of individual grains in polycrystalline materials
3DXRD is not only an excellent tool when it comes to non-destructively determining the positions and orientations of individual grains within the bulk of a polycrystalline material, the experiment can also provide grain resolved elastic strain tensors. To extract this information the program FitAllB, which fits centre-of-mass grain positions, orientations and strain tensors from the experimental far-field 3DXRD data, was developed. The program builds on peaksearch, ImageD11 and GrainSpotter and will eventually be implemented in the Fable GUI. By the use of simulated data the presentation will focus on some of the important aspects you have to take into account in order to determine the strain tensors of the individual grains to the desired accuracy of 10^-4. The first thing is how to handle the peak overlaps that will inevitably occur, especially for textured and/or deformed materials. Secondly a careful calibration of the global parameters relating to the experiment (sample-to-detector distance, tilts of detector and sample and beam centre on detector) must be performed. For this purpose the option of fitting the global parameters simultaneously for any number of indexed grains is included in FitAllB. Finally some examples of applying FitAllB to analyze experimental 3DXRD data will be shown. These will include an experiment performed using both a near- and a far-field detector, thus making it possible to improve the grain positions by fitting these against the near-field data. Again this can be done within FitAllB. In addition to the centre-of-mass grain positions, orientations and strain tensors, FitAllB also calculates the relative volumes of the grains based on the peak intensities, so using a tessellation routine a crude 3D map of the elastic strain in the polycrystal can be obtained.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Metal Structures in Four Dimensions, Materials Research Division
Authors: Oddershede, J. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Sørensen, H. O. (Intern), Reimers, W. (Ekstern)
Publication date: 2009

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Materials characterization and modelling, Materials research
Electronic versions:
2009_74.pdf
2009_74_1.pdf
Source: orbit
Source-ID: 245914
Publication: Research › Sound/Visual production (digital) – Annual report year: 2009

Multigrain crystallography - why bother?

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Metal Structures in Four Dimensions, Materials Research Division

New opportunities for 3D materials science of polycrystalline materials at the micrometre lengthscale by combined use of X-ray diffraction and X-ray imaging

Non-destructive, three-dimensional (3D) characterization of the grain structure in mono-phase polycrystalline materials is an open challenge in material science. Recent advances in synchrotron based X-ray imaging and diffraction techniques offer interesting possibilities for mapping 3D grain shapes and crystallographic orientations for certain categories of polycrystalline materials. Direct visualisation of the three-dimensional grain boundary network or of two-phase (duplex) grain structures by means of absorption and/or phase contrast techniques may be possible, but is restricted to specific material systems. A recent extension of this methodology, termed X-ray diffraction contrast tomography (DCT), combines the principles of X-ray diffraction imaging, three-dimensional X-ray diffraction microscopy (3DXRD) and image reconstruction from projections. DCT provides simultaneous access to 3D grain shape, crystallographic orientation and local attenuation coefficient distribution. The technique applies to the larger range of plastically undeformed, polycrystalline mono-phase materials, provided some conditions on grain size and texture are fulfilled. The straightforward combination with high-resolution microtomography opens interesting new possibilities for the observation of microstructure related damage and deformation mechanisms in these materials.
Reconstruction of Single-Grain Orientation Distribution Functions for Crystalline Materials

A fundamental imaging problem in microstructural analysis of metals is the reconstruction of local crystallographic orientations from X-ray diffraction measurements. This work develops a fast, accurate, and robust method for the computation of the three-dimensional orientation distribution function for individual grains of the material in consideration.

We study two iterative large-scale reconstruction algorithms, the algebraic reconstruction technique (ART) and conjugate
gradients for least squares (CGLS), and demonstrate that right preconditioning is necessary in both algorithms to provide satisfactory reconstructions. Our right preconditioner is not a traditional one that accelerates convergence; its purpose is to modify the smoothness properties of the reconstruction. We also show that a new stopping criterion, based on the information available in the residual vector, provides a robust choice of the number of iterations for these preconditioned methods.

**General information**

State: Published
Organisations: Scientific Computing, Department of Informatics and Mathematical Modeling, Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Hansen, P. C. (Intern), Sørensen, H. O. (Intern), Sükösd, Z. (Intern), Poulsen, H. F. (Intern)
Pages: 593-613
Publication date: 2009
Main Research Area: Technical/natural sciences

**Publication information**

Journal: SIAM Journal of Imaging Sciences
Volume: 2
Issue number: 2
ISSN (Print): 1936-4954

**Ratings:**

BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.5 SJR 1.824 SNIP 1.789
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.812 SNIP 2.258 CiteScore 3.64
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.481 SNIP 2.478 CiteScore 3.28
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.863 SNIP 3.523 CiteScore 5.05
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.174 SNIP 3.985 CiteScore 4.26
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 0.899 SNIP 1.467 CiteScore 2.17
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 2
BFI (2009): BFI-level 2
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Original language: English

**materials science, Materials characterization and modelling, stopping criterion, preconditioning, regularizing iterations, orientation distribution function,, polycrystals**

**DOIs:**

10.1137/080726021

Source: orbit
Source-ID: 220577
Publication: Research - peer-review › Journal article – Annual report year: 2009

**Stability of dislocation structures in copper towards stress relaxation investigated by high angular resolution 3D X-ray diffraction**

A 300 µm thick tensile specimen of OFHC copper is subjected to a tensile loading sequence and deformed to a maximal strain of 3.11%. Using the novel three-dimensional X-ray diffraction method High angular resolution 3DXRD, the evolution of the microstructure within a deeply embedded grain is characterised in-situ by the behaviour of individual subgrains. The
loading sequence consists of three continuous deformation stages with strain rates of $1.1 \times 10^{-6}$ s$^{-1}$ and $3 \times 10^{-2}$ s$^{-1}$, in each case followed by a period of extended stress relaxation at fixed motor positions, as well as an unloading step. In contrast to the deformation stages, during each stress relaxation stage, number, size and orientation of subgrains are found to be constant, while a minor amount of clean-up of the microstructure is observed as narrowing of the radial X-ray diffraction line profile. The associated decrease in the width of the strain distribution indicates homogenization of the elastic strains present in the deformation structure. During reloading, the subgrain structure seemingly starts to develop further when the entire dislocation structure is deforming plastically. Upon unloading of the sample, the average backward strain of the subgrains increases. (© 2009 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim)
Structured scintillators for X-ray imaging with micrometre resolution

A 3D X-ray detector for imaging of 30–200 keV photons is described. It comprises a stack of semitransparent structured scintillators, where each scintillator is a regular array of waveguides in silicon, and with pores filled with CsI. The performance of the detector is described theoretically and explored in detail through simulations. The resolution of a single screen is shown to be determined only by the pitch, at least up to 100 keV. In comparison to conventional homogenous screens an improvement in efficiency by a factor 5–15 is obtainable. The cross-talk between screens in the 3D detector is shown to be negligible. The concept of such a 3D detector enables ray tracing and super resolution algorithms to be applied. Realized pore geometries have a lower aspect ratio than used in simulations and the roughness of the pore walls gives a 13% decrease in waveguide efficiency. Compared to currently used regular scintillators with similar resolution an efficiency increase by a factor 4 has been found for the structured scintillator.
The 3D X-ray microscope

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. F. (Intern)
Publication date: 2009
Main Research Area: Technical/natural sciences
Materials characterization and modelling, Materials research
Source: orbit
Source-ID: 248704
Publication: Research - peer-review › Journal article – Annual report year: 2009

The effect of strain path change on subgrain volume fraction determined from in situ X-ray measurements
The evolution of dislocation structures in individual bulk grains in copper during strain path changes is studied with a new in situ synchrotron technique which combines high angular resolution with fast three-dimensional reciprocal space mapping. Deformed copper contains regions with vanishing dislocation density called subgrains bounded by dislocation walls. With the new technique reciprocal space maps, consisting of sharp peaks arising from the subgrains superimposed on a cloud of lower intensity arising from the dislocation walls, are obtained, which allows properties such as subgrain volume fraction to be quantified. The studied strain path changes are tension-tension sequences.
Polycrystalline copper sheets are pre-deformed in tension to 5% strain, and tensile samples are cut with varying angles
between the first and second loading axis. The second tensile deformation up to additional 5% strain is performed in situ while mapping a selected X-ray reflection from one particular bulk grain with high angular resolution. The reciprocal space maps are analyzed with a recently developed fitting method, and a correlation is found between the evolution of the subgrain volume fraction and the degree of strain path change the sample is subjected to.

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Argonne National Laboratory
Authors: Wejdemann, C. (Intern), Poulsen, H. F. (Intern), Lienert, U. (Ekstern), Pantleon, W. (Intern)
Pages: 012003
Publication date: 2009
Main Research Area: Technical/natural sciences

Publication information
Journal: I O P Conference Series: Materials Science and Engineering
Volume: 3
ISSN (Print): 1757-8981
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.39 SJR 0.187 SNIP 0.499
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.172 SNIP 0.281 CiteScore 0.22
Scopus rating (2014): SJR 0.186 SNIP 0.306 CiteScore 0.18
Scopus rating (2013): SJR 0.183 SNIP 0.256 CiteScore 0.16
ISI indexed (2013): ISI indexed no
Scopus rating (2012): SJR 0.161 SNIP 0.203 CiteScore 0.14
ISI indexed (2012): ISI indexed no
Scopus rating (2011): SJR 0.155 SNIP 0.149 CiteScore 0.1
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 0.151 SNIP 0.112
Original language: English
Materials characterization and modelling, Materials research
DOIs: 10.1088/1757-899X/3/1/012003
Source: orbit
Source-ID: 253760
Publication: Research › Conference article – Annual report year: 2009

X-ray imaging methods for mapping orientations and strains in grains

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division, Metal Structures in Four Dimensions
Authors: Poulsen, H. F. (Intern)
Publication date: 2009
Event: Abstract from 5th International Conference on Mechanical Stress Evaluation by Neutrons and Synchrotron Radiation, Mito, Japan.
Main Research Area: Technical/natural sciences
Materials characterization and modelling, Materials research
Source: orbit
Source-ID: 254945
Publication: Research › Conference abstract for conference – Annual report year: 2009
A high-spatial-resolution three-dimensional detector array for 30-200 keV X-rays based on structured scintillators

A three-dimensional X-ray detector for imaging 30-200 keV photons is described. It comprises a set of semi-transparent structured scintillators, where each scintillator is a regular array of waveguides in silicon, and with pores filled with CsI. The performance of the detector is described theoretically and explored in detail through simulations. Based on available hardware, a spatial resolution of 1 mm is obtainable. The resolution of a single screen is shown to be determined only by the pitch, at least up to 100 keV. In comparison with conventional homogeneous screens, an improvement in efficiency by a factor of 5-15 is obtainable. The cross-talk between screens in the three-dimensional detector is shown to be negligible. The three-dimensional concept enables ray-tracing and super-resolution algorithms to be applied.

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. F. (Intern), Ludwig, W. (Ekstern), Schmidt, S. (Intern)
Number of pages: 460
Pages: 335-351
Publication date: 2008

Host publication information
Title of host publication: Neutrons and Synchrotron Radiation in Engineering Materials Science : From Fundamentals to Material and Component Characterization
Publisher: Wiley-VCH
Editors: Reimers, W., Pyzalla, A., Schreyer, A., Clemens, H.
ISBN (Print): 978-3-527-31533-8
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 234266
Publication: Research - peer-review › Book chapter – Annual report year: 2008
Direct observation of 3-D grain growth in Al-0.1% Mn

Grain growth in an Al-0.1% Mn sample has been measured non-destructively using a three-dimensional X-ray diffraction (3DXRD) microscope. The 3-D grain morphology as well as the crystallographic orientation was determined for 483 grains in the illuminated volume prior to annealing. After annealing, a second map revealed that significant grain growth had taken place, with only 27 remaining grains in the same volume. The correlation between grain orientation, growth of grains and neighbouring relationships is explored. (c) 2008 Acta Materialia Inc. Published by Elsevier Ltd. All rights reserved.

General information

State: Published
Pages: 491-494
Publication date: 2008
Main Research Area: Technical/natural sciences

Publication Information

Journal: Scripta Materialia
Volume: 59
Issue number: 5
ISSN (Print): 1359-6462
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.71 SJR 1.901 SNIP 1.696
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.3 SNIP 1.876 CiteScore 3.54
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.744 SNIP 2.124 CiteScore 3.55
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.347 SNIP 1.975 CiteScore 3.19
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.309 SNIP 2.022 CiteScore 3.01
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 2.333 SNIP 2.108 CiteScore 3.21
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.445 SNIP 2.125
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 2.574 SNIP 2.02
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.634 SNIP 2.128
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 2.229 SNIP 2.174
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.1 SNIP 1.915
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.831 SNIP 1.915
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.464 SNIP 1.731
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.499 SNIP 1.709
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.509 SNIP 1.345
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 1.301 SNIP 1.361
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.268 SNIP 1.123
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.53 SNIP 1.162

Original language: English
DOIs:
10.1016/j.scriptamat.2008.04.049
Direct observation of strain in bulk subgrains and dislocation walls by high angular resolution three-dimensional X-ray diffraction

The X-ray diffraction (XRD) method "high angular resolution 3DXRD" is briefly introduced, and results are presented for a single bulk grain in a polycrystalline copper sample deformed in tension. It is found that the three-dimensional reciprocal-space intensity distribution of a 400 reflection associated with the grain, shows a distinct structure consisting of sharp bright peaks superimposed on a cloud of enhanced intensity. The bright peaks (which arise from individual subgrains) are found to be subjected to backward strain (on average) while the fraction of the material giving rise to the cloud of enhanced intensity is subjected to forward strain. Based on the latter observation the, originally tentative, interpretation of the cloud as arising from dislocation walls is substantiated. (C) 2007 Elsevier B.V. All rights reserved.

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Jakobsen, B. (Intern), Lienert, U. (Ekstern), Almer, J. (Ekstern), Poulsen, H. F. (Intern), Pantleon, W. (Intern)
Pages: 641-643
Publication date: 2008
Conference: 14th International Conference on the Strength of Materials, Xi'an, China, 04/06/2006 - 04/06/2006
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Science & Engineering: A
Volume: 483-484
ISSN (Print): 0921-5093
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.39 SJR 1.666 SNIP 1.832
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.78 SNIP 1.849 CiteScore 3.01
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.285 SNIP 2.617 CiteScore 3.32
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.879 SNIP 2.231 CiteScore 2.86
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.737 SNIP 2.351 CiteScore 2.5
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.741 SNIP 2.406 CiteScore 2.59
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.702 SNIP 2.086
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.551 SNIP 1.74
Web of Science (2009): Indexed yes
In-Situ Observations of Subgrain Dynamics by High Energy X-Ray Diffraction

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Argonne National Laboratory
Pages: 57-57
Publication date: 2008

Host publication information
Title of host publication: Final Program
Publisher: TMS
Main Research Area: Technical/natural sciences
Conference: 137th TMS Annual Meeting and Exhibition, New Orleans, United States, 09/03/2008 - 09/03/2008
Source: orbit
Source-ID: 222915
Publication: Research - peer-review › Conference article – Annual report year: 2008

In situ study of the evolution of dislocation structures during strain path changes

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Argonne National Laboratory
Authors: Wejdemann, C. (Intern), Pantleon, W. (Intern), Lienert, U. (Ekstern), Poulsen, H. F. (Intern)
Pages: 5-5
Publication date: 2008

Host publication information
Title of host publication: Book of abstracts
Publisher: Organizing Committee
Main Research Area: Technical/natural sciences
Measuring the elastic strain of individual grains in polycrystalline materials

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Oddershede, J. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Sørensen, H. O. (Intern), Reimers, W. (Ekstern)
Publication date: 2008

Novel synchrotron based techniques for characterization of energy materials

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division, Metal Structures in Four Dimensions, Nano-Microstructures in Materials, European Synchrotron Radiation Facility
Authors: Poulsen, H. F. (Intern), Nielsen, S. F. (Intern), Olsen, U. L. (Intern), Schmidt, S. (Intern), Wright, J. (Ekstern)
Number of pages: 413
Pages: 101-122
Publication date: 2008

Reconstruction of Single-Grain Orientation Distribution Functions for Crystalline Materials

General information
State: Published
Organisations: Scientific Computing, Department of Informatics and Mathematical Modeling, Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Hansen, P. C. (Intern), Sørensen, H. O. (Intern), Sükösd, Z. (Intern), Poulsen, H. F. (Intern)
Publication date: 2008

Source: orbit
Source-ID: 228538
Publication: Research › Conference abstract in proceedings – Annual report year: 2008
Single Grain Characterization Techniques at the APS 1-ID Beamline

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Argonne National Laboratory, Carnegie Mellon University
Authors: Lienert, U. (Ekstern), Almer, J. (Ekstern), Jakobsen, B. (Intern), Pantleon, W. (Intern), Poulsen, H. F. (Intern), Hefferan, C. (Ekstern), Suter, R. (Ekstern)
Pages: 287-287
Publication date: 2008

Host publication information
Title of host publication: Final Program
Publisher: TMS
Main Research Area: Technical/natural sciences
Conference: 137th TMS Annual Meeting and Exhibition, New Orleans, United States, 09/03/2008 - 09/03/2008
Source: orbit
Source-ID: 228532
Publication: Research › Conference abstract in proceedings – Annual report year: 2008

Subgrains observed by high energy X-ray diffraction during in-situ loading

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division, Metal Structures in Four Dimensions, Argonne National Laboratory
Pages: 53-53
Publication date: 2008

Host publication information
Title of host publication: Book of abstracts
Publisher: Organizing Committee
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 228536
Publication: Research › Conference abstract in proceedings – Annual report year: 2008

Synchrotron radiation: A powerful tool for probing superconducting/metal composite wires and tapes

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division, Nano-Microstructures in Materials, Metal Structures in Four Dimensions, Deutsches Elektronen-Synchrotron
Authors: Grivel, J. (Intern), Abrahamsen, A. B. (Intern), Andersen, N. H. (Intern), Poulsen, H. F. (Intern), Homeyer, J. (Ekstern), Saksl, K. (Ekstern), Bednarcik, J. (Ekstern), v. Zimmermann, M. (Ekstern)
Number of pages: 47-63
Publication date: 2008

Host publication information
Place of publication: Roskilde
Three-dimensional materials science: An intersection of three-dimensional reconstructions and simulations

The recent development of experimental techniques that rapidly reconstruct the three-dimensional microstructures of solids has given rise to new possibilities for developing a deeper understanding of the evolution of microstructures and the effects of microstructures on materials properties. Combined with three-dimensional (3D) simulations and analyses that are capable of handling the complexity of these microstructures, 3D reconstruction, or tomography, has become a powerful tool that provides clear insights into materials processing and properties. This introductory article provides an overview of this emerging field of materials science, as well as brief descriptions of selected methods and their applicability.

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Thornton, K. (Ekstern), Poulsen, H. F. (Intern)
Pages: 587-595
Publication date: 2008
Main Research Area: Technical/natural sciences

Publication information
Journal: MRS BULLETIN
Volume: 33
Issue number: 6
ISSN (Print): 0883-7694
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 2.157 SNIP 1.669 CiteScore 3.2
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.697 SNIP 2.299 CiteScore 4.68
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.074 SNIP 1.911 CiteScore 3.61
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.036 SNIP 1.557 CiteScore 3
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.126 SNIP 1.923 CiteScore 3.04
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.095 SNIP 1.886 CiteScore 3.29
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.566 SNIP 2.147
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 2.021 SNIP 2.177
Three-dimensional materials science: An intersection of three-dimensional reconstructions and simulations

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Thornton, K. (Ekstern), Poulsen, H. F. (Intern)
Pages: 587-595
Publication date: 2008
Main Research Area: Technical/natural sciences

Publication information
Journal: MRS bulletin
Volume: 33
ISSN (Print): 0883-7694
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 2.157 SNIP 1.669 CiteScore 3.2
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.697 SNIP 2.299 CiteScore 4.68
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.074 SNIP 1.911 CiteScore 3.61
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.036 SNIP 1.557 CiteScore 3
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.126 SNIP 1.923 CiteScore 3.04
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.095 SNIP 1.886 CiteScore 3.29
Three-dimensional X-ray diffraction

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. F. (Intern)
Number of pages: 480
Pages: 249-277
Publication date: 2008

Host publication information
Title of host publication: Advanced Tomographic Methods in Materials Research and Engineering
Publisher: Oxford University Press
Editor: Banhart, J.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 234272
Publication: Research - peer-review › Book chapter – Annual report year: 2008

X-ray diffraction contrast tomography: a novel technique for three-dimensional grain mapping of polycrystals. 1. Direct beam case

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Ludwig, W. (Ekstern), Schmidt, S. (Intern), Lauridsen Mejdal, E. (Intern), Poulsen, H. F. (Intern)
Pages: 302-309
Publication date: 2008
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Applied Crystallography
3D characterisation of metal structures and their evolution

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Rise National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 2007
Event: Paper presented at IKM seminar, Dresden, Germany.
Main Research Area: Technical/natural sciences

3-dimensional characterization of polycrystalline bulk materials using high-energy synchrotron radiation

General information
State: Published
Organisations: Rise National Laboratory for Sustainable Energy
Pages: 2353-2358
Publication date: 2007
Main Research Area: Technical/natural sciences
4D analysis of metal structures

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 2007
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 216584
Publication: Research › Paper – Annual report year: 2007

A stochastic algorithm for reconstruction of grain maps of moderately deformed specimens based on X-ray diffraction

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Nano-Microstructures in Materials
Authors: Rodek, L. (Ekstern), Poulsen, H. F. (Intern), Knudsen, E. (Intern), Herman, G. (Ekstern)
Pages: 313-321
Publication date: 2007
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Applied Crystallography
Volume: 40
Issue number: 2
ISSN (Print): 0021-8898
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.51 SJR 1.242 SNIP 1.234
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.322 SNIP 2.588 CiteScore 3.97
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.585 SNIP 4.371 CiteScore 4.76
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.921 SNIP 6.392 CiteScore 6
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.572 SNIP 4.687 CiteScore 4.67
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.015 SNIP 5.863 CiteScore 5.32
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.6 SNIP 2.078
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 3.235 SNIP 2.117
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.126 SNIP 2.101
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.674 SNIP 3.489
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.112 SNIP 7.433
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.817 SNIP 2.339
Scopus rating (2004): SJR 1.618 SNIP 2.239
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.206 SNIP 1.618
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 2.31 SNIP 2.589
Scopus rating (2001): SJR 1.7 SNIP 2.059
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.009 SNIP 2.005
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.269 SNIP 1.49
Original language: English
DOIs:
Development of a high-efficiency high-resolution imaging detector for 30–80 keV X-rays

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Olsen, U. L. (Intern), Badel, X. (Ekstern), Linnros, J. (Ekstern), Michiel, M. D. (Ekstern), Martin, T. (Ekstern), Schmidt, S. (Intern), Poulsen, H. F. (Intern)
Pages: 52-55
Publication date: 2007
Conference: International workshop on radiation imaging detectors, Pisa (IT), 01/01/2006
Main Research Area: Technical/natural sciences

Publication information
Journal: Nuclear Instruments and Methods in Physics Research Section A
Volume: 576
ISSN (Print): 0168-9002
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.44 SJR 0.916 SNIP 1.352
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.915 SNIP 1.334 CiteScore 1.21
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.852 SNIP 1.303 CiteScore 1.24
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.944 SNIP 1.398 CiteScore 1.48
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.806 SNIP 1.071 CiteScore 1.19
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.918 SNIP 1.424 CiteScore 1.29
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.893 SNIP 1.113
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.75 SNIP 1.386
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.753 SNIP 1.073
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.716 SNIP 1.383
Diffraction with high energy X-rays: Synchrotron instrumentation and nano science

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 2007
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 216224
Publication: Research › peer-review › Conference article – Annual report year: 2007

Direct determination of elastic strains and dislocation densities in individual subgrains in deformation structures

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Jakobsen, B. (Intern), Poulsen, H. F. (Intern), Lienert, U. (Ekstern), Pantleon, W. (Intern)
Pages: 3421-3430
Publication date: 2007
Main Research Area: Technical/natural sciences

Publication information
Volume: 55
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.67 SJR 3.283 SNIP 2.674
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Discrete tomography for generating maps of polycrystals

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy, Nano-Microstructures in Materials
Ferrite formation during slow continuous cooling in steel

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division, Metal Structures in Four Dimensions
Authors: Offerman, S. (Ekstern), Strandlund, H. (Ekstern), Dijk, N. V. (Ekstern), Sietsma, J. (Ekstern), Lauridsen Mejdal, E. (Intern), Margulies, L. (Intern), Poulsen, H. F. (Intern), Ågren, J. (Ekstern), Zwaag, S. V. D. (Ekstern)
Pages: 357-362
Publication date: 2007
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Science Forum
Volume: 550
ISSN (Print): 0255-5476
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.28 SJR 0.186 SNIP 0.306
BFI (2015): BFI-level 1
Scopus rating (2015): SNIP 0.337 SJR 0.217 CiteScore 0.29
BFI (2014): BFI-level 1
Scopus rating (2014): SNIP 0.448 SJR 0.269 CiteScore 0.33
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SNIP 0.342 SJR 0.235 CiteScore 0.28
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SNIP 0.467 SJR 0.279 CiteScore 0.34
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SNIP 0.419 SJR 0.247 CiteScore 0.33
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SNIP 0.406 SJR 0.271
High-resolution three-dimensional mapping of individual grains in polycrystals by topotomography

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Ludwig, W. (Ekstern), Lauridsen Mejdal, E. (Intern), Schmidt, S. (Intern), Poulsen, H. F. (Intern), Baruchel, J. (Ekstern)
Pages: 905-911
Publication date: 2007
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Applied Crystallography
Volume: 40
ISSN (Print): 0021-8898
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.51 SJR 1.242 SNIP 1.234
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.322 SNIP 2.588 CiteScore 3.97
Web of Science (2015): Indexed yes
Intermittent subgrain dynamics during plastic deformation monitored by high-angular resolution 3DXRD

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Pantleon, W. (Intern), Jakobsen, B. (Ekstern), Lienert, U. (Ekstern), Poulsen, H. (Intern)
Publication date: 2007
Event: Paper presented at Conference on fluctuations and scaling in materials, Todi, Italy.
Main Research Area: Technical/natural sciences
Internal strains within individual grains of plastically deformed copper

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division, Metal Structures in Four Dimensions
Authors: Pantleon, W. (Intern), Jakobsen, B. (Intern), Lienert, U. (Ekstern), Prinz, M. (Ekstern), Poulsen, H. F. (Intern)
Pages: 43-43
Publication date: 2007

Investigation of the deformation structure in an aluminium magnesium alloy by high angular resolution three-dimensional X-ray diffraction

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Jakobsen, B. (Intern), Poulsen, H. F. (Intern), Lienert, U. (Ekstern), Huang, X. (Intern), Pantleon, W. (Intern)
Pages: 769-772
Publication date: 2007
Main Research Area: Technical/natural sciences

Publication information
Journal: Scripta Materialia
Volume: 56
ISSN (Print): 1359-6462
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.71 SJR 1.901 SNIP 1.696
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.3 SNIP 1.876 CiteScore 3.54
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.744 SNIP 2.124 CiteScore 3.55
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.347 SNIP 1.975 CiteScore 3.19
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.309 SNIP 2.022 CiteScore 3.01
Mapping polycrystals in 3D and studying their evolution

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 2007
Event: Paper presented at Møde i Videnskabernes Selskab, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 216608
Publication: Research - peer-review › Journal article – Annual report year: 2007

Plastic deformation monitored in-situ by high angular resolution 3DXRD: New insights and challenges

General information
State: Published

DOIs: 10.1016/j.scriptamat.2007.01.022
Source: orbit
Source-ID: 216608
Publication: Research › Paper – Annual report year: 2007
Properties and dynamics of bulk subgrains probed in-situ using a novel X-ray diffraction method

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Jakobsen, B. (Intern), Lienert, U. (Intern), Almer, J. (Ekstern), Pantleon, W. (Intern), Poulsen, H. F. (Intern)
Pages: 613-618
Publication date: 2007
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Science Forum
Volume: 550
ISSN (Print): 0255-5476
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.28 SJR 0.186 SNIP 0.306
BFI (2015): BFI-level 1
Scopus rating (2015): SNIP 0.337 SJR 0.217 CiteScore 0.29
BFI (2014): BFI-level 1
Scopus rating (2014): SNIP 0.448 SJR 0.269 CiteScore 0.33
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SNIP 0.342 SJR 0.235 CiteScore 0.28
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SNIP 0.467 SJR 0.279 CiteScore 0.34
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SNIP 0.419 SJR 0.247 CiteScore 0.33
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SNIP 0.406 SJR 0.271
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Revealing deformation microstructures

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Metal Structures in Four Dimensions, Materials Research Division
Authors: Wert, J. A. (Intern), Huang, X. (Intern), Winther, G. (Intern), Pantleon, W. (Intern), Poulsen, H. F. (Intern)
Pages: 24-32
Publication date: 2007
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Today
Volume: 10
ISSN (Print): 1369-7021
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 7.167 SNIP 5.305 CiteScore 11.2
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 6.61 SNIP 4.479 CiteScore 10.26
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 4.783 SNIP 3.386 CiteScore 7.4
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1

Scopus rating (2009): SNIP 0.389 SJR 0.343
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.297 SNIP 0.358
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.314 SNIP 0.5
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.37 SNIP 0.511
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.41 SNIP 0.56
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 0.449 SNIP 0.575
Web of Science (2004): Indexed yes
Scopus rating (2003): SNIP 0.548 SJR 0.457
Web of Science (2003): Indexed yes
Scopus rating (2002): SNIP 0.514 SJR 0.432
Web of Science (2002): Indexed yes
Scopus rating (2001): SNIP 0.524 SJR 0.403
Web of Science (2001): Indexed yes
Scopus rating (2000): SNIP 0.549 SJR 0.49
Web of Science (2000): Indexed yes
Scopus rating (1999): SNIP 0.526 SJR 0.548
Original language: English
DOIs:
10.4028/www.scientific.net/MSF.550.613
Source: orbit
Source-ID: 216625
Publication: Research - peer-review › Conference article – Annual report year: 2007
Strain in amorphous materials

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. F. (Intern)
Publication date: 2007
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 216008
Publication: Research › Paper – Annual report year: 2007

Visualizing the dynamics of dislocations structures

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division, Metal Structures in Four Dimensions
Authors: Jakobsen, B. (Intern), Wejdemann, C. (Ekstern), Panteleon, W. (Intern), Poulsen, H. (Intern), Lienert, U. (Intern), Bernier, J. (Ekstern), Almer, J. (Ekstern), Shastri, S. (Ekstern)
Publication date: 2007
Event: Abstract from Seminar at Argonne National Laboratory, Argonne, Chicago (USA)
A depth-resolved in-situ study of the reduction and oxidation of Ni-based anodes in solid oxide fuel cells

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Hagen, A. (Intern), Poulsen, H. (Intern), Klemensø, T. (Intern), Martins, R. (Ekstern), Honkimäki, V. (Ekstern), Buslaps, T. (Ekstern), Feidenshans'l, R. (Ekstern)
Pages: 361-366
Publication date: 2006
Main Research Area: Technical/natural sciences

Publication information
Journal: Fuel Cells
Volume: 6
ISSN (Print): 1615-6846
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.79 SJR 0.498 SNIP 0.62
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.699 SNIP 0.787 CiteScore 2.02
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.629 SNIP 0.816 CiteScore 2.05
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.841 SNIP 0.848 CiteScore 1.99
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.25 SNIP 1.008 CiteScore 2.76
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.656 SNIP 1.238 CiteScore 3.31
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.632 SNIP 1.243
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.368 SNIP 1.12
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.523 SNIP 1.226
Web of Science (2008): Indexed yes
A discrete tomography algorithm for improving the quality of three-dimensional X-ray diffraction grain maps

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Alpers, A. (Ekstern), Poulsen, H. (Intern), Knudsen, E. (Ekstern), Herman, G. (Ekstern)
Pages: 582-588
Publication date: 2006
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Applied Crystallography
Volume: 39
ISSN (Print): 0021-8898
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.51 SJR 1.242 SNIP 1.234
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.322 SNIP 2.588 CiteScore 3.97
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.585 SNIP 4.371 CiteScore 4.76
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.921 SNIP 6.392 CiteScore 6
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.572 SNIP 4.687 CiteScore 4.67
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.015 SNIP 5.863 CiteScore 5.32
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Asymmetric X-ray peak broadening by individual subgrains (talk)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Pantleon, W. (Intern), Jakobsen, B. (Intern), Lienert, U. (Ekstern), Poulsen, H. (Intern)
Number of pages: 204
Publication date: 2006

Host publication information
Title of host publication: Final program and abstracts
Place of publication: [s.l.]
Publisher: International Committee of International Conference on the Strength of Materials
Main Research Area: Technical/natural sciences
Conference: 14th International Conference on the Strength of Materials, Xi'an, China, 04/06/2006 - 04/06/2006
Source: orbit
Source-ID: 309398
Publication: Research › Conference abstract in proceedings – Annual report year: 2006

Formation and subdivision of deformation structures

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Jakobsen, B. (Intern), Poulsen, H. (Intern), Lienert, U. (Ekstern), Almer, J. (Ekstern), Shastri, S. (Ekstern), Sørensen, H. (Intern), Gundlach, C. (Intern), Pantleon, W. (Intern)
Publication date: 2006
Main Research Area: Technical/natural sciences
Formation and subdivision of deformation structures during plastic deformation

During plastic deformation of metals and alloys, dislocations arrange in ordered patterns. How and when these self-organization processes take place have remained elusive, because in situ observations have not been feasible. We present an x-ray diffraction method that provided data on the dynamics of individual, deeply embedded dislocation structures. During tensile deformation of pure copper, dislocation-free regions were identified. They showed an unexpected intermittent dynamics, for example, appearing and disappearing with proceeding deformation and even displaying transient splitting behavior. Insight into these processes is relevant for an understanding of the strength and work-hardening of deformed materials.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Pages: 889-892
Publication date: 2006
Main Research Area: Technical/natural sciences

Publication Information
Journal: Science
Volume: 312
Issue number: 5775
ISSN (Print): 0036-8075
Ratings:
BFI (2018): BFI-level 3
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 12.012 SNIP 8.269 CiteScore 12.68
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 12.305 SNIP 7.87 CiteScore 12.43
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 13.159 SNIP 8.124 CiteScore 12.39
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 14.049 SNIP 8.309 CiteScore 11.97
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 13.216 SNIP 7.791
Web of Science (2010): Indexed yes
Formation and subdivision of deformation structures (poster)

**General information**
- **State:** Published
- **Organisations:** Risø National Laboratory for Sustainable Energy
- **Authors:** Jakobsen, B. (Intern), Poulsen, H. (Intern), Lienert, U. (Ekstern), Pantleon, W. (Intern)
- **Number of pages:** 158
- **Publication date:** 2006

**Host publication information**
- **Title of host publication:** Book of abstracts
- **Place of publication:** Geneva
- **Publisher:** University of Geneva
- **Main Research Area:** Technical/natural sciences
- **Conference:** 10. European powder diffraction conference (EPDIC 10), Geneva (CH), 1-4 Sep, 01/01/2004
- **Source:** orbit
- **Source-ID:** 309468
- **Publication:** Research › Conference abstract in proceedings – Annual report year: 2006

Grain maps and grain dynamics - a reconstruction challenge (invited talk)

**General information**
- **State:** Published
- **Organisations:** Risø National Laboratory for Sustainable Energy
- **Authors:** Poulsen, H. (Intern)
- **Publication date:** 2006

**Event**
- **Abstract from IMA annual program year workshop:** New mathematics and algorithms for 3-D image analysis, Minneapolis (US), 9-12 Jan.
- **Main Research Area:** Technical/natural sciences
Grain nucleation and grain growth during phase transformations in steel

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Offerman, S. (Ekstern), Dijk, N. V. (Ekstern), Lauridsen, E. (Intern), Margulies, L. (Intern), Sietsma, J. (Ekstern), Poulsen, H. (Intern), Zwaag, S. V. D. (Ekstern)
Number of pages: 194
Publication date: 2006

**Host publication information**
Title of host publication: Book of abstracts
Place of publication: Denver, CO
Publisher: International Centre for Diffraction Data
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 309427
Publication: Research › Conference abstract in proceedings – Annual report year: 2006

In-situ observation of individual subgrains by 3DXRD during deformation and recovery

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Pages: 664-666
Publication date: 2006

**Host publication information**
Title of host publication: Anisotropy, texture, dislocations and multiscale modeling in finite plasticity and viscoplasticity, and metal forming. Proceedings
Place of publication: Fulton, MD
Publisher: NEAT Press
Editors: Khan, A., Kazmi, R., Baig, M., Farrokh, B., Pandey, A.
ISBN (Print): 0-9659463-6-3
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 309399
Publication: Research › Article in proceedings – Annual report year: 2006

Mapping grains and their dynamics in three dimensions

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Nano-Microstructures in Materials, Materials Research Division, Metal Structures in Four Dimensions
Authors: Sørensen, H. (Intern), Jakobsen, B. (Intern), Bergbäck Knudsen, E. (Intern), Lauridsen, E. (Intern), Fæster Nielsen, S. (Intern), Poulsen, H. (Intern), Schmidt, S. (Intern), Winther, G. (Intern), Margulies, L. (Intern)
Pages: 232-237
Publication date: 2006
Conference: E-MRS 2005 Symposium O on Synchrotron Radiation and Materials Science, Strasbourg, France, 31/05/2005 - 31/05/2005
Main Research Area: Technical/natural sciences
Non-destructive characterization of recrystallization kinetics using three-dimensional X-ray diffraction microscopy

Three-dimensional X-ray diffraction (3DXRD) is used to characterize the nucleation and early growth of individual bulk nuclei in situ during recrystallization of 92% cold-rolled copper. It is found that some cube nuclei, but not all, have a significantly faster initial growth than the average growth kinetics. These results are discussed and compared to previous 3DXRD results for recrystallization of aluminum alloys, and implications of the results on modeling of recrystallization are considered. Finally, a new 3DXRD technique suitable for non-destructive 3D characterization is outlined and its potential for recrystallization studies is discussed. (c) 2006 Acta Materialia Inc. Published by Elsevier Ltd. All rights reserved.
Optimized algebraic reconstruction technique for generation of grain maps based on three-dimensional x-ray diffraction (3DXRD)

General information
State: Published
Organisations: Nano-Microstructures in Materials, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Fu, X. (Ekstern), Bergbäck Knudsen, E. (Intern), Poulsen, H. (Intern), Herman, G. (Ekstern), Carvalho, B. (Ekstern), Liao, H. (Ekstern)
Pages: 116501 (9 pages)
Publication date: 2006
Main Research Area: Technical/natural sciences

Publication information
Volume: 45
Original language: English
DOI: 10.1117/1.2390680
Source: orbit
Source-ID: 309749
Publication: Research - peer-review › Journal article – Annual report year: 2006

Peak profile analysis of individual grains within bulk metals under tensile deformation (invited keynote)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Almer, J. (Ekstern), Jakobsen, B. (Intern), Pantleon, W. (Intern), Poulsen, H. (Intern)
Phase transformations in steel studied by 3DXRD microscopy

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Offerman, S. (Ekstern), Dijk, N. V. (Ekstern), Sietsma, J. (Ekstern), Lauridsen, E. (Intern), Margulies, L. (Intern), Grigull, S. (Ekstern), Poulsen, H. (Intern), Zwaag, S. V. D. (Ekstern)
Pages: 194-200
Publication date: 2006
Conference: E-MRS 2005 Symposium O on Synchrotron Radiation and Materials Science, Strassbourg, France, 31/05/2005 - 31/05/2005
Main Research Area: Technical/natural sciences

Publication information
Journal: Nuclear Instruments & Methods in Physics Research. Section B: Beam Interactions with Materials and Atoms
Volume: 246
ISSN (Print): 0168-583X
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.22 SJR 0.691 SNIP 0.906
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.74 SNIP 1.065 CiteScore 1.32
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.616 SNIP 0.905 CiteScore 1.14
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.681 SNIP 1.205 CiteScore 1.47
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.663 SNIP 0.989 CiteScore 1.18
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.685 SNIP 1.071 CiteScore 1.24
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.846 SNIP 0.971
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.672 SNIP 0.925
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.646 SNIP 0.851
Web of Science (2008): Indexed yes
Properties and dynamics of bulk subgrains probed in-situ using a novel X-ray diffraction method (talk)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Jakobsen, B. (Intern), Lienert, U. (Ekstern), Almer, J. (Ekstern), Pantleon, W. (Intern), Poulsen, H. (Intern)
Number of pages: 11
Publication date: 2006

Host publication information
Title of host publication: Book of abstracts
Place of publication: Manchester
Publisher: University of Manchester
Main Research Area: Technical/natural sciences
Conference: Symposium on fundamentals of deformation and annealing, Manchester (GB), 5-7 Sep, 01/01/2006
Source: orbit
Source-ID: 309470
Publication: Research › Conference abstract in proceedings – Annual report year: 2006

Ultra-high angular resolution 3DXRD for observing bulk subgrains and their dynamics (talk)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Jakobsen, B. (Intern), Lienert, U. (Ekstern), Almer, J. (Ekstern), Pantleon, W. (Intern), Poulsen, H. (Intern)
Number of pages: 156
Publication date: 2006

Host publication information
Title of host publication: Final program and abstracts
Place of publication: [s.l.]
Publisher: International Committee of International Conference on the Strength of Materials
Main Research Area: Technical/natural sciences
Conference: 14th International Conference on the Strength of Materials, Xi'an, China, 04/06/2006 - 04/06/2006
Links:
Source: orbit
Visiting the dynamics of grains and dislocations structures (invited)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Number of pages: 191
Publication date: 2006

Host publication information
Title of host publication: Book of abstracts
Place of publication: Denver, CO
Publisher: International Centre for Diffraction Data
Main Research Area: Technical/natural sciences
Source: orbit

X-ray microscopy in four dimensions

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Metal Structures in Four Dimensions, Materials Research Division
Authors: Juul Jensen, D. (Intern), Lauridsen, E. (Intern), Margulies, L. (Intern), Poulsen, H. (Intern), Schmidt, S. (Intern), Sørensen, H. (Intern), Vaughan, G. (Ekstern)
Pages: 18-25
Publication date: 2006
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Today
Volume: 9
ISSN (Print): 1369-7021
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 7.167 SNIP 5.305 CiteScore 11.2
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 6.61 SNIP 4.479 CiteScore 10.26
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 4.783 SNIP 3.386 CiteScore 7.4
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 4.376 SNIP 3.261 CiteScore 6.81
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.595 SNIP 2.172 CiteScore 3.7
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Discrete tomographic reconstruction of 2D polycrystal orientation maps from X-ray diffraction projections using Gibbs priors

The determination of crystalline structures is a demanding and fundamental task of crystallography. This paper offers a new approach for rendering a 2D grain map of a polycrystal based on an orientation map reconstructed from X-ray diffraction patterns. The orientation map is produced by a Bayesian discrete tomographic algorithm, applying image-modelling Gibbs priors and a homogeneity condition. The optimization of the objective function is accomplished via the Gibbs Sampler in conjunction with simulated annealing. In order to express the structure of the orientation map, the similarity of orientations is defined by means of quaternions.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Rodek, L. (Ekstern), Knudsen, E. (Ekstern), Poulsen, H. (Intern), Herman, G. (Ekstern)
Pages: 439-453
Publication date: 1 Jul 2005
Conference: Workshop on Discrete Tomography and its Applications, New York, United States, 13/06/2005 - 13/06/2005
Main Research Area: Technical/natural sciences

Publication information
Journal: Electronic Notes in Discrete Mathematics
Volume: 20
ISSN (Print): 1571-0653
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.32 SJR 0.269 SNIP 0.377
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.305 SNIP 0.397 CiteScore 0.35
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.211 SNIP 0.257 CiteScore 0.26
3DXRD microscopy for the study of solid-state phase transformation kinetics

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Offerman, S. (Ekstern), Dijk, N. V. (Ekstern), Sietsma, J. (Ekstern), Lauridsen, E. (Intern), Margulies, L. (Intern), Grigull, S. (Ekstern), Poulsen, H. (Intern), Zwaag, S. V. D. (Ekstern)
Pages: 107-110
Publication date: 2005
Main Research Area: Technical/natural sciences

Publication information
Journal: Nuclear Instruments & Methods in Physics Research. Section B: Beam Interactions with Materials and Atoms
Volume: 238
ISSN (Print): 0168-583X
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.22 SJR 0.691 SNIP 0.906
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.74 SNIP 1.065 CiteScore 1.32
Algorithms and instrumentation for generating 3D grain maps in polycrystals by 3DXRD

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Knudsen, E. (Ekstern), Poulsen, H. (Intern), Schmidt, S. (Intern), Sørensen, H. (Intern), Lauridsen, E. (Intern), Markussen, T. (Ekstern), Fu, X. (Ekstern)
Publication date: 2005
Characterisation of orientation distributions of individual grains within deformed metals

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Lienert, U. (Ekstern), Pantleon, W. (Intern)
Pages: 1397-1400
Publication date: 2005
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Science and Technology
Volume: 21
ISSN (Print): 0267-0836
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.43 SJR 0.814 SNIP 0.812
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.632 SNIP 0.764 CiteScore 1.1
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.788 SNIP 1.005 CiteScore 1.1
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.636 SNIP 0.868 CiteScore 0.92
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.683 SNIP 0.979 CiteScore 0.86
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.674 SNIP 1.059 CiteScore 0.94
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.638 SNIP 0.779
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.876 SNIP 1.08
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.785 SNIP 1.035
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.749 SNIP 1.195
Discrete tomographic reconstruction of 2D polycrystal orientation maps from X-ray diffraction projections using Gibbs priors

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Rodek, L. (Ekstern), Knudsen, E. (Ekstern), Poulsen, H. (Intern), Herman, G. (Ekstern)
Publication date: 2005
Event: Abstract from Workshop on Discrete Tomography and its Applications, New York, United States.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 308628
Publication: Research › Conference abstract for conference – Annual report year: 2005

Image analysis for X-ray studies of the dynamics of individual embedded subgrains during recovery

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Pages: 1476-1479
Publication date: 2005
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Science and Technology
Volume: 21
ISSN (Print): 0267-0836
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.43 SJR 0.814 SNIP 0.812
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.632 SNIP 0.764 CiteScore 1.1
Web of Science (2015): Indexed yes
Mapping grains and their dynamics in 3 dimensions

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Publication date: 2005
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 308345
Measuring strains in grains, sub-grains, glasses and polymers (invited talk)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Publication date: 2005
Event: Abstract from MECA-SENS 3, Session 7: Small length scale and biological applications, Santa Fe, NM (US), 17-19 Oct., .
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 308642
Publication: Research › Conference abstract for conference – Annual report year: 2005

Multiscale study of internal stress and texture in ferroelectrics

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Ustundag, E. (Ekstern), Rogan, R. (Ekstern), Daymond, M. (Ekstern), Tamura, N. (Ekstern), Margulies, L. (Intern), Poulsen, H. (Intern)
Pages: 28-28
Publication date: 2005
Main Research Area: Technical/natural sciences
Nucleation of recrystallization observed in situ in the bulk of a deformed metal

Nucleation of recrystallization is studied in situ in the bulk by three-dimensional X-ray diffraction. Copper samples cold rolled 20% are investigated. The crystallographic orientations near triple junction lines are characterized before, during and after annealing. Three nuclei are identified and it is shown that two nuclei are twin related to their parent grain and one nucleus has an orientation, which is neither present in the deformed parent grains nor first order twin related to any of them. Data on the nucleation kinetics is also presented. (c) 2005 Acta Materialia Inc. Published by Elsevier Ltd. All rights reserved.
Resolving ambiguities in reconstructed grain maps using discrete tomography
Resolving ambiguities in reconstructed grain maps using discrete tomography

The so-called 3DXRD microscope, implemented at the European Synchrotron Radiation Facility in Grenoble, France, utilizes the principle of X-ray diffraction for mapping the crystalline grains within hard materials such as metals or ceramics. Present algorithms, using continuous models, roughly reconstruct the image from diffraction data, but they are often unable to assign unambiguous values to all pixels. We present an approach that resolves these ambiguous pixels by using a Monte Carlo technique that exploits the discrete nature of the problem and utilizes proven methods of discrete tomography. Based on simulations we show that most ambiguities can be successfully resolved.
Scopus rating (2005): SJR 0.182 SNIP 0.35
Scopus rating (2004): SJR 0.132 SNIP 0.108
Scopus rating (2003): SJR 0.128 SNIP 0.052
Scopus rating (2002): SJR 0.111 SNIP 0.031
Scopus rating (2001): SJR 0.104 SNIP 0.002
Scopus rating (2000): SJR 0.106 SNIP 0.147
Original language: English
Discrete tomography, Polycrystals, Crystallography, Gibbs distribution, X-ray diffraction, Image restoration
DOI:
10.1016/j.endm.2005.05.076
Source: orbit
Source-ID: 310154
Publication: Research - peer-review › Conference article – Annual report year: 2005

Total crystallography: 3DXRD for molecular compounds

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Sørensen, H. (Intern), Schmidt, S. (Intern), Vaughan, G. (Ekstern), Poulsen, H. (Intern)
Publication date: 2005
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 308344
Publication: Research › Conference abstract for conference – Annual report year: 2005

Ultra-high angular resolution 3DXRD for observing bulk subgrains (poster)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Jakobsen, B. (Intern), Lienert, U. (Ekstern), Almer, J. (Ekstern), Poulsen, H. (Intern), Pantleon, W. (Intern)
Publication date: 2005
Event: Poster session presented at 35. Danske krystallografmøde; DANSYNC's 7. Årsmøde, Sandbjerg, Denmark.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 308518
Publication: Research › Poster – Annual report year: 2005

3DXRD - Mapping grains and their dynamics in 3 dimensions

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Fu, X. (Ekstern), Knudsen, E. (Ekstern), Lauridsen, E. (Intern), Margulies, L. (Intern), Schmidt, S. (Intern)
Pages: 1363-1372
Publication date: Oct 2004
Conference: 2nd Joint International Conference on Recrystallization and Grain Growth, ReX and GG2, Annecy, France, 30/08/2004 - 30/08/2004
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Science Forum
Volume: 467-470
ISSN (Print): 0255-5476
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
3DXRD – a new probe for materials science

General information
State: Published
Organisations: Metal Structures in Four Dimensions, Materials Research Division, Risø National Laboratory for Sustainable Energy
3DXRD: Grain maps, grain dynamics and grain refinements

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Pages: 29-43
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Journal: Crystallography Reviews
Volume: 10
ISSN (Print): 0889-311X
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.594 SNIP 0.525 CiteScore 0.7
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.456 SNIP 0.397 CiteScore 0.71
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.732 SNIP 1.081 CiteScore 1.59
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.098 SNIP 0.963 CiteScore 1.71
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.404 SNIP 1.141 CiteScore 1.7
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.743 SNIP 0.707 CiteScore 0.97
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.565 SNIP 1.838
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.529 SNIP 0.939
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.766 SNIP 0.641
Scopus rating (2007): SJR 0.35 SNIP 0.863
Scopus rating (2006): SJR 0.538 SNIP 1.291
Scopus rating (2005): SJR 0.76 SNIP 0.556
Scopus rating (2004): SJR 0.326 SNIP 0.335
3DXRD - Mapping polycrystals and their dynamics in 3D

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 2004
Event: Abstract from Temamøde i Dansk Keramisk Selskab om nanomaterialer og -strukturer, Århus (DK), 19 Nov, .
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 307344
Publication: Research › Conference abstract for conference – Annual report year: 2004

An algebraic algorithm for generation of three-dimensional grain maps based on diffraction with a wide beam of hard X-rays

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Markussen, T. (Ekstern), Fu, X. (Ekstern), Margulies, L. (Intern), Lauridsen, E. (Intern), Fæster Nielsen, S. (Intern), Schmidt, S. (Intern), Poulsen, H. (Intern)
Pages: 96-102
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Applied Crystallography
Volume: 37
ISSN (Print): 0021-8898
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.51 SJR 1.242 SNIP 1.234
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.322 SNIP 2.588 CiteScore 3.97
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.585 SNIP 4.371 CiteScore 4.76
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.921 SNIP 6.392 CiteScore 6
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Characterising the dynamics of individual embedded dislocation structures

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Fuel Cells and Solid State Chemistry Division, Microstructures and Interfaces
Authors: Poulsen, H. (Intern), Bowen, J. R. (Intern), Gundlach, C. (Intern)
Pages: 783-788
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Journal: Scripta Materialia
Volume: 51
ISSN (Print): 1359-6462
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
Direct observation of subgrain evolution during recovery of cold-rolled aluminium

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Pages: 477-481
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Journal: Scripta Materialia
Volume: 50
ISSN (Print): 1359-6462
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.71 SJR 1.901 SNIP 1.696
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.3 SNIP 1.876 CiteScore 3.54
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.744 SNIP 2.124 CiteScore 3.55
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.347 SNIP 1.975 CiteScore 3.19
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.309 SNIP 2.022 CiteScore 3.01
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 2.333 SNIP 2.108 CiteScore 3.21
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.445 SNIP 2.125
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 2.574 SNIP 2.02
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.634 SNIP 2.128
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 2.229 SNIP 2.174
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.1 SNIP 1.915
Web of Science (2006): Indexed yes
Emerging order in dislocation structures during metal loading (invited talk)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Pantleon, W. (Intern), Jakobsen, B. (Intern), Poulsen, H. (Intern), Almer, J. (Ekstern), Lienert, U. (Ekstern)
Publication date: 2004
Event: Abstract from Workshop on science with high energy X-rays, Argonne, IL (US), 9-10 Aug, .
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 307067
Publication: Research › Conference abstract for conference – Annual report year: 2004

Evolving microstructures in carbon steel studied by 3DXRD microscopy

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Offerman, S. (Ekstern), Zijden, A. V. D. (Ekstern), Dijk, H. V. (Ekstern), Sietsma, J. (Ekstern), Lauridsen, E. (Intern), Margulies, L. (Intern), Grigull, S. (Ekstern), Poulsen, H. (Intern), Zwaag, S. V. D. (Ekstern)
Pages: 471-480
Publication date: 2004
Host publication information
Title of host publication: Evolution of deformation microstructures in 3D. Proceedings
Place of publication: Roskilde
Publisher: Risø National Laboratory
ISBN (Print): 87-550-3362-8
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 307218
Publication: Research › Article in proceedings – Annual report year: 2004

Ferrite nucleation and growth in medium-carbon steel studied by 3DXRD microscopy

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
In-situ investigation of bulk nucleation by X-ray diffraction

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Larsen, A. (Intern), Gundlach, C. (Intern), Poulsen, H. (Intern), Margulies, L. (Intern), Xing, Q. (Intern), Juul Jensen, D. (Intern)
Pages: 81-86
Publication date: 2004
Conference: 2nd Joint International Conference on Recrystallization and Grain Growth, ReX and GG2, Annecy, France, 30/08/2004 - 30/08/2004
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Science Forum
Volume: 467-470
ISSN (Print): 0255-5476
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.28 SJR 0.186 SNIP 0.306
BFI (2015): BFI-level 1
Scopus rating (2015): SNIP 0.337 SJR 0.217 CiteScore 0.29
BFI (2014): BFI-level 1
Scopus rating (2014): SNIP 0.448 SJR 0.269 CiteScore 0.33
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SNIP 0.342 SJR 0.235 CiteScore 0.28
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SNIP 0.467 SJR 0.279 CiteScore 0.34
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SNIP 0.419 SJR 0.247 CiteScore 0.33
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SNIP 0.406 SJR 0.271
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
In-situ observation of subgrain evolution during static recovery of cold-rolled aluminium

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Pages: 1389-1394
Publication date: 2004
Conference: 2nd Joint International Conference on Recrystallization and Grain Growth, ReX and GG2, Annecy, France, 30/08/2004 - 30/08/2004
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Science Forum
Volume: 467-470
ISSN (Print): 0255-5476
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.28 SJR 0.186 SNIP 0.306
BFI (2015): BFI-level 1
Scopus rating (2015): SNIP 0.337 SJR 0.217 CiteScore 0.29
BFI (2014): BFI-level 1
Scopus rating (2014): SNIP 0.448 SJR 0.269 CiteScore 0.33
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
In situ X-ray peak shape analysis of embedded individual grains during plastic deformation of metals

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Pantleon, W. (Intern), Poulsen, H. (Intern), Almer, J. (Ekstern), Lienert, U. (Ekstern)
Pages: 339-342
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Volume: 387-389
ISSN (Print): 0921-5093
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.39 SJR 1.666 SNIP 1.832
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.78 SNIP 1.849 CiteScore 3.01
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.285 SNIP 2.617 CiteScore 3.32
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.879 SNIP 2.231 CiteScore 2.86
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.737 SNIP 2.351 CiteScore 2.5
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.741 SNIP 2.406 CiteScore 2.59
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.702 SNIP 2.086
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.551 SNIP 1.74
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.678 SNIP 1.847
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.32 SNIP 1.68
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.337 SNIP 1.748
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.163 SNIP 1.448
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.167 SNIP 1.64
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.295 SNIP 1.606
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.248 SNIP 1.348
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 1.147 SNIP 1.347
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.086 SNIP 1.074
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.181 SNIP 1.049
Original language: English
DOIs:
10.1016/j.msea.2004.02.080
Investigating the effect of grain interaction during plastic deformation of copper

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Han, T. (Ekstern), Almer, J. (Ekstern), Dawson, P. (Ekstern), Leffers, T. (Intern), Margulies, L. (Intern), Fæster Nielsen, S. (Intern), Poulsen, H. (Intern), Schmidt, S. (Intern)
Pages: 4461-4467
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Volume: 52
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.67 SJR 3.283 SNIP 2.674
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 3.542 SNIP 2.927 CiteScore 5.22
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 4.045 SNIP 3.348 CiteScore 5.16
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 3.29 SNIP 2.709 CiteScore 4.37
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 3.409 SNIP 2.917 CiteScore 4.28
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.247 SNIP 2.81 CiteScore 4.27
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 3.745 SNIP 2.724
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 3.677 SNIP 2.648
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 3.863 SNIP 2.787
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 3.298 SNIP 3.068
Web of Science (2007): Indexed yes
Lattice rotations of individual bulk grains. Part 2: Correlation with initial orientation and model comparison

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Winther, G. (Intern), Margulies, L. (Intern), Schmidt, S. (Intern), Poulsen, H. (Intern)
Pages: 2863-2872
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Volume: 52
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.67 SJR 3.283 SNIP 2.674
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 3.542 SNIP 2.927 CiteScore 5.22
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 4.045 SNIP 3.348 CiteScore 5.16
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 3.29 SNIP 2.709 CiteScore 4.37
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 3.409 SNIP 2.917 CiteScore 4.28
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Measurement of the components of plastic displacement gradients in three dimensions

A method for non-destructive characterization of plastic deformation in bulk materials is presented. The method is based on X-ray absorption contrast micro-tomography using X-rays from a synchrotron radiation source. The method can be applied to materials that contain marker particles, which have an atomic number significantly different from that of the matrix material. The size of the marker particles can be 1-2 μm and their positions (x, y, z) are determined as a function of strain. The use of the method is demonstrated by a compression study of an aluminium specimen containing tungsten marker particles. (C) 2004 Elsevier B.V. All rights reserved.
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.39 SJR 1.666 SNIP 1.832
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.78 SNIP 1.849 CiteScore 3.01
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.285 SNIP 2.617 CiteScore 3.32
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.879 SNIP 2.231 CiteScore 2.86
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.737 SNIP 2.351 CiteScore 2.5
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.741 SNIP 2.406 CiteScore 2.59
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.702 SNIP 2.086
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.551 SNIP 1.74
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.678 SNIP 1.847
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.32 SNIP 1.68
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.337 SNIP 1.748
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.163 SNIP 1.448
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.167 SNIP 1.64
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.295 SNIP 1.606
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.248 SNIP 1.348
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 1.147 SNIP 1.347
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.086 SNIP 1.074
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.181 SNIP 1.049
Original language: English
synchrotron radiation, plastic deformation, X-ray tomography, image analysis
DOIs:
10.1016/j.msea.2004.01.090
Source: orbit
Source-ID: 307323
Measurement of the components of plastic displacement gradients in three dimensions

A method for non-destructive characterization of plastic deformation in bulk materials is presented. The method is based on X-ray absorption microtomography investigations using X-rays from a synchrotron source. The method can be applied to materials that contain marker particles, which have an atomic number significantly different from that of the matrix material. Data were acquired at the dedicated microtomography instrument at beamline BW2 at HASYLAB / DESY, for a cylindrical aluminium sample containing W particles with an average particle diameter of 7 mum. The minimum detectable size of the marker particles is 1-2 mum with the present spatial resolution at HASYLAB. The position (x,y,z) of all the detected marker particles within 1 mm(3) was determined as function of strain. The sample was deformed in stepwise compression along the axis of the cylinder. A tomographic scan was performed after each deformation step. After a series of image analysis steps to identify the centre of mass of individual particles and alignment of the successive tomographic reconstructions, the displacements of individual particles could be tracked as a function of external strain. The particle displacements are then used to identify local displacement gradient components, from which the local 3D plastic strain tensor can be determined. This allows us to map the strain components as a function of location inside a deforming metallic solid.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Fæster Nielsen, S. (Intern), Beckmann, F. (Ekstern), Godiksen, R. (Intern), Haldrup, K. (Ekstern), Poulsen, H. (Intern), Wert, J. (Ekstern)
Pages: 485-492
Publication date: 2004

Host publication information
Title of host publication: Developments in X-ray tomography 4
Place of publication: Bellingham, WA
Publisher: The International Society for Optical Engineering
Editor: Bonse, U.
ISBN (Print): 0-8194-5473-7

Series: Proceedings of SPIE - International Society for Optical Engineering
Volume: 5535
ISSN: 0277-786X
Main Research Area: Technical/natural sciences
synchrotron radiation, plastic deformation, X-ray tomography, discrete tomography, image analysis
DOIs:
10.1117/12.559641
Source: orbit
Source-ID: 307541
Publication: Research - peer-review › Article in proceedings – Annual report year: 2004

Multicrystal approach to crystal structure solution and refinement

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Vaughan, G. (Ekstern), Schmidt, S. (Intern), Poulsen, H. (Intern)
Pages: 813-825
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Journal: Zeitschrift für Kristallographie - Crystalline Materials
Volume: 219
Issue number: 12
ISSN (Print): 2194-4946
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Observation of dislocation structure evolution by analysis of X-ray peak profiles from individual bulk grains

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Almer, J. (Ekstern), Jakobsen, B. (Intern), Poulsen, H. (Intern), Pantleon, W. (Intern)
Pages: 417-422
Publication date: 2004

Host publication information
Title of host publication: Evolution of deformation microstructures in 3D. Proceedings
Observation of X-ray peak profiles from individual bulk grains

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Almer, J. (Ekstern), Jakobsen, B. (Intern), Poulsen, H. (Intern), Pantleon, W. (Intern)
Publication date: 2004
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 307198
Publication: Research › Conference abstract for conference – Annual report year: 2004

Optimization of an algebraic reconstruction technique for generation of grain maps based on diffraction data

General information
State: Published
Organisations: Nano-Microstructures in Materials, Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Fu, X. (Ekstern), Bergbäck Knudsen, E. (Intern), Poulsen, H. (Intern), Herman, G. (Ekstern), Carvalho, B. (Ekstern), Liao, H. (Ekstern)
Pages: 261-273
Publication date: 2004

Host publication information
Title of host publication: Developments in X-ray tomography 4
Place of publication: Bellingham, WA
Publisher: The International Society for Optical Engineering
Editor: Bonse, U.
ISBN (Print): 0-8194-5473-7
Series: SPIE Proceedings Series, 5535
Main Research Area: Technical/natural sciences
Conference: SPIE Annual Meeting 2004: Radiation Technologies, Denver, CO (US), 4-6 Ang, 01/01/2004
Source: orbit
Source-ID: 307540
Publication: Research - peer-review › Article in proceedings – Annual report year: 2004

Orientation changes of individual bulk grains during deformation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Winther, G. (Intern), Margulies, L. (Intern), Poulsen, H. (Intern)
Pages: 75-76
Publication date: 2004
Conference: Symposium on microstructural stability in honor of professor Roger D. Doherty, Charlotte, NC (US), 14-18 Mar, 01/01/2004
Main Research Area: Technical/natural sciences

Publication information
Journal: TMS Letters
Volume: 1
Reply to the discussion by Aaronson et al. to "Grain nucleation and growth during phase transformations" by S.E. Offerman et al., Science, 298, 1003 (November 1, 2002)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Offerman, S. (Ekstern), Dijk, N. V. (Ekstern), Sietsma, J. (Ekstern), Zwaag, S. V. D. (Ekstern), Lauridsen, E. (Intern), Margulies, L. (Intern), Grigull, S. (Ekstern), Poulsen, H. (Intern)
Pages: 937-941
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Journal: Scripta Materialia
Volume: 51
ISSN (Print): 1359-6462
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.71 SJR 1.901 SNIP 1.696
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.3 SNIP 1.876 CiteScore 3.54
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.744 SNIP 2.124 CiteScore 3.55
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.347 SNIP 1.975 CiteScore 3.19
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.309 SNIP 2.022 CiteScore 3.01
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 2.333 SNIP 2.108 CiteScore 3.21
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.445 SNIP 2.125
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 2.574 SNIP 2.02
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.634 SNIP 2.128
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 2.229 SNIP 2.174
Simultaneous measurement of the strain tensor of 10 individual grains embedded in an Al tensile sample

First results are presented on the simultaneous observation of the elastic strain tensor as a function of load of 10 individual grains, deeply embedded in the bulk of a polycrystalline Al tensile sample. The experimental technique is based on the use of focused high energy synchrotron radiation in transmission geometry. After each load step diffraction patterns are collected with a large-area X-ray detector system for a series of different angular and lateral sample positions. An automated indexing routine was used to assign sets of diffraction spots to individual grains. The strain tensor components as well as the individual grain position within the sample were then fitted from the diffraction spot positions. A maximum tensile load of 48 MPa was applied. Deviations in strain of up to $600 \times 10^{-6}$ are observed between respective strain components of individual grains.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Martins, R. (Ekstern), Margulies, L. (Intern), Schmidt, S. (Intern), Poulsen, H. (Intern), Leffers, T. (Intern)
Pages: 84-88
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Volume: 387-389
ISSN (Print): 0921-5093
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.39 SJR 1.666 SNIP 1.832
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.78 SNIP 1.849 CiteScore 3.01
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.285 SNIP 2.617 CiteScore 3.32
Solid-state transformations involving solute partitioning: Modeling and measuring on the level of individual grains

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Offerman, S. (Ekstern), Dijk, N. V. (Ekstern), Sietsma, J. (Ekstern), Lauridsen, E. (Intern), Margulies, L. (Intern), Grigull, S. (Ekstern), Poulsen, H. (Intern), Zwaag, S. V. D. (Ekstern)
Pages: 4757-4766
Publication date: 2004
Main Research Area: Technical/natural sciences
Three-dimensional imaging and analysis of internal dynamics in solid bodies using X-ray micro-tomography (poster)

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Haldrup, K. (Ekstern), Fæster Nielsen, S. (Intern), Poulsen, H. (Intern), Beckmann, F. (Ekstern), Wert, J. (Ekstern)
Publication date: 2004
Event: Poster session presented at Danish Physical Society Annual Meeting 2004, Nyborg, Denmark.
Main Research Area: Technical/natural sciences

Three-dimensional X-ray diffraction (3DXRD) analysis

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Margulies, L. (Intern), Poulsen, H. (Intern)
Publication date: 2004

Host publication information
Title of host publication: Evolution of deformation microstructures in 3D. Proceedings
Place of publication: Roskilde
Publisher: Risø National Laboratory
ISBN (Print): 87-550-3362-8
Main Research Area: Technical/natural sciences

Three-dimensional X-ray diffraction microscopy. Mapping polycrystals and their dynamics

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Number of pages: 154
Publication date: 2004

Publication information
Place of publication: Berlin
Publisher: Springer
ISBN (Print): 3-540-22330-4
Original language: English
Series: Springer Tracts in Modern Physics, v. 205
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 307186
Publication: Research - peer-review › Book – Annual report year: 2004
Three-dimensional X-ray diffraction microscopy using high-energy X-rays

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Juul Jensen, D. (Intern), Vaughan, G. (Ekstern)
Pages: 166-169
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Journal: M R S Bulletin
Volume: 29
ISSN (Print): 0883-7694
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 2.157 SNIP 1.669 CiteScore 3.2
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.697 SNIP 2.299 CiteScore 4.68
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.074 SNIP 1.911 CiteScore 3.61
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.036 SNIP 1.557 CiteScore 3
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.126 SNIP 1.923 CiteScore 3.04
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.095 SNIP 1.886 CiteScore 3.29
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.566 SNIP 2.147
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 2.021 SNIP 2.177
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 2.201 SNIP 2.076
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.672 SNIP 1.816
Scopus rating (2006): SJR 1.515 SNIP 1.945
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.364 SNIP 2.234
Scopus rating (2004): SJR 1.156 SNIP 1.947
Web of Science (2004): Indexed yes
Scopus rating (2002): SJR 1.447 SNIP 2.294
Scopus rating (2001): SJR 1.577 SNIP 2.32
Scopus rating (2000): SJR 2.196 SNIP 2.249
3D-characterisation of microstructure evolution during annealing of a deformed aluminum single crystal

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Lauridsen, E. (Intern), Schmidt, S. (Ekstern), Margulies, L. (Intern), Driver, J. (Ekstern)
Pages: 2517-2529
Publication date: 2003
Main Research Area: Technical/natural sciences

Publication information
Volume: 51
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.67 SJR 3.283 SNIP 2.674
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 3.542 SNIP 2.927 CiteScore 5.22
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 4.045 SNIP 3.348 CiteScore 5.16
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 3.29 SNIP 2.709 CiteScore 4.37
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 3.409 SNIP 2.917 CiteScore 4.28
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.247 SNIP 2.81 CiteScore 4.27
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 3.745 SNIP 2.724
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 3.677 SNIP 2.648
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 3.863 SNIP 2.787
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 3.298 SNIP 3.068
Web of Science (2007): Indexed yes
3DXRD - Mapping grains and their dynamics in 3 dimensions

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 2003
Event: Abstract from Conference on modern methods for quantitative metallography, Stockholm (SE), 5-6 Nov, .
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 306118
Publication: Research › Conference abstract for conference – Annual report year: 2003

3DXRD microscopy

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Number of pages: 1
Publication date: 2003

Host publication information
Title of host publication: Abstract booklet
Place of publication: Hamburg
Publisher: DESY
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 306106
Publication: Research › Conference abstract in proceedings – Annual report year: 2003

3DXRD microscopy (invited talk)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
3D-XRD microscopy observations on the processes that determine the metallic microstructure

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Sietsma, J. (Ekstern), Offerman, E. (Ekstern), Kruijver, S. (Ekstern), Zhao, L. (Ekstern), Dijk, N. V. (Ekstern), Zwaag, S. V. D. (Ekstern), Poulsen, H. (Intern), Lauridsen, E. (Intern), Margulies, L. (Intern), Grigull, S. (Ekstern)
Number of pages: 3
Publication date: 2003

A reconstruction method for generation of 3D grain maps

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Fu, X. (Intern), Poulsen, H. (Intern), Schmidt, S. (Ekstern)
Number of pages: 5
Publication date: 2003

A six-dimensional approach to microstructure analysis

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Pages: 2761-2778
Publication date: 2003
Main Research Area: Technical/natural sciences
Charge-density analysis of YBa$_2$Cu$_3$O$_{6.98}$: Comparison of theoretical and experimental results

General information
State: Published
Generation of grain maps by an algebraic reconstruction technique

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Grain rotation measurements during plastic deformation of polycrystals

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Margulies, L. (Intern), Schmidt, S. (Ekstern), Winther, G. (Intern), Poulsen, H. (Intern)
Number of pages: 37
Publication date: 2003

Host publication information
Title of host publication: Abstract booklet
Place of publication: Hamburg
Publisher: DESY
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 306115
Publication: Research › Conference abstract in proceedings – Annual report year: 2003

In situ characterisation of thermomechanical processes

General information
State: Published
Organisations: Materials Research Division, Risø National Laboratory for Sustainable Energy
Pages: 186-192
Publication date: 2003

Host publication information
Title of host publication: Conference proceedings
Place of publication: Sheffield
Publisher: University of Sheffield, Department of Engineering Materials
Editors: Palmiere, E., Mahfouf, M., Pinna, C.
ISBN (Print): 0-9522507-3-X
Main Research Area: Technical/natural sciences
Conference: International Conference on Thermomechanical Processing, Sheffield, United Kingdom, 23/06/2002 - 23/06/2002
Source: orbit
Source-ID: 306014
Publication: Research › Article in proceedings – Annual report year: 2003

In-situ observation of highly strained aluminium microstructure dynamics during annealing by 3DXRD microscopy

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Bowen, J. (Ekstern), Gundlach, C. (Intern), Doherty, R. (Ekstern), Poulsen, H. (Intern)
Number of pages: 23
Publication date: 2003
In situ observations on the mechanical stability of austenite in TRIP-steel

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Kruijver, S. (Ekstern), Zhao, L. (Ekstern), Sietsma, J. (Ekstern), Offerman, S. (Ekstern), Dijk, N. V. (Ekstern), Lauridsen, E. (Intern), Margulies, L. (Intern), Grigull, S. (Ekstern), Poulsen, H. (Intern), Zwaag, S. V. D. (Ekstern)
Pages: 499-502
Publication date: 2003
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal de Physique IV
Volume: 104
ISSN (Print): 1155-4339
Ratings:
BFI (2008): BFI-level 1
Web of Science (2005): Indexed yes
Web of Science (2004): Indexed yes
Web of Science (2003): Indexed yes
Web of Science (2002): Indexed yes
Web of Science (2000): Indexed yes
Original language: English
Source: orbit
Source-ID: 305644
Publication: Research - peer-review › Journal article – Annual report year: 2003

In-situ single grain X-ray peak profile measurements during plastic deformation of metals

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Pantleon, W. (Intern), Poulsen, H. (Intern), Almer, J. (Ekstern), Lienert, U. (Ekstern)
Number of pages: 105
Publication date: 2003

Host publication information
Title of host publication: Fundamental aspects of the deformation and fracture of materials. Book of abstracts
Place of publication: Budapest
Publisher: ICSMA
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 305838
Publication: Research › Conference abstract in proceedings – Annual report year: 2003

In-situ single grain X-ray peak profile measurements during plastic deformation of metals

General information
State: Published
Lattice rotations of individual bulk grains. Part 1: 3D X-ray characterization

Three-dimensional X-ray diffraction has been applied to characterise the plastic deformation of individual grains deeply embedded in a 99.6% pure aluminium specimen. The specimen is 4 mm thick with an average grain size of 75 μm. The average lattice rotation for each grain as well as the degree of internal orientation spread within the grain is measured in situ during 6% elongation. The rotation paths for 95 grains with nearly random initial orientations are reported. The quality of this data set is sufficient to make distinctions between plasticity models. The rotation paths exhibit a clear dependence on the initial orientation, while the influence of grain interaction is relatively small. All grains deform plastically. Averaged over grains and reflections the rotation of the tensile axis and the FWHM of the internal spread is 2.0 and 0.8°, respectively, at 6% strain.

General information

State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Margulies, L. (Intern), Schmidt, S. (Ekstern), Winther, G. (Intern)
Pages: 3821-3830
Publication date: 2003
Main Research Area: Technical/natural sciences

Publication information
Journal: ACTA MATERIALIA
Volume: 51
Issue number: 13
ISSN (Print): 1359-6454
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.67 SJR 3.283 SNIP 2.674
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 3.542 SNIP 2.927 CiteScore 5.22
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 4.045 SNIP 3.348 CiteScore 5.16
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 3.29 SNIP 2.709 CiteScore 4.37
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 3.409 SNIP 2.917 CiteScore 4.28
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.247 SNIP 2.81 CiteScore 4.27
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Measurements of plastic displacement gradient components in three dimensions using marker particles and synchrotron X-ray absorption microtomography

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Fæster Nielsen, S. (Intern), Poulsen, H. F. (Intern), Beckmann, F. (Ekstern), Thorning, C. (Ekstern), Wert, J. (Ekstern)
Pages: 2407-2415
Publication date: 2003
Main Research Area: Technical/natural sciences

Publication information
Volume: 51

Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.67 SJR 3.283 SNIP 2.674
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 3.542 SNIP 2.927 CiteScore 5.22
Non-destructive mapping of grains in three dimensions

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division
Oxygen-ordering superstructures in underdoped $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ studied by hard X-ray diffraction

High-energy x-ray diffraction is used to investigate the bulk oxygen-ordering properties of $\text{YBa}(2)\text{Cu}(3)\text{O}(6+x)$. Four different superstructures of Cu-O chains aligned along the b axis and ordered with periodicity ma, along the a axis have been observed. For $x<0.62$, the only observed superstructure is ortho-II with $m=2$. At room temperature, we find ortho-III ($m=3$) for $0.72 < x < 0.82$, ortho-V ($m=5$) in a mixed state with ortho-II at $x=0.62$, and ortho-VIII ($m=8$) at $x=0.67$. Ortho-II is a three-dimensional ordered structural phase, the remaining ones are essentially two-dimensional. None of the superstructures develops long-range ordering. The temperature dependence of the observed superstructure ordering is investigated explicitly and a structural phase diagram is presented.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Zimmermann, M. V. (Ekstern), Schneider, J. (Ekstern), Frello, T. (Ekstern), Andersen, N. (Intern), Madsen, J. (Ekstern), Käll, M. (Ekstern), Poulsen, H. (Intern), Liang, R. (Ekstern), Dosanjh, P. (Ekstern), Hardy, W. (Ekstern)
Number of pages: 13
Pages: 104515
Publication date: 2003
Main Research Area: Technical/natural sciences

Publication information
Journal: Physical Review B Condensed Matter
Volume: 68
Issue number: 10
ISSN (Print): 0163-1829
Ratings:
Web of Science (2018): Indexed yes
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.16
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.933 SNIP 0.94 CiteScore 2.8
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.667 SNIP 1.262 CiteScore 3.3
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.785 SNIP 1.339 CiteScore 3.55
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 3.206 SNIP 1.394 CiteScore 3.57
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.382 SNIP 1.438 CiteScore 3.61
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 3.417 SNIP 1.451
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 3.109 SNIP 1.474
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.982 SNIP 1.524
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 2.923 SNIP 1.546
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.796 SNIP 1.56
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 2.763 SNIP 1.607
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 2.742 SNIP 1.606
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 2.75 SNIP 1.536
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 2.788 SNIP 1.706
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 2.946 SNIP 1.635
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 2.986 SNIP 1.631
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 3.115 SNIP 1.58
Original language: English
DOIs: 10.1103/PhysRevB.68.104515
Source: orbit
Source-ID: 305967
Publication: Research - peer-review › Journal article – Annual report year: 2003

Reconstruction algorithms at the 3DXRD microscope - an overview

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Schmidt, S. (Ekstern), Fu, X. (Intern), Lauridsen, E. (Intern), Nielsen, S. (Ekstern), Suter, R. (Ekstern), Poulsen, H. (Intern)
Number of pages: 4
Publication date: 2003

Host publication information
Title of host publication: Abstract booklet
Place of publication: Hamburg
Publisher: DESY
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 306108
Publication: Research › Conference abstract in proceedings – Annual report year: 2003
Reconstruction of grain boundaries in polycrystals by filtered back-projection of diffraction spots

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Schmidt, S. (Ekstern)
Pages: 319-325
Publication date: 2003
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Journal of Applied Crystallography
Volume: 36
ISSN (Print): 0021-8898
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.51 SJR 1.242 SNIP 1.234
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.322 SNIP 2.588 CiteScore 3.97
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.585 SNIP 4.371 CiteScore 4.76
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.921 SNIP 6.392 CiteScore 6
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.572 SNIP 4.687 CiteScore 4.67
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.015 SNIP 5.863 CiteScore 5.32
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.6 SNIP 2.078
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 3.235 SNIP 2.117
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.126 SNIP 2.101
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.674 SNIP 3.489
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.112 SNIP 7.433
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.817 SNIP 2.339
Scopus rating (2004): SJR 1.618 SNIP 2.239
Web of Science (2004): Indexed yes
Recrystallization kinetics of individual bulk grains in 90 % cold-rolled aluminium

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division
Pages: 4423-4435
Publication date: 2003
Main Research Area: Technical/natural sciences

Publication information
Volume: 51
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.67 SJR 3.283 SNIP 2.674
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 3.542 SNIP 2.927 CiteScore 5.22
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 4.045 SNIP 3.348 CiteScore 5.16
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 3.29 SNIP 2.709 CiteScore 4.37
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 3.409 SNIP 2.917 CiteScore 4.28
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.247 SNIP 2.81 CiteScore 4.27
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 3.745 SNIP 2.724
Recrystallization kinetics of individual bulk grains in a commercial aluminium alloy

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division
Number of pages: 7
Publication date: 2003

Host publication information
Title of host publication: Abstract booklet
Place of publication: Hamburg
Publisher: DESY
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 305796
Publication: Research - peer-review › Journal article – Annual report year: 2003

Simultaneous measurement of the strain tensor of 10 individual grains embedded in an Al tensile sample

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Martins, R. (Ekstern), Margulies, L. (Intern), Schmidt, S. (Ekstern), Poulsen, H. (Intern), Leffers, T. (Intern)
Number of pages: 17
Publication date: 2003
Single grain peak profile measurements within bulk metals during tensile deformation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Almer, J. (Ekstern), Pantleon, W. (Intern), Poulsen, H. (Intern)
Number of pages: 14
Publication date: 2003

Host publication information
Title of host publication: Abstract booklet
Place of publication: Hamburg
Publisher: DESY
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 306113
Publication: Research › Conference abstract in proceedings – Annual report year: 2003

Status and perspectives of combined 3D imaging and diffraction experiments at the ESRF

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Ludwig, W. (Ekstern), Buffière, J. (Ekstern), Maire, E. (Ekstern), Preuss, M. (Ekstern), Cloetens, P. (Ekstern), Nielsen, S. (Ekstern), Poulsen, H. (Intern)
Number of pages: 44
Publication date: 2003

Host publication information
Title of host publication: Abstract booklet
Place of publication: Hamburg
Publisher: DESY
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 306116
Publication: Research › Conference abstract in proceedings – Annual report year: 2003

Structural refinements of the individual grains within polycrystals and powders

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Schmidt, S. (Ekstern), Poulsen, H. (Intern), Vaughan, G. (Ekstern)
Pages: 326-332
Publication date: 2003
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Applied Crystallography
Volume: 36
<table>
<thead>
<tr>
<th>Year</th>
<th>BFI (Level)</th>
<th>Scopus Rating</th>
<th>Web of Science Indexed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>BFI-level 2</td>
<td>CiteScore 2.51, SJR 1.242, SNIP 1.234</td>
<td>Yes</td>
</tr>
<tr>
<td>2017</td>
<td>BFI-level 1</td>
<td>SJR 2.322, SNIP 2.588, CiteScore 3.97</td>
<td>Yes</td>
</tr>
<tr>
<td>2016</td>
<td>BFI-level 1</td>
<td>SJR 2.585, SNIP 4.371, CiteScore 4.76</td>
<td>Yes</td>
</tr>
<tr>
<td>2015</td>
<td>BFI-level 2</td>
<td>SJR 3.015, SNIP 5.863, CiteScore 5.32</td>
<td>Yes</td>
</tr>
<tr>
<td>2014</td>
<td>BFI-level 2</td>
<td>SJR 3.235, SNIP 2.117</td>
<td>Yes</td>
</tr>
<tr>
<td>2013</td>
<td>BFI-level 2</td>
<td>SJR 2.126, SNIP 2.101</td>
<td>Yes</td>
</tr>
<tr>
<td>2012</td>
<td>BFI-level 2</td>
<td>SJR 1.674, SNIP 3.489</td>
<td>Yes</td>
</tr>
<tr>
<td>2011</td>
<td>BFI-level 2</td>
<td>SJR 2.112, SNIP 7.433</td>
<td>Yes</td>
</tr>
<tr>
<td>2010</td>
<td>BFI-level 2</td>
<td>SJR 1.817, SNIP 2.339</td>
<td>Yes</td>
</tr>
<tr>
<td>2009</td>
<td>BFI-level 2</td>
<td>SJR 1.618, SNIP 2.239</td>
<td>Yes</td>
</tr>
<tr>
<td>2008</td>
<td>BFI-level 2</td>
<td>SJR 1.206, SNIP 1.618</td>
<td>Yes</td>
</tr>
<tr>
<td>2007</td>
<td>BFI-level 2</td>
<td>SJR 2.31, SNIP 2.589</td>
<td>Yes</td>
</tr>
<tr>
<td>2006</td>
<td>BFI-level 2</td>
<td>SJR 1.7, SNIP 2.059</td>
<td>Yes</td>
</tr>
<tr>
<td>2005</td>
<td>BFI-level 2</td>
<td>SJR 1.09, SNIP 2.005</td>
<td>Yes</td>
</tr>
<tr>
<td>2004</td>
<td>BFI-level 2</td>
<td>SJR 1.269, SNIP 1.49</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Original language: English

DOI: 10.1107/S002188903002383
**Study of recovery in cold rolled Al using the 3DXRD microscope**

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Gundlach, C. (Intern), Poulsen, H. (Intern), Pantleon, W. (Intern)
Number of pages: 53
Publication date: 2003

**Host publication information**
Title of host publication: Abstract booklet
Place of publication: Hamburg
Publisher: DESY
Main Research Area: Technical/natural sciences

**Superconductivity in an anomalously tetragonal YB_2C_3O_{6.62} single crystal: A possible singularity in the structural phase diagram**
During systematic studies of the structural phase diagram of YBa_2Cu_3O_6+x (YBCO), a YBCO single crystal of oxygen concentration x=0.62 turned out to have a tetragonal crystal structure. By magneto-optical imaging of the expulsion of an applied magnetic field, it was shown that the sample was bulk superconducting. This makes the sample highly anomalous in two respects: with a stoichiometry of YBa_2Cu_3O_{6.62} the sample should have an orthorhombic symmetry, and a tetragonal undoped sample should not be superconducting at all. Our results corroborate previous findings of Topnikov [JETP Lett. 46, 577 (1987)] of a tetragonal superconducting YBCO crystal with x=0.62.

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Frello, T. (Ekstern), Andersen, N. (Intern), Baziljevich, M. (Ekstern), Johansen, T. (Ekstern), Grivel, J. (Intern), Poulsen, H. (Intern), Zimmermann, M. V. (Ekstern), Schneider, J. (Ekstern), Liang, R. (Ekstern), Dosanjh, P. (Ekstern), Hardy, W. (Ekstern), Wolf, T. (Ekstern)
Number of pages: 5
Pages: 024509
Publication date: 2003
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Physical Review B Condensed Matter
Volume: 67
Issue number: 2
ISSN (Print): 0163-1829
Ratings:
Web of Science (2018): Indexed yes
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.16
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.933 SNIP 0.94 CiteScore 2.8
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.667 SNIP 1.262 CiteScore 3.3
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.785 SNIP 1.339 CiteScore 3.55
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 3.206 SNIP 1.394 CiteScore 3.57
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.382 SNIP 1.438 CiteScore 3.61
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 3.417 SNIP 1.451
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 3.109 SNIP 1.474
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.982 SNIP 1.524
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 2.923 SNIP 1.546
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.796 SNIP 1.56
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 2.763 SNIP 1.607
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 2.742 SNIP 1.606
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 2.75 SNIP 1.536
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 2.788 SNIP 1.706
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 2.946 SNIP 1.635
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 2.986 SNIP 1.631
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 3.115 SNIP 1.58
Original language: English
DOIs: 10.1103/PhysRevB.67.024509
Source: orbit
Source-ID: 305377
Publication: Research - peer-review › Journal article – Annual report year: 2003

Synchrotron X-ray analysis of highly strained aluminium during in-situ annealing

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Bowen, J. (Ekstern), Gundlach, C. (Intern), Doherty, R. (Ekstern), Poulsen, H. (Intern)
Number of pages: 8
Publication date: 2003

Host publication information
Title of host publication: Abstract booklet
Place of publication: Hamburg
The three-dimensional X-ray diffraction microscope: 3D maps of grains and grain dynamics in polycrystalline materials

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division
Pages: 495-498
Publication date: 2003
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal de Physique IV
Volume: 104
ISSN (Print): 1155-4339
Ratings:
BFI (2008): BFI-level 1
Web of Science (2005): Indexed yes
Web of Science (2004): Indexed yes
Web of Science (2003): Indexed yes
Web of Science (2002): Indexed yes
Web of Science (2000): Indexed yes
Original language: English
Source: orbit
Source-ID: 305643
Publication: Research - peer-review → Journal article – Annual report year: 2003

3D røntgen mikroskopet

General information
State: Published
Organisations: Materials Research Division, Risø National Laboratory for Sustainable Energy
Authors: Schmidt, S. (Intern), Poulsen, H. (Intern), Juul Jensen, D. (Intern)
Pages: 103-114
Publication date: 2002

Host publication information
Title of host publication: Karakterisering af materialer - fra atom til makro
Place of publication: Lyngby
Publisher: DMS
Editors: Brøndsted, P., Somers, M.
ISBN (Print): 87-97535-31-9
Main Research Area: Technical/natural sciences
Conference: Dansk Metallurgisk Selskabs vintermøde 2002, Kolding, Denmark, 02/01/2002 - 02/01/2002
Source: orbit
Source-ID: 303721
Publication: Research › Article in proceedings – Annual report year: 2002

3DXRD - a novel tool for materials science

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Pages: 55-56
**3DXRD microscopy - a comparison with neutron diffraction**

3DXRD microscopy is a novel tool for fast and non-destructive characterisation of the individual grains and sub-grains inside bulk materials (powders or polycrystals). The method is based on diffraction with hard X-rays (E > 50 keV), enabling 3D studies of millimeter to centimeter-thick specimens. The position, volume, orientation, and elastic strain can be determined in hundreds of grains simultaneously. Furthermore, the evolution of the plastic strain can be characterised from grain rotations. Likewise, for coarse-grained materials, the topography of the grain boundaries can be mapped. The status of the technique is presented and the potential for in situ processing studies illustrated. The hard-X-ray method is compared to conventional neutron-diffraction techniques: texture and strain measurements, small-angle scattering, and in situ powder diffraction.
A computer simulating tool for 3DXRD microscope

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Fu, X. (Ekstern), Schmidt, S. (Intern), Poulsen, H. (Intern)
Pages: 29-30
Publication date: 2002

Host publication information
Title of host publication: Extended abstracts
Volume: Risø-R-1347(EN)
Editors: Bowen, J., Godfrey, A., Pantleon, W.
ISBN (Print): 87-550-3072-6
Main Research Area: Technical/natural sciences
Conference: 1st Joint Chinese-Danish Symposium, Qinhuangdao, China, 19/08/2002 - 19/08/2002
Source: orbit
Source-ID: 304525
Publication: Research › Conference abstract in proceedings – Annual report year: 2002

From 2D to 3D microtexture investigations

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Juul Jensen, D. (Intern)
Grain dynamics in Bi-2223 tapes measured by the 3DXRD microscope

It is demonstrated how a novel X-ray diffraction method can provide information on the structural dynamics of the individual grains inside a Bi-222-3/Ag tape. A microfocused beam of 80 keV X-rays provides both the necessary spatial resolution and penetration power for in situ studies. In a feasibility study at the European Synchrotron Radiation Facility a green mono-filamentary tape is annealed in air for 12 h at 838.5 degreesC. The Bi-2212 to Bi-2223 transformation is found to be a dynamical process during which individual Bi-2212 grains form, dissociate and "recrystallise" at different times throughout the annealing. The typical reaction time is 1 It. The potential of the method for classifying grains according to orientation, volume and stoichiometry is discussed. (C) 2001 Elsevier Science B.V. All rights reserved.
Grain maps by 3DXRD microscopy

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Schmidt, S. (Ekstern), Lauridsen, E. (Intern), Margulies, L. (Intern), Nielsen, S. (Ekstern)
Number of pages: 64
Publication date: 2002

Host publication information
Title of host publication: Programme. Abstracts. List of participants
Place of publication: Grenoble
Publisher: ESRF
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 304465
Publication: Research › Conference abstract in proceedings – Annual report year: 2002

Grain nucleation and growth during phase transformations
The mechanical properties of polycrystalline materials are largely determined by the kinetics of the phase transformations during the production process. Progress in x-ray diffraction instrumentation at synchrotron sources has created an opportunity to study the transformation kinetics at the level of individual grains. Our measurements show that the activation energy for grain nucleation is at least two orders of magnitude smaller than that predicted by thermodynamic models. The observed growth curves of the newly formed grains confirm the parabolic growth model but also show three fundamentally different types of growth. Insight into the grain nucleation and growth mechanisms during phase transformations contributes to the development of materials with optimal mechanical properties.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Offerman, S. (Ekstern), Dijk, N. V. (Ekstern), Sietsma, J. (Ekstern), Grigull, S. (Ekstern), Lauridsen, E. (Intern), Margulies, L. (Intern), Poulsen, H. (Intern), Rekveldt, M. (Ekstern), Zwaag, S. V. D. (Ekstern)
In-situ characterization of thermomechanical processes

General information
State: Published
Organisations: Materials Research Division, Risø National Laboratory for Sustainable Energy
Publication date: 2002
Event: Abstract from International Conference on Thermomechanical Processing, Sheffield, United Kingdom.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 304629
Publication: Research - peer-review › Journal article – Annual report year: 2002

In situ observations on the austenite stability in TRIP-steel during tensile testing

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Kruijver, S. (Ekstern), Sietsma, J. (Ekstern), Offerman, E. (Ekstern), Dijk, N. V. (Ekstern), Margulies, L. (Intern), Lauridsen, E. (Ekstern), Grigull, S. (Ekstern), Poulsen, H. (Intern), Zwaag, S. V. D. (Ekstern)
Pages: 236-241
Publication date: 2002
Main Research Area: Technical/natural sciences

Publication information
Journal: Steel Res.
Volume: 73
Original language: English
Source: orbit
Source-ID: 305016
Publication: Research › Conference abstract for conference – Annual report year: 2002

Lattice rotations of individual bulk grains during deformation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Winther, G. (Intern), Margulies, L. (Intern), Poulsen, H. (Intern), Schmidt, S. (Intern), Larsen, A. (Intern), Lauridsen, E. (Intern), Fæster Nielsen, S. (Intern), Terry, A. (Ekstern)
Pages: 287-292
Publication date: 2002
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Science Forum
Volume: 408-412
Microstructural dynamics of Bi-2223/Ag tapes annealed in 8% O₂
The microstructural dynamics of Bi-2223 tapes are investigated in situ during annealing in 8% O₂ by means of 100 keV x-ray diffraction. A green mono- and a green multi-filamentary tape are annealed at 829.5 degreesC. During ramp-up (Ca,Sr)(2)PbO₄ decomposes above 750 degreesC, resulting in an incorporation of Pb in Bi-2212. The associated grain growth of Bi-2212 is the main cause of the strain relief and the c-axis grain alignment of the Bi containing phases. Above 825 degreesC the Bi-2212 partly dissociates into (Ca,Sr)(14)Cu24Oₓ and a liquid phase. The linewidth of Bi-2212 is constant during the transformation to Bi-2223, indicating no strain or finite-size broadening. The most probable transformation mechanism is found to be nucleation and growth with a fast decomposition of the individual Bi-2212 grain, followed by a growth of Bi-2223 from the Bi-2212 melt reacting with (Ca,Sr)(14)Cu24Oₓ. The multi-filamentary tape transforms faster and exhibits a much better degree of c-axis alignment. Results are compared to similar studies in air. During a final annealing of a fully converted tape no change is found in the average concentration, stoichiometry and grain misalignment. A post-annealing experiment at 650 degreesC on quenched tapes shows a reaction over 3 weeks, whereby randomly oriented 3222 grains are formed and Bi-2223 is depleted of Pb. Simultaneously, the critical current decreases by a factor of 2.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, L. (Ekstern), Poulsen, H. (Intern), Abrahamsen, A. (Intern), Jacobsen, B. (Intern), Tschentscher, T. (Ekstern)
Pages: 190-201
Publication date: 2002
Main Research Area: Technical/natural sciences
Observation of high-resolution diffraction profiles from single grains within polycrystalline metals

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Almer, J. (Ekstern), Margulies, L. (Intern), Fæster Nielsen, S. (Intern), Pantleon, W. (Intern), Poulsen, H. (Intern), Schmidt, S. (Intern)
Publication date: 2002
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 303841
Publication: Research › Journal article – Annual report year: 2002

Recrystallization studies using the 3DXRD microscope

General information
State: Published
Organisations: Materials Research Division, Risø National Laboratory for Sustainable Energy
Pages: 43-44
Publication date: 2002

Host publication information
Title of host publication: Extended abstracts
Volume: Risø-R-1347(EN)
Editors: Bowen, J., Godfrey, A., Pantleon, W.
ISBN (Print): 87-550-3072-6
Main Research Area: Technical/natural sciences
Conference: 1st Joint Chinese-Danish Symposium, Qinhuangdao, China, 19/08/2002 - 19/08/2002
Source: orbit
Source-ID: 304530
Publication: Research › Conference abstract in proceedings – Annual report year: 2002
Strain tensor development in a single grain in the bulk of a polycrystal under loading

**General information**

State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Margulies, L. (Intern), Lorentzen, T. (Intern), Poulsen, H. (Intern), Leffers, T. (Intern)
Pages: 1771-1779
Publication date: 2002
Main Research Area: Technical/natural sciences

**Publication information**

Volume: 50
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.67 SJR 3.283 SNIP 2.674
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 3.542 SNIP 2.927 CiteScore 5.22
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 4.045 SNIP 3.348 CiteScore 5.16
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 3.29 SNIP 2.709 CiteScore 4.37
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 3.409 SNIP 2.917 CiteScore 4.28
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.247 SNIP 2.81 CiteScore 4.27
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 3.745 SNIP 2.724
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 3.677 SNIP 2.648
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 3.863 SNIP 2.787
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 3.298 SNIP 3.068
Web of Science (2007): Indexed yes
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 3.172 SNIP 3.082
Scopus rating (2004): SJR 3.066 SNIP 3.154
Structural refinement of the individual grains in a polycrystal

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Schmidt, S. (Intern), Vaughan, G. (Ekstern), Poulsen, H. (Intern)
Pages: 57-58
Publication date: 2002

Host publication information
Title of host publication: Extended abstracts
Volume: Risø-R-1347(EN)
Editors: Bowen, J., Godfrey, A., Pantleon, W.
ISBN (Print): 87-550-3072-6
Main Research Area: Technical/natural sciences
Conference: 1st Joint Chinese-Danish Symposium, Qinhuangdao, China, 19/08/2002 - 19/08/2002
Source: orbit
Source-ID: 304026
Publication: Research - peer-review › Journal article – Annual report year: 2002

A three-dimensional X-ray diffraction microscope for deformation studies of polycrystals

The microstructure in polycrystalline materials has mostly been studied in planar sections by microscopy techniques. Now the high penetration power of hard X-ray synchrotron radiation makes three-dimensional (3-D) observations possible in bulk material by back tracing the diffracted beam. The three-dimensional X-ray diffraction (3DXRD) microscope installed at the European Synchrotron Radiation Facility in Grenoble provides a fast and non-destructive technique for mapping the embedded grains within thick samples in three dimensions. All essential features like the position, volume, orientation, stress-state of the grains can be determined, including the morphology of the grain boundaries. The accuracy of this novel tracking technique is compared with electron microscopy (EBSP), and its 3-D capacity is demonstrated. (C) 2001 Elsevier Science B.V. All rights reserved.

General information
State: Published
Organisations: Materials Research Division, Risø National Laboratory for Sustainable Energy
Pages: 179-181
Publication date: Dec 2001
Main Research Area: Technical/natural sciences

Publication information
Volume: 319-321
Issue number: SI
ISSN (Print): 0921-5093
Ratings:

BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.39 SJR 1.666 SNIP 1.832
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.78 SNIP 1.849 CiteScore 3.01
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.285 SNIP 2.617 CiteScore 3.32
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.879 SNIP 2.231 CiteScore 2.86
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.737 SNIP 2.351 CiteScore 2.5
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.741 SNIP 2.406 CiteScore 2.59
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.702 SNIP 2.086
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.551 SNIP 1.74
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.678 SNIP 1.847
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.32 SNIP 1.68
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.337 SNIP 1.748
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.163 SNIP 1.448
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.167 SNIP 1.64
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.295 SNIP 1.606
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.248 SNIP 1.348
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 1.147 SNIP 1.347
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.086 SNIP 1.074
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.181 SNIP 1.049

Original language: English

high-energy synchrotron radiation, X-ray diffraction, deformation, in-situ measurement, three-dimensional mapping

DOIs:

10.1016/S0921-5093(01)01056-5
3d X-ray diffraction microscopy of materials (invited talk)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 2001
Event: Abstract from Gordon research conference on X-ray physics, Connecticut College, CT (US), 22-27 Jul,.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 302840
Publication: Research › Conference abstract for conference – Annual report year: 2001

3DXRD: A new tool for bridging the length scales in materials science

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 2001

Host publication information
Title of host publication: Conference programme and abstracts
Place of publication: Garching
Publisher: Technische Universität München
Editors: Neuhaus, J., Meyer, A.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 302843
Publication: Research › Conference abstract in proceedings – Annual report year: 2001

Direct observation of grain boundary wetting by synchrotron radiation imaging techniques

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Ludwig, W. (Ekstern), Fæster Nielsen, S. (Intern), Poulsen, H. (Intern), Bellet, D. (Ekstern)
Pages: 1319-1330
Publication date: 2001
Main Research Area: Technical/natural sciences

Publication information
Journal: Defect Diffus. Forum
Volume: 194
Original language: English
Source: orbit
Source-ID: 303064
Publication: Research - peer-review › Conference article – Annual report year: 2001

Growth kinetics of individual cube grains as studied by the 3D X-ray diffraction microscope

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lauridsen, E. (Intern), Schmidt, S. (Intern), Margulies, L. (Intern), Poulsen, H. (Intern), Juul Jensen, D. (Intern)
Pages: 589-594
Publication date: 2001
High spatial resolution strain measurements within bulk materials by slit-imaging

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals

In situ measurement of grain rotation during deformation of polycrystals
Mapping of grain boundaries in 3D

General information
State: Published
Organisations: Materials Research Division, Risø National Laboratory for Sustainable Energy
Publication date: 2001

Host publication information
Title of host publication: Programme. Abstracts. List of participants
Place of publication: Copenhagen
Publisher: HCØ Tryk
Main Research Area: Technical/natural sciences
Conference: 2001 Annual Meeting of The Danish Physical Society, Nyborg, Denmark, 31/05/2001 - 31/05/2001
Source: orbit
Source-ID: 302576
Publication: Research › Conference abstract in proceedings – Annual report year: 2001

Mesoscale structural characterization within bulk materials by high-energy X-ray microdiffraction
A novel diffraction technique for the local three-dimensional characterization within polycrystalline bulk materials is presented. The technique uses high-energy synchrotron radiation (40 keV < E < 100 keV), which penetrates deeply into materials. Focusing broadband optics have been developed that provide the required intensity and spatial resolution perpendicular to the incident beam. A focus size of 1.2 mum was achieved. Modified crossed-beam techniques are being developed that define the longitudinal resolution, i.e., the component of the gauge volume parallel to the incident beam. We present experimental evidence that a longitudinal resolution down to 10 mum can be obtained. Fundamental materials properties such as the strain/stress state, grain-orientation, -size, and -surface topology can be probed and mapped in three dimensions in favorable cases. Imbedded volumes and interfaces become accessible. The technique is nondestructive and allows for in situ studies of samples in complicated environments. A dedicated experimental station has been constructed at the ID11 beamline of the European Synchrotron Radiation Facility. On-line two-dimensional detectors and conical slits have been developed. Four examples of applications are presented.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Poulsen, H. (Intern), Kvick, Å. (Ekstern)
Pages: 919-923
Publication date: 2001
Main Research Area: Technical/natural sciences

Publication information
Journal: A I A A Journal
Volume: 39
Issue number: 5
ISSN (Print): 0001-1452
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.58 SJR 0.884 SNIP 1.672
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.883 SNIP 1.756 CiteScore 1.99
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.875 SNIP 1.754 CiteScore 2.28
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.976 SNIP 1.837 CiteScore 2.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Microstructural dynamics in Bi-2223/AG tapes

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, L. (Ekstern), Poulsen, H. (Intern)
Pages: 29-87
Publication date: 2001

Host publication information
Title of host publication: The BSCCO system - II
Place of publication: Huntington, NY
Publisher: Nova Science Publishers, Incorporated
Editor: Narlikar, A.

Series: Studies of High Temperature Superconductors, Vol. 36
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 302551
Publication: Research - peer-review › Journal article – Annual report year: 2001

Microstructural evolution at the initial stages of annealing in a Bi-2223 multifilament tape

The microstructural evolution at the initial stage of annealing in a multifilament Bi-2223 (2223) tape is studied in quenched samples using XRD, SEM and EDS. The annealing was carried out at 830 degreesC under reduced oxygen partial pressure. Samples were quenched in air upon reaching 830 degreesC, as well as after 1, 2, 5, 10, 30 and 52 h at 830
degreesC. It was found that the initial liquid formation was associated with alkaline-earth cuprate (AEC) particles such as (Ca,Sr)(14)Cu24Oz and (Ca,Sr)(2)CuO3. The liquid is rich of Pb and the AEC particles dissolve and supply Cu and Ca into the liquid through direct contact. The 2223 kinetics are well correlated with the structural parameters of liquid and AEC particles. During the first hour the liquid activity is confined to the neighbourhood of AEC particles and the rate of 2223 formation is very low. Between 2 and 10 h the liquid amount increases and the size (measured in tape plane) is comparable with the particle spacing indicating a liquid activity on an overall scale and sufficient feeding of Cu and Ca. Consequently, the 2223 develops at a fast rate. After 10 h the liquid amount is decreased, the particle spacing is far larger than the liquid size and the rate of 2223 formation slows down. The early 2223 forms as precipitates in the structure. The possible formation mechanisms are discussed.
Optimization of BSCCO/Ag tapes with the help of TEM

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Bals, S. (Ekstern), Tendeloo, G. V. (Ekstern), Andersen, L. (Ekstern), Liu, Y. (Ekstern), Poulsen, H. (Intern)
Publication date: 2001
Event: Abstract from Joint SCENET-Supercurrent workshop on high current superconductors for practical applications, Alpbach (AT), 8-10 Jun,
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 303356
Publication: Research - Conference abstract for conference – Annual report year: 2001

Plastic deformation and recrystallization studied by the 3D X-ray microscope

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Juul Jensen, D. (Intern), Kvick, Å. (Ekstern), Lauridsen, E. (Intern), Lienert, U. (Ekstern), Margulies, L. (Intern), Fæster Nielsen, S. (Intern), Poulsen, H. (Intern)
Pages: 227-240
Publication date: 2001

Host publication information
Title of host publication: Applications of synchrotron radiation techniques to materials science 5
Place of publication: Warrendale, PA
Publisher: Materials Research Society
Editors: Stock, S., Perry, D., Mini, S.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 302511
Publication: Research - Article in proceedings – Annual report year: 2001
Quantification of minor texture components by hard X-rays

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Pages: 39-54
Publication date: 2001
Main Research Area: Technical/natural sciences

Publication information
Journal: Textures and Microstructures
Volume: 35
ISSN (Print): 0730-3300
Original language: English
Source: orbit
Source-ID: 303333
Publication: Research - peer-review › Journal article – Annual report year: 2001

Relation between texture and critical current density of textured YBa$_2$Cu$_3$O$_x$ plates

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Larsen, B. (Ekstern), Larsen, J. (Ekstern), Abrahamsen, A. (Intern), Poulsen, H. (Intern), Tschentscher, T. (Ekstern), Christiansen, J. (Ekstern), Andersen, N. (Intern)
Pages: 3513-3516
Publication date: 2001
Main Research Area: Technical/natural sciences

Publication information
Journal: IEEE Transactions on Applied Superconductivity
Volume: 11
ISSN (Print): 1051-8223
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.42 SJR 0.395 SNIP 1.031
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.35 SNIP 0.935 CiteScore 1.27
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.47 SNIP 1.113 CiteScore 0.83
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.431 SNIP 1.171 CiteScore 1.32
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.575 SNIP 1.27 CiteScore 1.11
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.364 SNIP 1.063 CiteScore 1.16
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
Source size conserving broad band monochromators of fixed exit geometry for high energy synchrotron radiation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Keitel, S. (Ekstern), Caliebe, W. (Ekstern), Schulze-Briese, C. (Ekstern), Poulsen, H. (Intern)
Pages: 659-662
Publication date: 2001
Main Research Area: Technical/natural sciences

Publication information
Volume: 467-468
ISSN (Print): 0168-9002
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.44 SJR 0.916 SNIP 1.352
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.915 SNIP 1.334 CiteScore 1.21
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.852 SNIP 1.303 CiteScore 1.24
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.944 SNIP 1.398 CiteScore 1.48
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.806 SNIP 1.071 CiteScore 1.19
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.918 SNIP 1.424 CiteScore 1.29
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.893 SNIP 1.113
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.75 SNIP 1.386
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.753 SNIP 1.073
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.716 SNIP 1.383
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.818 SNIP 1.108
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.819 SNIP 1.156
Scopus rating (2004): SJR 0.844 SNIP 1.489
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 0.673 SNIP 1.226
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 0.628 SNIP 1.108
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 0.688 SNIP 1.104
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 0.594 SNIP 0.974
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 0.754 SNIP 1.006
Original language: English
Source: orbit
Source-ID: 302873
Publication: Research - peer-review › Journal article – Annual report year: 2001

Surface science with SR

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 2001
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 302842
Publication: Research › Conference abstract for conference – Annual report year: 2001

Three-dimensional maps of grain boundaries and the stress state of individual grains in polycrystals and powders
Three dimensional strain measurements in bulk materials with high spatial resolution

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Grigull, S. (Ekstern), Kvick, Å. (Ekstern), Martins, R. (Ekstern), Poulsen, H. (Intern)
Pages: 1050-1057
Publication date: 2001

Host publication information
Title of host publication: 6. International conference on residual stresses. Proceedings
Place of publication: London
Publisher: Institute of Materials
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 302513
Publication: Research - peer-review › Article in proceedings – Annual report year: 2001

Tracking: A method for structural characterization of grains in powders or polycrystals

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lauridsen, E. (Intern), Schmidt, S. (Intern), Suter, R. (Ekstern), Poulsen, H. (Intern)
Pages: 744-750
Publication date: 2001

Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Applied Crystallography
Volume: 34
ISSN (Print): 0021-8898
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.51 SJR 1.242 SNIP 1.234
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.322 SNIP 2.588 CiteScore 3.97
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.585 SNIP 4.371 CiteScore 4.76
Transmission electron microscopy investigation of Bi-2223/Ag tapes

The microstructure of (Bi,Pb)(2)Sr2Ca2CuOx (Bi-2223) tapes has been investigated by means of transmission electron microscopy (TEM) and high-resolution TEM. The emphasis has been placed on: (1) an examination of the grain morphology and size, (2) grain and colony boundary angles, which are formed during the tape processing, (3) a study of the grain boundaries on an atomic scale, including intergrowth investigations. Tapes with different process parameters have been compared with respect to the microstructure. A fully processed tape has on the average 50% thicker Bi-2223 grains than a tape after the first annealing. The angles of c-axis tilt grain boundaries are on average 14 degrees and 26 degrees for the fully processed tape and the tape after the first annealing, respectively. (C) 2001 Elsevier Science B.V. All rights reserved.

General information
State: Published
X-ray microscopy. Imaging

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 2001
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 302841
Publication: Research › Conference abstract for conference – Annual report year: 2001

3D characterization of grains in powders or polycrystals

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Kvick, Å. (Ekstern)
Pages: vp.
Publication date: 2000
Main Research Area: Technical/natural sciences
Publication information
Issue number: 24
Original language: English
Source: orbit
Source-ID: 302515
Publication: Communication › Journal article – Annual report year: 2001

A conical slit for three-dimensional XRD mapping

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Fæster Nielsen, S. (Intern), Wolf, A. (Ekstern), Poulsen, H. (Intern), Ohler, M. (Ekstern), Lienert, U. (Ekstern), Owen, R. (Ekstern)
Pages: 103-109
Publication date: 2000
Main Research Area: Technical/natural sciences
Publication information
Journal: Journal of Synchrotron Radiation
Volume: 7
ISSN (Print): 0909-0495
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
A high energy microscope for local strain measurements within bulk materials

A novel diffraction technique for local, three dimensional strain scanning within bulk materials is presented. The technique utilizes high energy, micro-focussed synchrotron radiation which can penetrate several millimeters into typical metals. The spatial resolution can be as narrow as 1 mum in one dimension and in three dimensions about 5x10x100 mum(3) Bulk properties are probed non-destructively and in-situ measurements during thermo-mechanical processing are feasible. A dedicated experimental station has been constructed at the ID11 beamline of the European Synchrotron Radiation Facility. Case studies demonstrate that steep macrostrain gradients can be resolved. Techniques for the local measurement of macro- and microstrains are discussed.
Anisotropic dynamical scaling in a weakly 3D system: The case of oxygen ordering in YBa$_2$Cu$_3$O$_{6.5}$

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Käll, M. (Ekstern), Zimmermann, M. V. (Ekstern), Andersen, N. (Ekstern), Madsen, J. (Ekstern), Frello, T. (Intern), Poulsen, H. (Intern), Schneider, J. (Ekstern), Wolf, T. (Ekstern)
Pages: 447-453
Publication date: 2000
Main Research Area: Technical/natural sciences

Publication information
Journal: Europhysics Letters
Volume: 51
ISSN (Print): 0295-5075
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 1.18 SJR 0.523 SNIP 0.597
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.584 SNIP 0.628 CiteScore 1.12
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 0.547 SNIP 0.593 CiteScore 1.04
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 0.537 SNIP 0.54 CiteScore 1
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 0.809 SNIP 0.606 CiteScore 1.28
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Application of high-energy synchrotron radiation for texture studies

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Pages: 364-371
Publication date: 2000
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Applied Crystallography
Volume: 33
ISSN (Print): 0021-8898
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.51 SJR 1.242 SNIP 1.234
Web of Science (2016): Indexed yes
A three-dimensional X-ray diffraction microscope for deformation studies of polycrystals

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Nielsen, F. (Ekstern), Lauridsen, E. (Intern), Juul Jensen, D. (Intern), Poulsen, H. (Intern)
Number of pages: 16
Publication date: 2000
Host publication information
Title of host publication: Abstract booklet
Place of publication: [s.l.]
Publisher: [s.n.]
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 301792
Publication: Research › Conference abstract in proceedings – Annual report year: 2000

Characterization of deformation structure and recrystallization in a tensile deformed [110] aluminum single crystal

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Huang, X. (Intern), Wert, J. (Ekstern), Poulsen, H. (Intern), Krieger Lassen, N. (Ekstern), Inoko, F. (Ekstern)
Pages: 359-364
Publication date: 2000

Host publication information
Title of host publication: Recrystallization - Fundamental aspects and relations to deformation microstructure. Proceedings
Place of publication: Roskilde
Publisher: Risø National Laboratory
ISBN (Print): 87-550-2737-7
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 301317
Publication: Research › Article in proceedings – Annual report year: 2000

Kinetics of individual grains during recrystallization

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lauridsen, E. (Intern), Juul Jensen, D. (Intern), Poulsen, H. (Intern), Lienert, U. (Ekstern)
Pages: 561-566
Publication date: 2000
Main Research Area: Technical/natural sciences

Publication information
Journal: Scripta Materialia
Volume: 43
ISSN (Print): 1359-6462
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.71 SJR 1.901 SNIP 1.696
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.3 SNIP 1.876 CiteScore 3.54
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.744 SNIP 2.124 CiteScore 3.55
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Recrystallization in 3D

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Juul Jensen, D. (Intern), Poulsen, H. (Intern)
Pages: 103-124
Publication date: 2000

Host publication information
Title of host publication: Recrystallization - Fundamental aspects and relations to deformation microstructure. Proceedings
Place of publication: Roskilde
Three dimensional mapping of grain boundaries

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Pages: 473-478
Publication date: 2000

Host publication information
Title of host publication: Recrystallization - Fundamental aspects and relations to deformation microstructure. Proceedings
Place of publication: Roskilde
Publisher: Risø National Laboratory
ISBN (Print): 87-550-2737-7
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 301322
Publication: Research › Article in proceedings – Annual report year: 2000

Three dimensional maps of polycrystalline materials

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Publication date: 2000

Host publication information
Title of host publication: Programme and abstracts
Place of publication: Copenhagen
Publisher: Centre for Crystallographic Studies
Main Research Area: Technical/natural sciences
Conference: 31. Danske krystallografmøde; Dansync's 3. Årsmøde, København, Denmark, 30/05/2000 - 30/05/2000
Source: orbit
Source-ID: 301201
Publication: Research › Conference abstract in proceedings – Annual report year: 2000

A focusing multilayer analyser for local diffraction studies

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Poulsen, H. (Intern), Honkimäki, V. (Ekstern), Schulze, C. (Ekstern), Hignette, O. (Ekstern)
Pages: 979-984
Publication date: 1999
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Synchrotron Radiation
Volume: 6
ISSN (Print): 0909-0495
A high energy X-ray microscope for the local structural characterization of bulk materials

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Kvick, A. (Ekstern), Poulsen, H. (Intern)
An in situ study of the annealing behaviour of BiSCCO Ag tapes

The phase transformations and structural changes occurring during initial heating and annealing of an Ag-clad high-T-c superconducting tape of the (Bi, Pb)(2)Sr2Ca2Cu3Ox type are investigated. The annealing takes place in air at an operating temperature of 835 degrees C. Using x-ray diffraction with 100 keV photons from a synchrotron source the concentration, stoichiometry and texture of the dominant phases are monitored in situ during the transformation of BiSCCO from (Bi, Pb)(2)Sr2CaCu2Ox, (2212) to (Bi, Pb)(2)Sr2Ca2Cu3Ox, (2223). In addition, information on grain size and residual strain is obtained. During heating the (Ca, Sr)(2)PbO4 additive decomposes between 700 degrees C and 820 degrees C. Simultaneously, the residual strain in the 2212 grains is relieved and the c-axis alignment of the grains is substantially improved. Moreover, the Pb content of the 2212 structure increases continuously. We interpret these results as being related to a temperature-dependent solubility limit of Pb in 2212, leading to a substantial grain growth of the phase. Above 812 degrees C 2212 partly decomposes to form (Ca, Sr)(2)CuO3 and a liquid. At the operating temperature 2212 and (Ca, Sr)(2)CuO3 react with the liquid to form 2223. During the conversion the 2212 lattice expands, indicating that the remaining 2212 grains contain less and less Pb. The final 2212 and 2223 textures are approximately identical, and Avrami plots of the transformation kinetics give exponents m in the range 1 < m < 2. During the annealing the 2212 linewidth is constant, implying that there is neither strain nor finite-size broadening of the 2212 peaks during the transformation. This points to a transformation mechanism where only a few 2212 grains transform at a given time. Implications of these findings are discussed in relation to intercalation and nucleation-and-growth models.
Comparison of experimental techniques for characterization of through-thickness texture variations

For the investigation of through-thickness texture gradients, a number of layers in rolled plates and sheets are inspected. Crystallographic textures in different layers can be characterized using several techniques. In the present work, traditional low-energy X-ray diffraction, the electron backscattering pattern technique in the scanning electron microscope and a novel technique which involves high energy synchrotron radiation are used for characterization of through-thickness texture variations in commercial purity cold-rolled aluminium. Important experimental aspects of these three techniques are described. The results from the three techniques are compared and their potentials for characterization of through-thickness texture variations are considered.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Pages: 174-179
Cooling studies of BSCCO/Ag tapes in 8% oxygen

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, L. (Ekstern), Liu, Y. (Ekstern), Grivel, J. (Ekstern), Poulsen, H. (Intern), Wang, W. (Ekstern)
Number of pages: 84
Publication date: 1999

Host publication information
Title of host publication: Programme. Technical sessions. Exhibition. Abstracts
Place of publication: Sitges
Publisher: Organisation Committee of EUCAS '99
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 299547
Publication: Research › Conference abstract in proceedings – Annual report year: 1999

High energy synchrotron strain scanning on highly plastically deformed torsion samples

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Martins, R. (Ekstern), Kvick, Å. (Ekstern), Lienert, U. (Ekstern), Poulsen, H. (Intern), Pyzalla, A. (Ekstern)
Pages: 411-416
Publication date: 1999

Host publication information
Title of host publication: Deformation-induced microstructures: Analysis and relation to properties. Proceedings
Place of publication: Roskilde
Publisher: Risø National Laboratory
Editors: Bilde-Sorensen, J., Carstensen, J., Hansen, N., Juul Jensen, D., Leffers, T., Panteleon, W., Pedersen, O., Winther, G.
ISBN (Print): 87-550-2592-7
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 299981
In situ study of equilibrium phenomena and kinetics in a BiSCCO Ag tape

Structural changes during the annealing of a mono-filament BiSCCO/Ag tape in air are monitored in situ by synchrotron X-ray diffraction. Starting at 750 degrees C, a very slow ramp rate is used, followed by high temperature cycling to study equilibrium phenomena and kinetics. For the first time, the concentration of the partial liquid is directly monitored. A 3321 phase dissolves below 790 degrees C. Between 760 degrees C and 820 degrees C, the 2212 lattice parameters contract, indicating incorporation of Pb and/or Ca. At the same time, grain growth takes place, relieving strains. Between 820 degrees C and 840 degrees C (Ca,Sr)(2)PbO4 dissolves incongruously, while the amount of liquid increases. Conversion of 2212 to 2223 takes place at all temperatures above 820 degrees C. Above 833 degrees C, (Ca,Sr)(2)CuO3 appears. Cycling between 845 degrees C and 860 degrees C, where 2212 has almost disappeared, reveals fast, nearly reversible changes, indicative of several eutectics involving the 2212, 2223, (Ca,Sr)(2)CuO3 and liquid phases. By cycling, the incorporated Ca and/or Pb is lost irreversibly. Cooling data are consistent with precipitation of 2212 and 2223 by layer-on-layer growth on the existing grains. Some comments on growth models and a comparison to similar annealing experiments with constant operation temperature are given. (C) 1999 Elsevier Science B.V. All rights reserved.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Andersen, L. (Ekstern), Frello, T. (Intern), Prantontep, S. (Ekstern), Andersen, N. (Intern), Garbe, S. (Ekstern), Madsen, J. (Ekstern), Abrahamsen, A. (Intern), Bentzon, M. (Ekstern), Zimmermann, M. V. (Ekstern)
Pages: 254-262
Publication date: 1999
Main Research Area: Technical/natural sciences

Publication information
Journal: Physica C: Superconductivity and its Applications
Volume: 315
Issue number: 3-4
ISSN (Print): 0921-4534
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.14 SJR 0.575 SNIP 0.924
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.446 SNIP 0.888 CiteScore 0.99
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.497 SNIP 0.83 CiteScore 0.85
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.439 SNIP 0.7 CiteScore 0.79
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.55 SNIP 0.621 CiteScore 0.79
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.652 SNIP 0.607 CiteScore 0.94
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.63 SNIP 0.631
Web of Science (2010): Indexed yes
Local strain measurement techniques in bulk materials

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Grigull, S. (Ekstern), Kvick, A. (Ekstern), Martins, R. (Ekstern), Poulsen, H. (Intern), Lauridsen, E. (Intern), Faæster, S. (Intern)
Pages: 293-294
Publication date: 1999

Host publication information
Title of host publication: Abstracts
Place of publication: Warrendale
Publisher: Materials Research Society
Main Research Area: Technical/natural sciences
Conference: MRS 1999 Fall meeting, Boston, MA, United States, 29/11/1999 - 29/11/1999

Materials science applications of high energy synchrotron radiation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Number of pages: 27
Publication date: 1999

Host publication information
Title of host publication: Collected abstracts
Microstructure, texture and critical current of Ag-sheathed 2223 multifilament tapes
An Ag-sheathed 2223 multifilament tape was produced by the powder-in-tube method. The various parts of the tape were heat treated at different temperatures under reduced oxygen partial pressure. The microstructure and the texture were characterized by synchrotron x-ray diffraction and SEM and correlated with J(c). In the low temperature range (<826 degrees C), the 2223 fraction and the c-axis alignment of 2223 grains increased with increasing temperature. A significant increase of J(c) (from 1 to 41 kA cm(-2)) was observed in this range, indicating that the phase purity and the texture were the major controlling factors. In the medium temperature range (826-830 degrees C), the 2223 fraction and the grain alignment tend to saturate, and J(c) remains nearly constant at a level of 40 kA cm(-2). In the high temperature range (830-836 degrees C), the 2223 fraction and the grain alignment remained unchanged but J(c) decreased with increasing temperature. The drop in J(c) was related to the presence of an amorphous phase and a small amount of 2201 phase, indicating that the grain connectivity has become the major current-limiting factor. The variations in the filament shape, density and alignment within the multifilament tape were characterized. The influence of the inhomogeneous structure on J(c) is discussed.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Liu, Y. (Ekstern), Wang, W. (Ekstern), Poulsen, H. (Intern), Vase, P. (Ekstern)
Pages: 376-381
Publication date: 1999
Main Research Area: Technical/natural sciences

Publication information
Journal: Superconductor Science & Technology
Volume: 12
Issue number: 6
ISSN (Print): 0953-2048
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.07 SJR 0.849 SNIP 1.261
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.796 SNIP 1.343 CiteScore 2.08
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.054 SNIP 1.178 CiteScore 1.71
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.873 SNIP 1.144 CiteScore 1.78
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.243 SNIP 1.089 CiteScore 1.66
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.403 SNIP 1.352 CiteScore 2.4
ISI indexed (2011): ISI indexed yes
Plastic deformation, recrystallization and internal stresses studied by a new 3D X-ray microscope

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Juul Jensen, D. (Intern), Poulsen, H. (Intern), Lorentzen, T. (Intern)
Number of pages: 293
Publication date: 1999

Host publication Information
Title of host publication: Abstracts
Place of publication: Warrendale
Publisher: Materials Research Society
Main Research Area: Technical/natural sciences
Conference: MRS 1999 Fall meeting, Boston, MA, United States, 29/11/1999 - 29/11/1999
Source: orbit
Source-ID: 299367
Publication: Research › Conference abstract in proceedings – Annual report year: 1999

Superstructure formation and the structural phase diagram of YBa2Cu3O6+x
The structural ordering properties of oxygen in YBa2Cu3O6 + x have been studied by neutron and high-energy synchrotron X-ray diffraction and by computer simulations based on an extension of the Asymmetric Next Nearest Neighbour Interaction (ASYNNNI) model. The observed structural phases are the tetragonal disordered and five orthorhombic ordered phases that result from Cu-O chains formation along the b-axis and ordering with different periodicity na along the a-axis: ortho-I (a), ortho-II (2a), ortho-in (3a), ortho-V (5a) and ortho-VIII (8a). Only the tetragonal and the ortho-I structure have long range order. The structural phase diagram of the superstructure ordering has been
established from the experimental data, and it is concluded that the short-range superstructure ordering results from the formation of finite size domains that freeze before long range order is established. By an extension of the 2D ASYNNNI lattice gas model to include Coulomb interactions between oxygen atoms on chains that are 2a apart, we account for the observed structural phases, and confirm that the superstructures freeze into finite size domains at low temperatures. (C) 1999 Elsevier Science B.V. All rights reserved.

**General information**

State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, N. (Intern), Zimmermann, M. V. (Ekstern), Frello, T. (Intern), Käll, M. (Ekstern), Mønster, D. (Ekstern), Lindgård, P. (Ekstern), Madsen, J. (Ekstern), Niemöller, T. (Ekstern), Poulsen, H. (Intern), Schmidt, O. (Ekstern), Schneider, J. (Ekstern), Wolf, T. (Ekstern), Dosanjh, P. (Ekstern), Liang, R. (Ekstern), Hardy, W. (Ekstern)
Pages: 259-269
Publication date: 1999
Main Research Area: Technical/natural sciences

**Publication information**

Journal: Physica C: Superconductivity and its Applications
Volume: 317-318
ISSN (Print): 0921-4534
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.14 SJR 0.575 SNIP 0.924
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.446 SNIP 0.888 CiteScore 0.99
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.497 SNIP 0.83 CiteScore 0.85
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.439 SNIP 0.7 CiteScore 0.79
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.55 SNIP 0.621 CiteScore 0.79
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.652 SNIP 0.607 CiteScore 0.94
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.63 SNIP 0.631
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.412 SNIP 0.56
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.67 SNIP 0.576
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.532 SNIP 0.716
Scopus rating (2006): SJR 0.667 SNIP 0.556
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.793 SNIP 0.656
Synkrotronstudier af BiSCCO/Ag bånd

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Pages: 29
Publication date: 1999
Main Research Area: Technical/natural sciences

Publication information
Journal: Tidsskrift for Dansk Keramisk Selskab
Volume: 2
Issue number: 2
Original language: English
Source: orbit
Source-ID: 299191
Publication: Research › Journal article – Annual report year: 1999

An in situ diffraction study of a solid oxide fuel cell system
The design of a synchrotron diffraction experiment on a working SOFC air-electrode is outlined. A large number of diffraction data sets were collected successfully from LSM/YSZ/Ag cells under different polarization states at 850 degrees C. Systematic changes are observed in lattice parameters and FWHM's for the LSM phase when the cell is polarized. The peak positions for the YSZ electrode are unchanged throughout the entire experiment. This is the first experimental evidence that oxygen stoichiometry in LSM is strongly influenced by the electrochemical reactions which take place. The cell parameters increase under reducing conditions, due to a decrease in the oxygen content of the LSM. All observed changes seem to be reversible.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Sörby, L. (Ekstern), Poulsen, F. (Intern), Poulsen, H. (Intern), Garbe, S. (Ekstern), Thomas, J. (Ekstern)
Pages: 408-413
Publication date: 1998

Host publication information
Title of host publication: Proceedings of 5th European Powder Diffraction Conference
Volume: 278-281
Publisher: Transtec Publications LTD
ISBN (Print): 0-87849-807-9
Series: Materials Science Forum
ISSN: 0255-5476
A novel DC Magnetron sputtering facility for space research and synchrotron radiation optics

A new DC magnetron sputtering facility has been build up at the Danish Space Research Institute (DSRI), specially designed to enable uniform coatings of large area curved optics, such as Wolter-I mirror optics used in space telescopes and curved optics used in synchrotron radiation facilities. The paper is a brief description of this new facility and the future applications.

General information
State: Published
Organisations: National Space Institute, Astrophysics, Risø National Laboratory for Sustainable Energy
Authors: Hussain, A. (Ekstern), Christensen, F. E. (Intern), Pareschi, G. (Ekstern), Poulsen, H. (Intern)
Pages: 443-450
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: Proceedings of SPIE, the International Society for Optical Engineering
Volume: 3444
ISSN (Print): 0277-786X
Ratings:
  BFI (2018): BFI-level 1
  BFI (2017): BFI-level 1
  Scopus rating (2016): CiteScore 0.42 SNIP 0.245
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.187 SNIP 0.224 CiteScore 0.3
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.188 SNIP 0.231 CiteScore 0.3
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.2 SNIP 0.259 CiteScore 0.26
ISI indexed (2013): ISI indexed no
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.194 SNIP 0.243 CiteScore 0.27
ISI indexed (2012): ISI indexed no
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.197 SNIP 0.264 CiteScore 0.31
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.208 SNIP 0.241
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.211 SNIP 0.271
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.222 SNIP 0.289
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.227 SNIP 0.37
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.308 SNIP 0.701
A triple-crystal diffractometer for high-energy synchrotron radiation at the HASYLAB high-field wiggler beamline BW5

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Bouchard, R. (Ekstern), Hupfeld, D. (Ekstern), Lippmann, T. (Ekstern), Neuefeind, J. (Ekstern), Neumann, H. (Ekstern), Poulsen, H. (Intern), Rutt, U. (Ekstern), Schmidt, T. (Ekstern), Schneider, J. (Ekstern), Sussenbach, J. (Ekstern), Zimmermann, M. V. (Ekstern)
Pages: 90-101
Publication date: 1998
Main Research Area: Technical/natural sciences
Focusing Optics for High-Energy X-ray Diffraction

Novel focusing optical devices have been developed for synchrotron radiation in the energy range 40-100 keV. Firstly, a narrow-band-pass focusing energy-tuneable fixed-exit monochromator was constructed by combining meridionally bent Laue and Bragg crystals. Dispersion compensation was applied to retain the high momentum resolution despite the beam divergence caused by the focusing. Next, microfocusing was achieved by a bent multilayer arranged behind the crystal monochromator and alternatively by a bent Laue crystal. A 1.2 μm-high line focus was obtained at 90 keV. The properties of the different set-ups are described and potential applications are discussed. First experiments were performed, investigating with high spatial resolution the residual strain gradients in layered polycrystalline materials. The results underline that focused high-energy synchrotron radiation can provide unique information on the mesoscopic scale to the materials scientist, complementary to existing techniques based on conventional X-ray sources, neutron scattering or electron microscopy.

General information
State: Published
Organisations: Department of Management Engineering, Risø National Laboratory for Sustainable Energy, European Synchrotron Radiation Facility, Paul Scherrer Institut
Authors: Leinert, U. (Ekstern), Schulze, C. (Ekstern), Honkimäki, V. (Ekstern), Tshentscher, T. (Ekstern), Garbe, S. (Ekstern), Hignette, O. (Ekstern), Horsewell, A. (Intern), Lingham, M. (Ekstern), Poulsen, H. F. (Intern), Ziegler, E. (Ekstern)
Pages: 226-231
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Synchrotron Radiation
Volume: 5
Issue number: 3
ISSN (Print): 0909-0495
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.86 SJR 1.593 SNIP 1.578
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.161 SNIP 1.396 CiteScore 2.45
Web of Science (2015): Indexed yes
Future trends: Texture analysis for structure-sensitive properties

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Adams, B. (Ekstern), Juul Jensen, D. (Intern), Poulsen, H. (Intern), Suter, R. (Ekstern)
Pages: 29-39
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Science Forum
Volume: 273-275
ISSN (Print): 0255-5476
Ratings:
BFI (2018): BFI-level 1
In-situ synchrotron studies of the annealing behaviour of high Tc BSCCO/Ag-tapes

General information
State: Published
Investigations on the formation mechanism of the Bi(2223) phase in bulk samples and Ag-sheathed tapes

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Grivel, J. (Ekstern), Poulsen, H. (Intern), Andersen, L. (Ekstern), Frello, T. (Intern), Andersen, N. (Intern), Giannini, E. (Ekstern), Grindatto, D. (Ekstern), Flükiger, R. (Ekstern)
Pages: 50-53
Publication date: 1998
Host publication information
Title of host publication: Program and extended abstracts
Place of publication: Tokyo
Publisher: International Superconductivity Technology Center (ISTEC)
Main Research Area: Technical/natural sciences
Source-ID: 297947
Publication: Research › Article in proceedings – Annual report year: 1998

Materials science applications of high energy synchrotron radiation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Number of pages: 10
Publication date: 1998
Host publication information
Title of host publication: 6th European powder diffraction conference
Place of publication: Budapest
Publisher: Organising Committee
Main Research Area: Technical/natural sciences
Source-ID: 298435
Publication: Research › Conference abstract in proceedings – Annual report year: 1998

Microstructure analysis with hard synchrotron radiation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 1998
Host publication information
Structural phase diagram of oxygen ordering in the high-$T_c$ superconductor YBa$_2$Cu$_3$O$_{6+x}$

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Frello, T. (Intern), Andersen, N. (Intern), Käll, M. (Ekstern), Madsen, J. (Ekstern), Poulsen, H. (Intern), Schmidt, O. (Ekstern), Zimmermann, M. V. (Ekstern), Niemöller, T. (Ekstern), Schneider, J. (Ekstern), Wolf, T. (Ekstern)
Publication date: 1998

**Host publication information**
Title of host publication: Danish Physical Society annual meeting 1998. Book of abstracts
Place of publication: København
Publisher: HCØ Tryk
ISBN (Print): 87-7834-277-5
Main Research Area: Technical/natural sciences
Conference: 1998 Annual meeting of the Danish Physical Society, Nyborg, Denmark, 03/06/1998 - 03/06/1998
Source: orbit
Source-ID: 298658
Publication: Research › Conference abstract in proceedings – Annual report year: 1998

High-energy (100 keV) synchrotron X-ray diffraction has been identified as a powerful tool for characterizing texture and structural phases within Ag clad high $T_c$ superconducting tapes of the (Bi,Pb)-Sr-Ca-Cu-O (BSSCO) type during synthesis of (Bi,Pb)(2)Sr2Ca2Cu3Ox (Bi-2223) from (Bi,Pb)(2)Sr2CaCu2Ox (Bi-2212). Using a CCD camera, the texture and concentration of the dominant structural phases can be determined simultaneously within fractions of minutes. As an example, we report on the in situ annealing behavior in air at 835 degrees C of an as-rolled monofilament tape. It is shown that the alignment of the superconducting grains takes place almost exclusively in the Bi-2212 phase. During heating, the texture profile narrows rapidly above 750 degrees C, coincident with the dissolution of (Ca,Sr)(2)PbO4. A 98% conversion of Bi-2212 is obtained within 19 h, but furnace cooling leads to the formation of secondary phases such as Bi-2201 and (Ca,Sr)(2)PbO4. Room temperature data on similar tapes show that subsequent deformation and annealing results in a higher Bi-2223 phase purity while slightly deteriorating the grain alignment. (C) 1998 Elsevier Science B.V.

**Publication information**
Journal: Physica C: Superconductivity and its Applications
Volume: 298
Issue number: 3-4
ISSN (Print): 0921-4534
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.14 SJR 0.575 SNIP 0.924
Superstructure formation and structural phase diagram of $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$

General information

State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, N. (Intern), Frello, T. (Intern), Käll, M. (Ekstern), Lindgård, P. (Ekstern), Madsen, J. (Ekstern), Poulsen, H. (Intern), Zimmermann, M. V. (Ekstern), Niemöller, T. (Ekstern), Schneider, J. (Ekstern), Mønster, D. (Ekstern)

DoIs:
10.1016/S0921-4534(97)01870-4
Source: orbit
Source-ID: 298740
Publication: Research › Journal article – Annual report year: 1998
Three dimensional X-ray diffraction using high energy synchrotron radiation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Number of pages: 175
Publication date: 1998

Host publication information
Title of host publication: 6th European powder diffraction conference
Place of publication: Budapest
Publisher: Organising Committee
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 298436
Publication: Research › Conference abstract in proceedings – Annual report year: 1998

Through-thickness texture variations determined non-destructively by high energy synchrotron radiation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Pages: 271-276
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: Materials Science Forum
Volume: 273-275
ISSN (Print): 0255-5476
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.28 SJR 0.186 SNIP 0.306
BFI (2015): BFI-level 1
Scopus rating (2015): SNIP 0.337 SJR 0.217 CiteScore 0.29
BFI (2014): BFI-level 1
Scopus rating (2014): SNIP 0.448 SJR 0.269 CiteScore 0.33
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SNIP 0.342 SJR 0.235 CiteScore 0.28
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SNIP 0.467 SJR 0.279 CiteScore 0.34
Use of image-processing tools for texture analysis of high-energy X-ray synchrotron data

The introduction of synchrotron beamlines for high-energy X-ray diffraction raises new possibilities for texture determination of polycrystalline materials. The local texture can be mapped out in three dimensions and texture developments can be studied in situ in complicated environments. However, it is found that a full alignment of the two-dimensional detector used in many cases is impractical and that data-sets are often partially subject to geometric restrictions. Estimating the parameters of the traces of the Debye-Scherrer cones on the detector therefore becomes a concern. Moreover, the background may vary substantially on a local scale as a result of inhomogeneities in the sample environment etc. A set of image-processing tools has been employed to overcome these complications. An automatic procedure for estimating the parameters of the traces (taken as ellipses) is described, based on a combination of a circular Hough transform and nonlinear least-squares fitting. Using the estimated ellipses the background is subtracted and the intensity along the Debye-Scherrer cones is integrated by a combined fit of the local diffraction pattern. The corresponding algorithms are presented together with the necessary coordinate transform for pole-figure determination. The image-processing tools may be useful for the analysis of noisy or partial powder diffraction data-sets in general, provided flat two-dimensional detectors are used.

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling, Risø National Laboratory for Sustainable Energy, Risø National Laboratory
Authors: Fisker, R. (Intern), Poulsen, H. F. (Intern), Schou, J. (Intern), Carstensen, J. M. (Intern), Garbe, S. (Ekstern)
Pages: 647-653
Publication date: 1998
Main Research Area: Technical/natural sciences
Dynamics of oxygen ordering in YBa$_2$Cu$_3$O$_{6+x}$ studied by neutron and high-energy synchrotron x-ray diffraction

The dynamics of the ortho-II oxygen structure in a high purity YBa2Cu3O6+x, single crystal with x=0.50 has been studied by neutron and by X-ray diffraction with a photon energy of 100 keV. Our data show that the oxygen order develops on two different time-scales, one of the order of seconds and a much slower of the order of weeks and months. The mechanism dominating the slow time-scale is related to oxygen diffusion, while the fast mechanism may result from a temperature-dependent change in the average oxygen chain length.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Frello, T. (Intern), Andersen, N. (Intern), Madsen, J. (Ekstern), Käll, M. (Ekstern), Zimmermann, M. V. (Ekstern), Schmidt, O. (Ekstern), Poulsen, H. (Intern), Schneider, J. (Ekstern), Wolf, T. (Ekstern)
Pages: 1089-1090
Publication date: Aug 1997
Conference: 5th International Conference on Materials and Mechanisms of Superconductivity, High Temperature Superconductors, Beijing, China, 28/02/1997 - 28/02/1997
Main Research Area: Technical/natural sciences

Publication information
Journal: Physica C
Volume: 282
Issue number: part 2
ISSN (Print): 0921-4534
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.14 SJR 0.575 SNIP 0.924
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.446 SNIP 0.888 CiteScore 0.99
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.497 SNIP 0.83 CiteScore 0.85
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.439 SNIP 0.7 CiteScore 0.79
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.55 SNIP 0.621 CiteScore 0.79
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.652 SNIP 0.607 CiteScore 0.94
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.63 SNIP 0.631
An in-situ diffraction study of a solid oxide fuel cell system

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Sörby, L. (Ekstern), Poulsen, F. (Intern), Poulsen, H. (Intern), Garbe, S. (Ekstern)
Publication date: 1997
Event: Abstract from 5th European Powder Diffraction Conference, Parma, Italy.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 295955
Publication: Research - peer-review › Conference article – Annual report year: 1997

Annealing of Ag-clad BiSCCO tapes studied in-situ by high-energy synchrotron x-ray

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Frello, T. (Intern), Poulsen, H. (Intern), Andersen, N. (Intern), Abrahamsen, A. (Intern), Garbe, S. (Ekstern), Bentzon, M. (Ekstern), Zimmerman, M. V. (Ekstern)
Pages: 1363-1366
Publication date: 1997

Host publication information
Title of host publication: Applied superconductivity 1997. Vol. 2
Place of publication: London
Publisher: Institute of Physics
Editors: Rogalla, H., Blank, D.
ISBN (Print): 0-7503-0487-1
Applications of high-energy synchrotron radiation for structural studies of polycrystalline materials

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Pages: 147-154
Publication date: 1997
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Synchrotron Radiation
Volume: 4
ISSN (Print): 0909-0495
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.86 SJR 1.593 SNIP 1.578
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.161 SNIP 1.396 CiteScore 2.45
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.326 SNIP 1.505 CiteScore 2.58
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.473 SNIP 1.687 CiteScore 2.91
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.558 SNIP 1.273 CiteScore 2.36
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.503 SNIP 1.424 CiteScore 2.45
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.618 SNIP 1.479
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.496 SNIP 1.373
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.938 SNIP 1.637
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.8 SNIP 2.363
Scopus rating (2006): SJR 1.517 SNIP 1.149
Applications of high-energy synchrotron radiation within materials science

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 1997
Event: Abstract from 29th Meeting of Danish Crystallographers and 1st DANSYNC Annual Meeting, Lyngby, Denmark.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 297074
Publication: Research - peer-review › Journal article – Annual report year: 1997

A synchrotron x-ray diffraction study of the local residual strains around a single inclusion in an Al/W metal-matrix composite

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Lorentzen, T. (Intern), Feidenhans'l, R. (Ekstern), Liu, Y. (Ekstern)
Pages: 237-243
Publication date: 1997
Main Research Area: Technical/natural sciences

Publication information
Journal: Metallurgical and Materials Transactions A - Physical Metallurgy and Materials Science
Volume: 28
ISSN (Print): 1073-5623
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 1.91 SJR 1.179 SNIP 1.179
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.231 SNIP 1.332 CiteScore 1.78
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.671 SNIP 1.877 CiteScore 2.06
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Bi-2223 tapes for power applications

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Vase, P. (Ekstern), Skov-Hansen, P. (Ekstern), Han, Z. (Ekstern), Poulsen, H. (Intern), Frello, T. (Intern)
Publication date: 1997
Event: Abstract from EUCAS-97, Twente (NL), 30 Jun - 3 Jul, .
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 296902
Publication: Research - peer-review › Journal article – Annual report year: 1997

Draft of instrument

General information
Dynamics of oxygen ordering in YBa$_2$Cu$_3$O$_{6+x}$ studied by neutron and high-energy synchrotron x-ray diffraction

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Frello, T. (Intern), Andersen, N. (Intern), Madsen, J. (Ekstern), Käll, M. (Ekstern), Zimmermann, M. V. (Ekstern), Schmidt, O. (Ekstern), Poulsen, H. (Intern), Schneider, J. (Ekstern), Wolf, T. (Ekstern)
Publication date: 1997
Event: Abstract from HERCULES course, ESRF, Grenoble (FR), Mar, .
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 296118
Publication: Research › Conference abstract for conference – Annual report year: 1997

Focusing optics for high energy x-ray diffraction

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lienert, U. (Ekstern), Schulze, C. (Ekstern), Honkimäki, V. (Ekstern), Tschentscher, T. (Ekstern), Garbe, S. (Ekstern), Hignette, O. (Ekstern), Horsewell, A. (Intern), Lingham, M. (Ekstern), Poulsen, H. (Intern), Thomsen, N. (Ekstern), Ziegler, E. (Ekstern)
Publication date: 1997
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 295894
Publication: Research › Conference abstract for conference – Annual report year: 1997

High energy x-ray scattering for materials science

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 1997
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 297031
Publication: Research › Conference abstract for conference – Annual report year: 1997

In-situ studies of air electrodes in solid oxide fuel cells at 850 deg.C using synchrotron diffraction
Local strain contours around inclusions in wire-drawn Cu/W composites

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Lorentzen, T. (Intern), Clarke, A. (Ekstern), Poulsen, H. (Intern), Garbe, S. (Ekstern)
Pages: 667-674
Publication date: 1997
Main Research Area: Technical/natural sciences
Publication information
Journal: Composites Part A: Applied Science and Manufacturing
Volume: 28
ISSN (Print): 1359-835X
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.82 SJR 1.402 SNIP 2.053
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.53 SNIP 2.18 CiteScore 4.09
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.67 SNIP 2.538 CiteScore 4.08
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.59 SNIP 2.828 CiteScore 3.92
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.559 SNIP 2.706 CiteScore 3.36
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.443 SNIP 2.499 CiteScore 3.23
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.553 SNIP 2.241
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.536 SNIP 1.976
Strain profiling in thin films by synchrotron radiation - a novel technique

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Thomsen, N. (Ekstern), Lienert, U. (Ekstern), Garbe, S. (Ekstern), Honkimäki, V. (Ekstern), Poulsen, H. (Intern), Horsewell, A. (Intern)
Publication date: 1997
Event: Abstract from International Conference on Advanced Materials, Strasbourg, France.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 296595
Publication: Research - peer-review › Journal article – Annual report year: 1997

The prospect of a 3D high energy probe for materials science

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Number of pages: 1
Publication date: 1997

Host publication information
Title of host publication: Local characterisation of materials by synchrotron radiation
Place of publication: Grenoble
Publisher: ESRF
Editors: Kvick, Å., Poulsen, H.
Main Research Area: Technical/natural sciences
Conference: Experiments Division at the European Synchrotron Radiation Facility meeting, Grenoble, France, 12/02/1997 - 12/02/1997
Source: orbit
Source-ID: 297110
Publication: Research › Conference abstract in proceedings – Annual report year: 1997

Three dimensional mapping of materials science properties using high energy synchrotron radiation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Number of pages: 58
Alignment of high-$T_c$ superconducting crystallites in silver cladding studied by high-energy synchrotron x-ray diffraction

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Frello, T. (Intern), Poulsen, H. (Intern), Andersen, N. (Intern), Bentzon, M. (Ekstern), Süssebach, J. (Ekstern), Nowikow, D. (Ekstern)
Publication date: 1996
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 295391
Publication: Research › Conference abstract for conference – Annual report year: 1996

Dynamics of oxygen ordering in YBa$_2$Cu$_3$O$_{6+x}$ studied by neutron and high-energy synchrotron x-ray diffraction

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Frello, T. (Intern), Andersen, N. (Intern), Madsen, J. (Ekstern), Käll, M. (Ekstern), Zimmermann, M. V. (Ekstern), Schmidt, O. (Ekstern), Poulsen, H. (Intern), Schneider, J. (Ekstern), Wolf, T. (Ekstern)
High energy synchrotron radiation: a new tool for texture and strain determinations

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Number of pages: 81
Publication date: 1996

Host publication information
Title of host publication: 45th annual Denver x-ray conference and powder diffraction satellite meeting of the 17. congress of the International Union of Crystallography. Abstracts
Place of publication: Denver, CO
Publisher: University of Denver. Engineering Department
Main Research Area: Technical/natural sciences
Conference: 45th Annual Denver X-ray Conference, Denver, CO, United States, 03/08/1996 - 03/08/1996
Source: orbit
Source-ID: 294564
Publication: Research › Conference abstract in proceedings – Annual report year: 1996

Højenergi røntgenstråling, et vigtigt værktøj i materialeforskningen

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Pages: 6-7
Publication date: 1996

Publication information
Journal: RisøNyt
Issue number: 2
Original language: Danish
Source: orbit
Source-ID: 295508
Publication: Communication › Journal article – Annual report year: 1996
In-situ synchrotron x-ray diffraction on BiSCCO-tapes during annealing

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Bentzon, M. (Ekstern), Poulsen, H. (Intern), Garbe, S. (Ekstern), Frello, T. (Intern), Andersen, N. (Intern), Abrahamsen, A. (Intern), Zimmermann, M. V. (Ekstern)
Publication date: 1996
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 295280
Publication: Research › Conference abstract for conference – Annual report year: 1996

Investigation of local texture by high energy synchrotron radiation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Publication date: 1996
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 294575
Publication: Research › Conference abstract for conference – Annual report year: 1996

Local structure determination in polycrystalline materials using high energy synchrotron radiation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Number of pages: 22
Publication date: 1996

Host publication information
Title of host publication: Synchrotron radiation satellite meeting. Advanced photon source. Program
Place of publication: Argonne, IL
Publisher: Argonne National Laboratory
Main Research Area: Technical/natural sciences
Conference: Synchrotron radiation satellite meeting, Argonne, IL (US), 4-7 Aug, 01/01/1996
Source: orbit
Source-ID: 294563
Publication: Research › Conference abstract in proceedings – Annual report year: 1996

Local texture analysis using high energy synchrotron radiation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Garbe, S. (Ekstern), Poulsen, H. (Intern), Juul Jensen, D. (Intern)
Pages: 100-105
Publication date: 1996

Host publication information
Title of host publication: Texture of materials. Proceedings of the eleventh international conference on textures of materials. Vol. 1
Place of publication: Beijing
Structural phase transitions in bulk YBa$_2$Cu$_3$O$_{6+x}$ with $x=0.35$ and $x=0.36$

The structural behavior of mm(3)-sized single crystals of YBa2Cu3O6+x with oxygen concentrations close to the metal-insulator transition is studied as a function of temperature, using 95-keV synchrotron x-ray diffraction. At $x=0.36$, no evidence is found of a room-temperature phase separation into tetragonal and orthorhombic phases, nor of a phase boundary between Ortho-II and tetragonal. Instead, we observe two distinct phase transitions: tetragonal to Ortho-I with a critical temperature $T$-O$I=246(2)$ degrees C and Ortho-I to Ortho-II with $T$-OII $85(10)$ degrees C. Measurements of the spontaneous strain show the O/T transition to be nearly continuous with a critical exponent $\beta=0.34(2)$, consistent with a 3D Ising model driven weakly first order, presumably by the strain. A memory effect is observed, where relics of the twin domains-possibly related to tweed formations-continue to exist in the tetragonal phase when the temperature is increased above $T$-O$I$. Corresponding measurements for $x=0.35$ gave similar results with $T$-O$I=181(2)$ degrees C, $T$-OII $95(10)$ degrees C, and $\beta=0.35(2)$-but with the appearance of a small tetragonal component at room temperature. This component is interpreted as a nonequilibrium feature. In both cases the Ortho-I to Ortho-II transformations are very broad with a characteristic temperature dependence of the widths of the superstructure peaks that are similar to results obtained in a previous study for $x=0.50$. By comparison of the Ortho-II correlation lengths along $a$, $b$, and $c$ with the corresponding data for $x=0.50$ we find evidence for a strong $x$ dependency of ASYNNNI-type effective interaction parameters. The present results cannot be explained in terms of prevalent lattice gas models of the oxygen ordering and emphasizes the need for a theoretical basis that incorporates the strain and charge degrees of freedom.
Amorphous silica studied by high energy x-ray diffraction
The use of hard X-rays (60-300 keV) for diffraction studies of disordered materials has several advantages: higher resolution in direct space, smaller correction terms, removal of truncation effects, the possibility for operating in extreme environments and for direct comparison between X-ray and neutron data. A feasibility study of amorphous silica has been performed at 95 keV, using a wiggler synchrotron beam-line at HASYLAB and a cylindrical sample, 3 mm in diameter. The range of Q between 0.8 and 32 Angstrom(-1) was covered. A thorough discussion of the experimental challenges is given. The resulting systematic error intrinsic to the scattering process (not including errors in the form-factors) is found to be of the order of 0.2%. The data have been analyzed in terms of a model of the short-range order. The O-Si-O bond angle
distribution is found to be nearly Gaussian, centered around 109.3(3) degrees with a rms value of 4.2(3) degrees. For the Si-O-Si bond angle, several types of distribution $V(\alpha) = V^{-1}(\alpha) \sin(\alpha)$ were investigated. Best fits were obtained for rather broad distributions with $V$ having its maximum at 147 degrees and $V^{-1}$ at 180 degrees.

**General information**

State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Neuefeind, J. (Ekstern), Neumann, H. (Ekstern), Schneider, J. (Ekstern), Zeidler, M. (Ekstern)
Pages: 63-74
Publication date: Jul 1995
Main Research Area: Technical/natural sciences

**Publication information**

Journal: Journal of Non-Crystalline Solids
Volume: 188
Issue number: 1-2
ISSN (Print): 0022-3093
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.692 SNIP 1.163 CiteScore 2.02
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.684 SNIP 1.083 CiteScore 1.85
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.803 SNIP 1.194 CiteScore 1.87
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.822 SNIP 1.19 CiteScore 1.79
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.758 SNIP 1.124 CiteScore 1.64
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.836 SNIP 1.272 CiteScore 1.7
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.911 SNIP 1.128
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.924 SNIP 0.993
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.957 SNIP 1.2
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.95 SNIP 1.082
Scopus rating (2006): SJR 0.887 SNIP 1.158
Scopus rating (2005): SJR 0.986 SNIP 1.149
Scopus rating (2004): SJR 0.992 SNIP 1.216
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.362 SNIP 1.308
Scopus rating (2002): SJR 0.861 SNIP 1.051
Scopus rating (2001): SJR 1.099 SNIP 1.09
Amorphous silica studied by high energy x-ray diffraction

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Neuefeind, J. (Ekstern), Neumann, H. (Ekstern), Schneider, J. (Ekstern), Zeidler, M. (Ekstern)
Pages: 162-165
Publication date: 1995
Main Research Area: Technical/natural sciences

Publication information
Journal: Nuclear Instruments & Methods in Physics Research. Section B: Beam Interactions with Materials and Atoms
Volume: 97
ISSN (Print): 0168-583X
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.22 SJR 0.691 SNIP 0.906
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.74 SNIP 1.065 CiteScore 1.32
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.616 SNIP 0.905 CiteScore 1.14
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.681 SNIP 1.205 CiteScore 1.47
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.663 SNIP 0.989 CiteScore 1.18
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.685 SNIP 1.071 CiteScore 1.24
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.846 SNIP 0.971
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.672 SNIP 0.925
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.646 SNIP 0.851
Web of Science (2008): Indexed yes
Applications of high energy synchrotron radiation within metallurgy

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 1995
Event: Abstract from International workshop on scattering experiments with high energy synchrotron radiation, Schwerin (DE), 29 Oct - 1 Nov.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 293163
Publication: Research › Conference abstract for conference – Annual report year: 1995

Current induced phase change in strontium doped lanthanum manganite: A synchrotron study of a perovskite solid oxide fuel cell electrode at 1000 deg. C

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, F. (Intern), Poulsen, H. (Intern), Garbe, S. (Ekstern), Sörby, L. (Ekstern)
Publication date: 1995
Event: Abstract from Workshop on defect and transport properties in perovskites, Geilo (NO), 12-15 Nov.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 293014
Publication: Research › Conference abstract for conference – Annual report year: 1995

Diffraction on disordered materials using 'neutron-like' photons
In the past photon diffraction has been carried out mainly using the characteristic radiation from X-ray tubes in the energy range from about 8-20 keV. Comparison of these experiments with neutron diffraction results is difficult since in this energy range the photoelectric absorption is the predominant process. The photoelectric absorption decreases with lambda(3), so increasing the energy to about 100 keV has a drastic effect on the absorption coefficient. Photons in the high energy range can be obtained conveniently from modern synchrotron sources. High energy photon diffraction has additional further advantages, e.g. the larger accessible Q-range, the diminishing correction terms and the small scattering angles. We report here on a feasibility study on glassy SiO2 and liquid N-Methylformamide (NMF).

General information
State: Published
Investigation of structural phase transitions in perovskites using high energy synchrotron radiation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Neumann, H. (Ekstern), Poulsen, H. (Intern), Rütt, U. (Ekstern), Schneider, J. (Ekstern), Zimmermann, M. V. (Ekstern)
Pages: 17-35
Publication date: 1995
Main Research Area: Technical/natural sciences

Publication information
Journal: Phase Transitions
Volume: 55
Original language: English
Source: orbit
Source-ID: 293122
Publication: Research › Journal article – Annual report year: 1995

Multiple scattering in synchrotron studies of disorder materials

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Neuefeind, J. (Ekstern)
Pages: 509-514
Publication date: 1995
Main Research Area: Technical/natural sciences

Publication information
Journal: Nuclear Instruments & Methods in Physics Research. Section B: Beam Interactions with Materials and Atoms
Volume: 95
ISSN (Print): 0168-583X
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.22 SJR 0.691 SNIP 0.906
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.74 SNIP 1.065 CiteScore 1.32
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.616 SNIP 0.905 CiteScore 1.14
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.681 SNIP 1.205 CiteScore 1.47
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.663 SNIP 0.989 CiteScore 1.18
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.685 SNIP 1.071 CiteScore 1.24
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.846 SNIP 0.971
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.672 SNIP 0.925
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.646 SNIP 0.851
Web of Science (2008): Indexed yes
Observation of Ortho-III correlations by neutron and hard x-ray scattering in an untwinned YBa$_2$Cu$_3$O$_{6.77}$ single crystal

We present measurements of Ortho-III phase correlations in an untwinned single crystal of YBa$_2$Cu$_3$O$_{6.77}$ by neutron scattering and the novel method of hard (95 keV) X-ray scattering. The Ortho-III ordering is essentially two-dimensional, exhibiting Lorentzian peak shapes in the a-b plane. At room temperature, the correlation lengths deduced from the Lorentzian peak widths are about 5 unit cells (congruent-to 20 angstrom) along h and 19 unit cells (congruent-to 74 angstrom) along k, and are comparable to some correlation lengths measured for the Ortho-II phase. Upon heating, the superstructure intensity was found to decrease rapidly at temperatures above 50-degrees-C with about 10% of the original intensity remaining at 100-degrees-C and completely vanishing above 150-degrees-C. Such a low transition temperature explains why this phase is more difficult to observe than other superstructures, such as the Ortho-II.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Schleger, P. (Ekstern), Casalta, H. (Ekstern), Hadfield, R. (Ekstern), Poulsen, H. (Intern), Zimmermann, M. V. (Ekstern), Andersen, N. (Intern), Schneider, J. (Ekstern), Liang, R. (Ekstern), Dosanjh, P. (Ekstern), Hardy, W. (Ekstern)
Pages: 103-110
Publication date: 1995
Main Research Area: Technical/natural sciences

Publication information
Journal: Physica C: Superconductivity and its Applications
Volume: 241
Issue number: 1-2
ISSN (Print): 0921-4534
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.14 SJR 0.575 SNIP 0.924
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.446 SNIP 0.888 CiteScore 0.99
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.497 SNIP 0.83 CiteScore 0.85
Web of Science (2014): Indexed yes
Random-field structural transition in $\text{YBa}_2\text{Cu}_3\text{O}_{6.5}$

**General information**

State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Schleger, P. (Ekstern), Hadfield, R. (Ekstern), Casalta, H. (Ekstern), Andersen, N. (Intern), Poulsen, H. (Intern), Zimmermann, M. V. (Ekstern), Schneider, J. (Ekstern), Liang, R. (Ekstern), Dosanjh, P. (Ekstern), Hardy, W. (Ekstern)
Pages: 1446-1449
Publication date: 1995
Main Research Area: Technical/natural sciences

**Publication information**

Journal: Physical Review Letters
**Structural phase diagram of YBa$_2$Cu$_3$O$_{6+x}$**

*General information*
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern)
Publication date: 1995
Event: Abstract from HASYLAB annual users meeting, Hamburg (DE), 1 Feb, .
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 293197
Publication: Research › Conference abstract for conference – Annual report year: 1995

**Synchrotron radiation diffraction: A novel tool for recrystallization studies in bulk μm$^3$ sized local areas**

*General information*
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Juul Jensen, D. (Intern)
Pages: 503-508
Publication date: 1995

*Host publication information*
Title of host publication: Microstructural and crystallographic aspects of recrystallization. Proceedings
Place of publication: Roskilde
Publisher: Risø National Laboratory
Editors: Hansen, N., Juul Jensen, D., Liu, Y., Ralph, B.
ISBN (Print): 87-550-2088-7
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 293756
Publication: Research › Article in proceedings – Annual report year: 1995

**The local perfection of massive gradient crystals studied by high-energy x-ray diffraction**

*General information*
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Magerl, A. (Ekstern), Liss, K. (Ekstern), Hastings, J. (Ekstern), Siddons, D. (Ekstern), Neumann, H. (Ekstern), Poulsen, H. (Intern), Rutt, U. (Ekstern), Schneider, J. (Ekstern), Madar, R. (Ekstern)
Pages: 329-334
Publication date: 1995
Main Research Area: Technical/natural sciences

*Publication information*
Journal: Europhysics Letters
Volume: 31
ISSN (Print): 0295-5075
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
The resolution function of a triple-crystal diffractometer for high-energy synchrotron radiation. II. Dispersive Laue geometry

General information
State: Published
Experimental investigations of oxygen ordering and atomic displacements in the Ortho-II phase of $\text{YBa}_2\text{Cu}_3\text{O}_{6.5}$ by neutron and synchrotron x-ray diffraction

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Schleger, P. (Ekstern), Hadfield, R. (Ekstern), Casalta, H. (Ekstern), Poulsen, H. (Intern), Zimmermann, M. V. (Ekstern), Andersen, N. (Intern), Schneider, J. (Ekstern), Liang, R. (Ekstern), Dosanjh, P. (Ekstern), Hardy, W. (Ekstern)
Number of pages: 99
Publication date: 1994

Host publication information
Title of host publication: Fourth Nordic symposium on superconductivity. 4th NSSC. Abstracts
Volume: GIPR-323
Place of publication: Göteborg
Publisher: Chalmers University of Technology. Göteborg University
Main Research Area: Technical/natural sciences
Conference: 4th Nordic Symposium on Superconductivity, Varberg, Sweden, 25/05/1994 - 25/05/1994
Source: orbit
Source-ID: 292346
Publication: Research › Conference abstract in proceedings – Annual report year: 1994

High energy synchrotron radiation. A new probe for condensed matter research

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Schneider, J. (Ekstern), Bouchard, R. (Ekstern), Brückel, T. (Ekstern), Lippert, M. (Ekstern), Neumann, H. (Ekstern), Poulsen, H. (Intern), Rutt, U. (Ekstern), Schmidt, T. (Ekstern), Zimmermann, M. V. (Ekstern)
Pages: 415-421
Publication date: 1994
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal de Physique IV
Volume: 4
Issue number: C9
ISSN (Print): 1155-4339
Ratings:
BFI (2008): BFI-level 1
Web of Science (2005): Indexed yes
Web of Science (2004): Indexed yes
Web of Science (2003): Indexed yes
Web of Science (2002): Indexed yes
Web of Science (2000): Indexed yes
Original language: English
Source: orbit
Source-ID: 292823
Publication: Research - peer-review › Journal article – Annual report year: 1995
Simultaneous neutron and x-ray refinement of Ortho-II superstructure in YBa$_2$Cu$_3$O$_{6.5}$

Clearly defined Lorentzian-like profiles of the Ortho-II superstructure diffraction peaks have been observed with neutrons for the first time. The superstructure has been refined by simultaneously fitting neutron and x-ray measurements on the same crystal. The combination of both x-ray and neutron information is important since the formation of the Ortho-II phase is driven by oxygen ordering which can be most clearly seen by the neutrons whilst the x-rays are more sensitive to the heavy ion displacements.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Hadfield, R. (Ekstern), Schleger, P. (Ekstern), Casalta, H. (Ekstern), Andersen, N. (Intern), Poulsen, H. (Intern), Zimmerman, M. V. (Ekstern), Schneider, J. (Ekstern), Hutchings, M. (Ekstern), Keen, D. (Ekstern), Ruixing Liang (Ekstern), Dosanjh, P. (Ekstern), Hardy, W. (Ekstern)
Pages: 1267-1268
Publication date: 1994
Main Research Area: Technical/natural sciences

Publication information
Journal: Physica C: Superconductivity and its Applications
Volume: 235-240
ISSN (Print): 0921-4534
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.14 SJR 0.575 SNIP 0.924
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.446 SNIP 0.888 CiteScore 0.99
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.497 SNIP 0.83 CiteScore 0.85
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.439 SNIP 0.7 CiteScore 0.79
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.55 SNIP 0.621 CiteScore 0.79
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.652 SNIP 0.607 CiteScore 0.94
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.63 SNIP 0.631
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.412 SNIP 0.56
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.67 SNIP 0.576
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.532 SNIP 0.716
Scopus rating (2006): SJR 0.667 SNIP 0.556
Studies of oxygen ordering in oxygen deficient and metal ion doped YBa$_2$Cu$_{3-y}$M$_y$O$_{6+x}$ (M = Al, Fe, Co) high T$_c$ superconductors

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, N. (Intern), Fiig, T. (Ekstern), Lindgård, P. (Ekstern), Andersen, J. (Ekstern), Bohr, H. (Ekstern), Mannstaedt, S. (Ekstern), Mouritsen, O. (Ekstern), Poulsen, H. (Intern)
Number of pages: 122
Publication date: 1994

Host publication information
Title of host publication: Fifteenth European crystallographic meeting (ECM-15). Book of abstracts
Place of publication: München
Publisher: R. Oldenbourg Verlag
Series: Zeitschrift für Kristallographie. Supplement Issue 8
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 292339
Publication: Research - peer-review » Book chapter – Annual report year: 1994

The line shape of the Ortho-II superstructure reflection in YBa$_2$Cu$_{3.06}$O$_{6.5}$
Neutron and synchrotron x-ray measurements of the Ortho-II superstructure reflections on a high quality single crystal of YBa2Cu3O6.5 revealed that the intrinsic line shape is a Lorentzian to the power 5/2. It is argued that such a line shape implies late-stage domain coarsening of a quenched system ordering in three dimensions (d=3) with a two component order parameter (n=2).

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Schleger, P. (Ekstern), Hadfield, R. (Ekstern), Casalta, H. (Ekstern), Andersen, N. (Intern), Poulsen, H. (Intern), Zimmermann, M. V. (Ekstern), Schneider, J. (Ekstern), Liang, R. (Ekstern), Dosanjh, P. (Ekstern), Hardy, W. (Ekstern)
Pages: 1269-1270
Publication date: 1994
Main Research Area: Technical/natural sciences
Publication information
Effects of Co, Fe, and Al doping on the oxygen disordering and superconducting transition temperature of YBa$_2$Cu$_3$O$_{6+x}$

Using computer simulation on a model of oxygen ordering in the basal Cu$_{1-y}$M$_y$O$_x$ plane of the high-temperature superconductor YBa$_2$Cu$_3$-yM$_y$O$_{6+x}$, we show that the effect of substituting Cu with M = Co, Fe, or Al is a diminishing of the oxygen-ordered orthorhombic domain sizes and eventually a breakdown of the orthorhombic structure. The model accounts for experimental structural data. By use of a previously established minimal model, which connects the superconducting transition temperature, $T_c$, to the formation of specific ordered orthorhombic domains in the undoped material, we show that the detrimental effect on $T_c$ by metal-ion doping as well as oxygen depletion becomes manifest in a unified way as a result of oxygen disordering.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Vitting Andersen, J. (Ekstern), Andersen, N. (Intern), Mouritsen, O. (Ekstern), Poulsen, H. (Intern)
Pages: 143-152
Publication date: 1993
Main Research Area: Technical/natural sciences

Publication information
Journal: Physica C: Superconductivity and its Applications
Volume: 214
Issue number: 1-2
ISSN (Print): 0921-4534
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.14 SJR 0.575 SNIP 0.924
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.446 SNIP 0.888 CiteScore 0.99
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.497 SNIP 0.83 CiteScore 0.85
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.439 SNIP 0.7 CiteScore 0.79
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.55 SNIP 0.621 CiteScore 0.79
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.652 SNIP 0.607 CiteScore 0.94
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.63 SNIP 0.631
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.412 SNIP 0.56
BFI (2008): BFI-level 1
Oxygen-ordering phenomena in $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ studied by Monte Carlo simulation: PHASE-DIAGRAM, STRUCTURE FACTOR AND OXYGEN EQUILIBRIUM PRESSURE

The oxygen order in $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ has been investigated by Monte Carlo simulation with the two-dimensional anisotropic next-nearest-neighbor lattice gas model, the ASYNNNI model. For a specific set of interaction parameters we have calculated the structural phase diagram, the chemical potential, and the structure factor as a function of temperature and wave vector for $x = 0.4$. The phase diagram has been determined from an investigation of the order parameters and their fluctuations as well as by the use of an improved version of the Ferrenberg-Swendsen method. The calculated phase diagram and the widths of the structure factors are in excellent agreement with measured neutron-diffraction data. We suggest that the observation of an orthorhombic distortion, simultaneously with only short-range oxygen order at $T = 25$-degrees-C, is due to the freezing-in of an ortho-II domain state with a preferred oxygen chain direction and accordingly only two types of domains. Using thermodynamic relations the chemical potential has been related to the measured oxygen-gas pressure, and it is discussed why only qualitative agreement with experimental data is established.
Structure and superconductivity in Co doped YBa$_2$Cu$_3$O$_{6+x}$

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, N. (Intern), Andersen, J. (Ekstern), Börjesson, L. (Ekstern), Hadfield, R. (Ekstern), Kakihana, M. (Ekstern), McGreevy, R. (Ekstern), Mouritsen, O. (Ekstern), Poulsen, H. (Intern)

Original language: English
DOIs:
10.1016/0921-4534(93)90792-O
Source: orbit
Source-ID: 290855
Publication: Research › Journal article – Annual report year: 1993
Oxygen order and superconductivity in pure and doped \( \text{YBa}_2\text{Cu}_3\text{O}_{6+x} \)

**General information**

State: Published

Organisations: Risø National Laboratory for Sustainable Energy

Authors: Poulsen, H. (Intern), Andersen, N. (Intern), Lebech, B. (Intern), Andersen, J. (Ekstern), Bohr, H. (Ekstern), Mouritsen, O. (Ekstern), Zeiske, T. (Ekstern), Sonntag, R. (Ekstern), Hohlwein, D. (Ekstern), Wolf, T. (Ekstern)

Number of pages: 215

Publication date: 1992

Host publication information

Title of host publication: Proceedings of the Joint Nordic Spring meeting '92. Extended abstracts

Volume: Risø-R-628(EN)

Editor: Lindgård, P.

ISBN (Print): 87-550-1810-6

Main Research Area: Technical/natural sciences

Conference: 3rd Nordic Conference on Surface Science; 6th Nordic Symposium on Computer Simulation; 3rd Nordic Symposium on Superconductivity, Nyborg Strand, Denmark, 07/05/1992 - 07/05/1992

Links:

http://www.risoe.dtu.dk/rispubl/reports_INIS/RISOR628.pdf

Source: orbit

Source-ID: 290336

Publication: Research › Conference abstract in proceedings – Annual report year: 1992

Solving the 3-D ASYNNNI model on the connection machine

**General information**

State: Published

Organisations: Risø National Laboratory for Sustainable Energy

Authors: Fiig, T. (Ekstern), Poulsen, H. (Intern), Andersen, N. (Intern), Lindgård, P. (Intern), Mouritsen, O. (Ekstern)

Number of pages: 141

Publication date: 1992

Host publication information

Title of host publication: Proceedings of the Joint Nordic Spring meeting '92. Extended abstracts

Volume: Risø-R-628(EN)

Editor: Lindgård, P.

ISBN (Print): 87-550-1810-6

Main Research Area: Technical/natural sciences

Conference: 3rd Nordic Conference on Surface Science; 6th Nordic Symposium on Computer Simulation; 3rd Nordic Symposium on Superconductivity, Nyborg Strand, Denmark, 07/05/1992 - 07/05/1992

Links:

http://www.risoe.dtu.dk/rispubl/reports_INIS/RISOR628.pdf

Source: orbit

Source-ID: 290349

Publication: Research › Conference abstract in proceedings – Annual report year: 1992

Structure and superconductivity in Co, Fe, and Al doped \( \text{YBa}_2\text{Cu}_3\text{O}_{6+x} \)

**General information**

State: Published

Organisations: Risø National Laboratory for Sustainable Energy

Authors: Andersen, N. (Intern), Andersen, J. (Ekstern), Börjesson, L. (Ekstern), Hadfield, R. (Ekstern), Kakihana, M. (Ekstern), McGreevy, R. (Ekstern), Mouritsen, O. (Ekstern), Poulsen, H. (Intern)

Publication date: 1992

Event: Abstract from E-MRS 1992 fall meeting, Strasbourg (FR), 3-6 Nov.
The role of disorder and defect structures in high temperature superconductivity

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, N. (Intern), Andersen, J. (Ekstern), Börjesson, L. (Ekstern), Hadfield, R. (Ekstern), Kakihana, M. (Ekstern), McGreevy, R. (Ekstern), Mouritsen, O. (Ekstern), Poulsen, H. (Intern)
Publication date: 1992
Event: Abstract from Two day contractors workshop on EC activities in high temperature superconductivity, Strasbourg (FR), 2-3 Nov.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 289979
Publication: Research › Conference abstract for conference – Annual report year: 1992

Ageing and structural stability of oxygen in the YBaCuO superconductor via a diffusion model

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, J. V. (Ekstern), Bohr, H. (Ekstern), Poulsen, H. (Intern), Mouritsen, O. (Ekstern)
Pages: 980
Publication date: 1991
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 289977
Publication: Research › Conference abstract for conference – Annual report year: 1992

Antiferromagnetism and metallic conductivity in Nb$_{12}$O$_{29}$

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Cava, R. (Ekstern), Batlogg, B. (Ekstern), Krajewski, J. (Ekstern), Gammel, P. (Ekstern), Poulsen, H. (Intern), Peck Jr., W. (Ekstern), Rupp Jr., L. (Ekstern)
Pages: 598-600
Publication date: 1991
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 289424
Publication: Research › Journal article – Annual report year: 1991

Volume: 36
Issue number: 3
ISSN (Print): 0003-0503
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Original language: English
Source: orbit
Source-ID: 289424
Publication: Research - peer-review › Journal article – Annual report year: 1991

Journal: Nature
Volume: 350
ISSN (Print): 0028-0836
Ratings:
BFI (2018): BFI-level 3
Web of Science (2018): Indexed yes
Computer simulation of phase separation and ordering processes in low-dimensional systems

An account is given of recent activity in the field of dynamics of phase separation and ordering processes in two-dimensional statistical mechanical models. The fundamental questions of the dynamics involve the form of the growth law, the value of the growth exponent, the dynamical scaling properties, and a possible universal classification of the late-stage dynamics. Evidence from kinetic lattice model calculations using computer-simulation techniques is presented in favor of a universal description of the dynamics in terms of algebraic growth laws with exponents which only depend on the nature of the conservation laws in effect. Atomic and molecular overlayers on solid surfaces and weakly-coupled atomic layers of certain three-dimensional crystals constitute a particularly suitable class of systems for studying fundamental aspects of ordering dynamics and phase separation in two dimensions since these systems provide a richness of ordering symmetries and degeneracies as well as they obey different conservation laws. Specific systems dealt with include the chemisorption systems O/W(110) and O/W(112), and oxygen layers in the basal CuO-planes of high-T(c) superconductors of the YBa2Cu3O7-delta-type.
Dynamical scaling of oxygen ordering in YBa$_2$Cu$_3$O$_{7-\delta}$

Computer simulation on a two-dimensional anisotropic lattice-gas model of oxygen ordering in high-Tc superconductors of the YBa$_2$Cu$_3$O$_{7-\delta}$-type shows that the ordering dynamics obey algebraic growth laws which are different in the ortho-I and ortho-II phases. It is possible to relate this dynamical scaling behavior to a similar scaling in the experimentally observed temporal variation of the superconductivity transition temperature, hence suggesting a specific coupling between the coherence of oxygen order in the basal Cu-O planes and the superconducting state.
Electrical and magnetic properties of Nb\textsubscript{2}\textit{O}\textsubscript{5-\textgamma} crystallographic shear structures

The reduced niobium oxides Nb\textsubscript{25}O\textsubscript{62}, Nb\textsubscript{47}O\textsubscript{116}, Nb\textsubscript{22}O\textsubscript{54}, and Nb\textsubscript{12}O\textsubscript{29} have been prepared in pure polycrystalline form by a niobium-metal gettering technique. They are related to the high niobia parent structure through the action of crystallographic shear to accommodate oxygen deficiency in Nb\textsubscript{2}O\textsubscript{5-\textdelta}. Electrical conductivities increase with increasing reduction: Nb\textsubscript{12}O\textsubscript{29} is a metallic conductor down to 0.3 K. All show, surprisingly, Curie-Weiss behavior in the chi-vs-T curves, with Nb\textsubscript{12}O\textsubscript{29} ordering antiferromagnetically at 12 K.
International interesse for superleder-teori

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, N. (Intern), Poulsen, H. (Intern)
Pages: 10-11
Publication date: 1991
Main Research Area: Technical/natural sciences

Publication information
Lattice gas simulation of oxygen ordering in $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ showing dynamical scaling

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Andersen, N. (Intern), Andersen, J. (Ekstern), Bohr, H. (Ekstern), Mouritsen, O. (Ekstern)
Pages: 827-832
Publication date: 1991
Main Research Area: Technical/natural sciences

Modelling the relationships between oxygen ordering and superconductivity transition temperature in $\text{YBa}_2\text{Cu}_3\text{O}_x$

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Andersen, N. (Intern), Vitting Andersen, J. (Ekstern), Bohr, H. (Ekstern), Mouritsen, O. (Ekstern)
Pages: 981
Publication date: 1991
Main Research Area: Technical/natural sciences

Oxygen Ordering and Superconductivity in the High $T_c$ Superconductor $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Materials Research Division, Metal Structures in Four Dimensions
Authors: Poulsen, H. F. (Intern)
Number of pages: 96
Publication date: 1991

Publication information
Publisher: Risø National Laboratory
ISBN (Print): 57-550-1787-8
Relation between superconducting transition temperature and oxygen ordering in YBa$_2$Cu$_3$O$_{6+x}$

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Andersen, N. (Intern), Vitting Andersen, J. (Ekstern), Bohr, H. (Ekstern), Mouritsen, O. (Ekstern)
Pages: 594-596
Publication date: 1991
Main Research Area: Technical/natural sciences

Publication information
Journal: Nature
Volume: 349
Issue number: 6310
ISSN (Print): 0028-0836
Ratings:
BFI (2018): BFI-level 3
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 13.33
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 14.38
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 14.22
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 14.96
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 14.01
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 13.96
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Study of the structural phase diagram, oxygen bulk in-diffusion, and equilibrium partial pressure of $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, N. (Intern), Lebech, B. (Intern), Poulsen, H. (Intern)
Pages: 449-452
Publication date: 1991

**Host publication information**
Title of host publication: Advances in superconductivity III
Place of publication: Tokyo
Publisher: Springer Verlag
Editors: Kajimura, K., Hayakawa, H.
Main Research Area: Technical/natural sciences
Conference: 3. International symposium on superconductivity. ISS ’90, Sendai, 6-9 Nov, 01/01/1990
Source: orbit
Source-ID: 289315
Publication: Research › Article in proceedings – Annual report year: 1991

Temporal variation of superconductivity transition temperature and dynamical scaling of oxygen ordering in $\text{YBa}_2\text{Cu}_3\text{O}_x$

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Andersen, N. (Intern), Vitting Andersen, J. (Ekstern), Bohr, H. (Ekstern), Mouritsen, O. (Ekstern)
Pages: 980
Publication date: 1991
Main Research Area: Technical/natural sciences

**Publication information**
Volume: 36
Issue number: 3
ISSN (Print): 0003-0503
Ratings:
- ISI indexed (2013): ISI indexed no
- ISI indexed (2012): ISI indexed no
- ISI indexed (2011): ISI indexed no
Original language: English
Source: orbit
Source-ID: 289423
Publication: Research - peer-review › Journal article – Annual report year: 1991
Twin-domain size and bulk oxygen in-diffusion kinetics of YBa$_2$Cu$_3$O$_{6+x}$ studied by neutron powder diffraction and gas volumetry

We report experimental results of twin-domain size and bulk oxygen in-diffusion kinetics of YBa$_2$Cu$_3$O$_{6+x}$, which supplement a previous and simultaneous study of the structural phase diagram and oxygen equilibrium partial pressure. Analysis of neutron powder diffraction peak broadening show features which are identified to result from temperature independent twin-domain formation in to different orthorhombic phases with domain sizes 250 and 350 angstrom, respectively. The oxygen in-diffusion flow shows simple relaxation type behaviour $J = J_0 \exp(-t/\tau)$ despite a rather broad particle size distribution. At higher temperatures, $\tau$ is activated with activation energies 0.55 and 0.25 eV in the tetragonal and orthorhombic phases, respectively. Comparison between twin-domain sizes and bulk oxygen in-diffusion time constants indicates that the twin-domain boundaries may contribute to the effective bulk oxygen in-diffusion. All our results may be interpreted in terms of the 2D ASYNNNI model description of the oxygen basal plane ordering, and they suggest that recent first principles interaction parameters should be modified.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Poulsen, H. (Intern), Andersen, N. (Intern), Lebech, B. (Intern)
Pages: 387-397
Publication date: 1991
Main Research Area: Technical/natural sciences

Publication information
Journal: Physica C: Superconductivity and its Applications
Volume: 173
Issue number: 5-6
ISSN (Print): 0921-4534
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.14 SJR 0.575 SNIP 0.924
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.446 SNIP 0.888 CiteScore 0.99
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.497 SNIP 0.83 CiteScore 0.85
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.439 SNIP 0.7 CiteScore 0.79
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.55 SNIP 0.621 CiteScore 0.79
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.652 SNIP 0.607 CiteScore 0.94
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.63 SNIP 0.631
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.412 SNIP 0.56
BFI (2008): BFI-level 1
Structural phase diagram and equilibrium oxygen partial pressure of $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$

**General information**
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, N. (Intern), Lebech, B. (Intern), Poulsen, H. (Intern)
Publication date: 1990

**Host publication information**
Title of host publication: 15. Congress of the International Union of Crystallography. Collected abstracts
Place of publication: Bordeaux
Publisher: Association Francaise de Cristallographie
Editor: Authier, A.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 288482
Publication: Research › Article in proceedings – Annual report year: 1990

An experimental technique by which in-situ gas volumetric measurements are carried out on a neutron powder diffractometer, is presented and used for simultaneous studies of oxygen equilibrium partial pressure and the structural phase diagram of $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$. Experimental data was collected under near equilibrium conditions at 350 points in $(x,T)$-space with $0.15 < x < 0.92$ and $25 \, ^\circ\text{C} < T < 725 \, ^\circ\text{C}$. Precise values of oxygen stoichiometries (absolute values of $x$ within 0.02) were obtained by use of the ideal gas law in connection with iodiometric titration and structural analyses. The temperature variations in lattice parameters were measured and used to establish the structural phase diagram. Pure tetragonal or orthorhombic phases were found. The $(x,T)$ phase boundary for transition from tetragonal to orthorhombic symmetry gives strong support for a recent parameter free 2D Ising model calculation of the ordering of oxygen. Oxygen equilibrium partial pressure shows significant variations with temperature and concentration which indicate that $x = 0.15$ and $x = 0.92$ are minimum and maximum oxygen concentrations. Measurements of oxygen in-diffusion flow show relaxation type behaviour: View the MathML source. The prefactor $j_0$ is activated with activation energies decreasing from 1.5 eV ($x = 0.25$) to 1.0 eV ($x = 0.8$). The relaxation time $\tau$ shows an anomalous behaviour that may be correlated with first order phase transitions predicted from theoretical model calculations.

**General information**
Structural phase diagram and equilibrium oxygen partial pressure of $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ (PS-08.05.21)

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, N. (Intern), Lebech, B. (Intern), Poulsen, H. (Intern)
Pages: C-321
Publication date: 1990
Main Research Area: Technical/natural sciences

Publication information
Volume: 46
Issue number: Suppl.
ISSN (Print): 0108-7673
Ratings:
Web of Science (2018): Indexed yes
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.652 SNIP 2.248 CiteScore 4.31
BFI (2015): BFI-level 1
Scopus rating (2015): SNIP 1.179 SJR 1.079 CiteScore 1.54
BFI (2014): BFI-level 1
Scopus rating (2014): SNIP 1.149 SJR 1.255
BFI (2013): BFI-level 1
Scopus rating (2013): SNIP 1.062 SJR 1.339
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SNIP 1.26 SJR 1.415
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SNIP 1.266 SJR 1.561
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SNIP 46.99 SJR 16.47
BFI (2008): BFI-level 1
Scopus rating (2008): SNIP 36.437 SJR 13.79
Scopus rating (2007): SNIP 1.294 SJR 1.333
The structural phase diagram and oxygen equilibrium partial pressure of $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ studied by neutron powder diffraction and gas volumetry

An experimental technique based on neutron powder diffraction and gas volumetry is presented and used to study the structural phase diagram of $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ under equilibrium conditions in an extended part of $(x, T)$-phase ($0.15 < x < 0.92$ and $25$-degrees-C $< T < 725$-degrees-C). Our experimental observations lend strong support to a recent two-dimensional anisotropic next-nearest-neighbour Ising model calculation (the ASYNNNI model) of the basal plane oxygen ordering based on first principle interaction parameters. Simultaneous measurements of the oxygen equilibrium partial pressure show anomalies, one of which proves the thermodynamic stability of the orthorhombic OII double cell structure. Striking similarity with predictions of recent model calculations support that another anomaly may be interpreted to result from local one-dimensional fluctuations in the distribution of oxygen atoms in the basal plane of tetragonal YBCO. Our pressure data also indicate that $x = 0.92$ is a maximum obtainable oxygen concentration for oxygen pressures below 760 Torr.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Andersen, N. (Intern), Lebech, B. (Intern), Poulsen, H. (Intern)
Pages: 31-42
Publication date: 1990
Main Research Area: Technical/natural sciences

Publication information
Journal: Physica C: Superconductivity and its Applications
Volume: 172
Issue number: 1-2
ISSN (Print): 0921-4534
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.14 SJR 0.575 SNIP 0.924
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.446 SNIP 0.888 CiteScore 0.99
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.497 SNIP 0.83 CiteScore 0.85
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.439 SNIP 0.7 CiteScore 0.79
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.55 SNIP 0.621 CiteScore 0.79
Oxidation Kinetics in Oxygen Deficient YBa$_2$Cu$_3$O$_{7-x}$ Studied by Neutron Powder Diffraction

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Authors: Als-Nielsen, J. (Ekstern), Andersen, N. (Intern), Broholm, C. (Ekstern), Clausen, K. (Ekstern), Lebech, B. (Intern), Nielsen, M. (Intern), Poulsen, H. (Intern)
Pages: 2254-2261
Publication date: 1989
Main Research Area: Technical/natural sciences

Publication information
Journal: I E E E Transactions on Magnetics
Volume: 25
ISSN (Print): 0018-9464
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
Projects:

**High Resolution X-ray Diffraction Contrast Tomography**

Department of Energy Conversion and Storage

**Period:** 15/11/2017 → 14/11/2020

**Number of participants:** 3

**Phd Student:**

Lucas, Mariana Mar (Intern)
Supervisor:
Poulsen, Henning Friis (Intern)
Main Supervisor:
Andreasen, Jens Wenzel (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Multiscale coarsening studied by Dark Field X-ray Microscopy
Department of Physics
Period: 01/11/2017 → 31/10/2020
Number of participants: 2
Phd Student:
Kutsal, Mustafacan (Intern)
Main Supervisor:
Poulsen, Henning Friis (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Multi-Scale 3D Imaging of Heterogeneous Nucleation in Ferroelectrics
Department of Physics
Period: 15/06/2017 → 14/06/2020
Number of participants: 4
Phd Student:
Ormstrup, Jeppe (Intern)
Supervisor:
Matheiesen, Ragnvald (Ekstern)
Simons, Hugh (Intern)
Main Supervisor:
Poulsen, Henning Friis (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

3D imaging center
Department of Physics
Neutrons and X-rays for Materials Physics
Department of Applied Mathematics and Computer Science
Image Analysis & Computer Graphics
Department of Energy Conversion and Storage
Imaging and Structural Analysis
Electrofunctional materials
Centre for oil and gas – DTU
Period: 01/01/2016 → 01/01/2021
Number of participants: 14
Project participant:
Dahl, Anders Bjorholm (Intern)
Oddershede, Jette (Intern)
Trinderup, Camilla Himmelstrup (Intern)
Simonsen, Søren Bredmose (Intern)
Zheng, Yi (Intern)
Brink, Bastian (Intern)
Lauridsen, Torsten (Ekstern)
Thydén, Karl Tor Sune (Intern)
Sanna, Simone (Intern)
Baier, Sina (Intern)
Bentzen, Janet Jonna (Intern)
Christensen, Anders Nymark (Intern)
Project Manager, organisational:
Gundlach, Carsten (Intern)
Project Manager, academic:
Poulsen, Henning Friis (Intern)

Related projects:

Alliance for Imaging and Modelling of Energy Applications

Publications:

Powder embossing method for selective loading of polymeric microcontainers with drug formulation
Crack Tip Flipping under Mode I Tearing: Investigated by X-Ray Tomography
In-Situ X-ray Tomography Study of Cement Exposed to CO2 Saturated Brine
Graphite nodules in fatigue-tested cast iron characterized in 2D and 3D
Scene reassembly after multimodal digitization and pipeline evaluation using photorealistic rendering
From concept to in vivo testing: Microcontainers for oral drug delivery
Synthesis and characterization of Fe–Ni/γ-Al2O3 egg-shell catalyst for H2 generation by ammonia decomposition
Microstructure and micromechanics of the heart urchin test from X-ray tomography
Surface Detection using Round Cut
Characterization of graphite nodules in thick-walled ductile cast iron
High-Performance Microchanneled Asymmetric Gd0.1Ce0.9O1.95-δ-La0.6Sr0.4FeO3-δ-Based Membranes for Oxygen Separation

Dark Field X-ray Microscopy of energy materials

Department of Energy Conversion and Storage
Period: 15/06/2015 → 14/07/2018
Number of participants: 4
Phd Student:
Sierra Trujillo, José Xavier (Intern)
Supervisor:
Jørgensen, Peter Stanley (Intern)
Poulsen, Henning Friis (Intern)
Main Supervisor:
Bowen, Jacob R. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Structural reorganization during cyclic deformation

Department of Mechanical Engineering
Period: 01/06/2015 → 31/05/2018
Number of participants: 3
Phd Student:
Diederichs, Annika Martina (Intern)
Supervisor:
Poulsen, Henning Friis (Intern)
Main Supervisor:
Pantleon, Wolfgang (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Computer Simulation of the 3D structure of Materials
Department of Physics
Period: 01/02/2015 → 31/01/2018
Number of participants: 6
Phd Student:
Zhang, Jin (Intern)
Supervisor:
Voorhees, Peter (Ekstern)
Main Supervisor:
Poulsen, Henning Friis (Intern)
Examiner:
Jacobsen, Karsten Wedel (Intern)
Moelans, Nele (Ekstern)
Rollett, Anthony David (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Coarsening of polycrystalline structures
Department of Physics
Period: 01/10/2014 → 10/02/2018
Number of participants: 2
Phd Student:
Ahl, Sonja Rosenlund (Intern)
Main Supervisor:
Poulsen, Henning Friis (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Alliance for Imaging and Modelling of Energy Applications
The CINEMA research alliance will develop unique 3D micro-structural characterization methods, which make it possible to investigate components under realistic conditions and in real time. This will enable correlation between performance and local changes in the microstructure.
Department of Energy Conversion and Storage
Imaging and Structural Analysis
Department of Physics
Neutrons and X-rays for Materials Physics
Department of Wind Energy
Composites and Materials Mechanics
Department of Applied Mathematics and Computer Science
Image Analysis & Computer Graphics
Scientific Computing
Mixed Conductors
Statistics and Data Analysis
University of Copenhagen
Northwestern University
University of Manchester
MaxLab
LM Wind Power
Haldor Topsoe AS
Xnovo Technology ApS
Rockwool International
Amminex Emissions Technology A/S
Period: 01/01/2014 → 31/12/2018
Number of participants: 26
Acronym: CINEMA
Project participant:
Mikkelsen, Lars Pilgaard (Intern)
Sørensen, Bent F. (Intern)
Bowen, Jacob R. (Intern)
Kuhn, Luise Theil (Intern)
Larsen, Rasmus (Intern)
Hansen, Per Christian (Intern)
Frandsen, Henrik Lund (Intern)
Gundlach, Carsten (Intern)
Dahl, Anders Bjorholm (Intern)
Yang, Shu-Yi (Intern)
Poulsen, Stefan Othmar (Intern)
Lyckeaard, Allan (Intern)
Lauridsen, Erik Mejdal (Intern)
Sørensen, Henning Osholm (Ekstern)
Project Manager, organisational:
Sørensen, Hanne (Intern)
PhD Student:
Jespersen, Kristine Munk (Intern)
Beil, Johannes (Ekstern)
Andersen, Michael (Intern)
Emerson, Monica Jane (Intern)
De Angelis, Salvatore (Intern)
Birkelund, Klaus (Ekstern)
Jacobsen, Hjalte Sylvester (Intern)
Chapelle, Lucie (Intern)
Supervisor:
Frandsen, Henrik Lund (Intern)
Project Manager, academic:
Andreasen, Jens Wenzel (Intern)
Project Coordinator:
Poulsen, Henning Friis (Intern)

Relations
Activities:
Multi-scale mapping of strain mechanisms in lead-free piezoceramics

Department of Physics
Period: 15/03/2013 → 22/06/2016
Number of participants: 6
Phd Student: Majkut, Marta (Intern)
Supervisor: Oddershede, Jette (Intern)
Main Supervisor: Schmidt, Søren (Intern)
Examiner: Poulsen, Henning Friis (Intern)
Clausen, Bjørn (Intern)
Grant Webber, Kyle (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

3D Neutron Diffraction (3DND) methodology

Department of Physics
Period: 15/02/2013 → 23/09/2016
Number of participants: 8
Phd Student: Cereser, Alberto (Intern)
Supervisor: Hall, Stephen A. (Ekstern)
Steuwer, Axel (Ekstern)
Strobl, Markus (Ekstern)
Main Supervisor: Schmidt, Søren (Intern)
Examiner: Poulsen, Henning Friis (Intern)
Kardjilov, Nikolay (Ekstern)
Lienert, Ulrich (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: 1/3 FUU, 1/3 inst 1/3 Andet

Relations
Publications:
Time-of-flight 3D Neutron Diffraction for Multigrain Crystallography
Project: PhD

**Nanofabrication of Next-Generation X-Ray Optical Components**
Department of Physics
Period: 15/12/2012 → 28/04/2016
Number of participants: 7
Phd Student:
Stöhr, Frederik (Intern)
Supervisor:
Hansen, Ole (Intern)
Jensen, Flemming (Intern)
Main Supervisor:
Poulsen, Henning Friis (Intern)
Examiner:
Thomsen, Erik Vilain (Intern)
Franssila, Sami (Ekstern)
Schroer, Christian Gustav (Ekstern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Methods to determine fast-ion distribution functions from multidiagnostic measurements
Department of Physics
Period: 01/09/2012 → 09/12/2015
Number of participants: 6
Phd Student:
Jacobsen, Asger Schou (Intern)
Supervisor:
Salewski, Mirko (Intern)
Main Supervisor:
Naulin, Volker (Intern)
Examiner:
Poulsen, Henning Friis (Intern)
Bindslev, Henrik (Intern)
Sharapov, Sergei (Ekstern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU) Samf.
Project: PhD

Miljøvenlige, organiske solceller med kontrolleret nanostruktur, baseret på partikler i vandig dispersion
Department of Energy Conversion and Storage
Period: 01/06/2012 → 30/09/2015
Number of participants: 6
Phd Student:
Pedersen, Emil Bøje Lind (Intern)
Supervisor:
Aanaes, Henrik (Intern)
Main Supervisor:
Andreasen, Jens Wenzel (Intern)
Examiner:
Poulsen, Henning Friis (Intern)
Müller, Christian (Ekstern)
Stingelin-Stutzmann, Natalie (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

3D Studies of Coarsening Kinetics of Individual Grains
Department of Energy Conversion and Storage
Period: 01/09/2008 → 29/03/2012
Number of participants: 6
Phd Student:
Poulsen, Stefan Othmar (Intern)
Supervisor:
Juul Jensen, Dorte (Intern)
Main Supervisor:
Lauridsen, Erik Mejdal (Intern)
Examiner:
Poulsen, Henning Friis (Intern)
Moelans, Nele (Ekstern)
Rollett, Anthony David (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Synchrotron studies and modelling of the dynamics of dislocation structures
Risø National Laboratory for Sustainable Energy
Period: 01/03/2008 → 31/08/2011
Number of participants: 6
Phd Student:
Wejdemann, Christian (Intern)
Supervisor:
Poulsen, Henning Friis (Intern)
Main Supervisor:
Pantleon, Wolfgang (Intern)
Examiner:
Juul Jensen, Dorte (Intern)
Bouvier, Salima (Ekstern)
Ungár, Tamás (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Strukturelle egenskaber af superledende BSCCO/Ag bånd under afkøling
Department of Physics
Period: 01/02/1998 → 18/09/2001
Number of participants: 7
Phd Student:
Egeberg, Lotte Gottschalck (Intern)
Supervisor:
Hansen, Jern Otto Bindslev (Ekstern)
Poulsen, Henning Friis (Intern)
Main Supervisor:
Jacobsen, Claus Schelde (Intern)
Examiner:
Gerward, Leif (Intern)
Majelski, Peter (Ekstern)
Tholen, Anders Ragnar (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: Risø (Løn)
Project: PhD

Activities:

X-ray imaging methods for mapping orientations and strains in grains
Period: 20 Nov 2009
Henning Friis Poulsen (Speaker)
Risø National Laboratory for Sustainable Energy
Materials Research Division
Metal Structures in Four Dimensions

Description
Place: Seminar at Kyoto University (JP)

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

3DXRD - potential applications at PETRA
Period: 23 Jun 2009
Henning Friis Poulsen (Speaker)
Risø National Laboratory for Sustainable Energy
Materials Research Division
Metal Structures in Four Dimensions

Description
Place: Meeting on Grain-strain characterisation, Hamburg (DE)

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

3DXRD studies of nano-metals
Henning Friis Poulsen (Speaker)
Risø National Laboratory for Sustainable Energy
Materials Research Division
Metal Structures in Four Dimensions

Description
Place: Sino-Danish Workshop on Automated Characterization of Metallic Nanostructures

Related external organisation