Søren Schmidt - DTU Orbit (19/07/2017)

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Department of Physics - Senior Scientist

Neutrons and X-rays for Materials Physics

Publications:

**Electromechanical Response of Polycrystalline Barium Titanate Resolved at the Grain Scale**
Publication: Research - peer-review › Journal article – Annual report year: 2016

**Grain interaction mechanisms leading to intragranular orientation spread in tensile deformed bulk grains of interstitial-free steel**
Publication: Research - peer-review › Journal article – Annual report year: 2016

**Direct observation of grain rotations during coarsening of a semisolid Al-Cu alloy**
Publication: Research - peer-review › Conference article – Annual report year: 2016

**Heterogeneous grain-scale response in ferroic polycrystals under electric field**
Daniels, J. E., Majkut, M., Cao, Q., Schmidt, S., Wright, J., Jo, W. & Oddershede, J. 2016 In : Scientific Reports. 6, 7 p., 22820
Publication: Research - peer-review › Journal article – Annual report year: 2016

**Mapping of strain mechanisms in barium titanate by three-dimensional X-ray diffraction**
Majkut, M., Schmidt, S. & Oddershede, J. 2016 Department of Physics, Technical University of Denmark. 159 p.
Publication: Research › Ph.D. thesis – Annual report year: 2016

**Robust structural identification via polyhedral template matching**
Larsen, P. M., Schmidt, S. & Schiøtz, J. 2016 In : Modelling and Simulation in Materials Science and Engineering. 24, 5, 18 p., 055007
Publication: Research - peer-review › Journal article – Annual report year: 2016

**Time-of-flight 3D Neutron Diffraction for Multigrain Crystallography**
Publication: Research › Ph.D. thesis – Annual report year: 2016

**3D Neutron Diffraction**
Publication: Research - peer-review › Poster – Annual report year: 2015

**3D Neutron Diffraction**
Publication: Research - peer-review › Poster – Annual report year: 2015

**Dark-field X-ray microscopy for multiscale structural characterization**
Materials characterisation tools towards lead-free piezoceramics

On the deformation twinning of Mg AZ31B: A three-dimensional synchrotron X-ray diffraction experiment and crystal plasticity finite element model

Quantitative grain-scale ferroic domain volume fractions and domain switching strains from three-dimensional X-ray diffraction data
Oddershede, J., Majkut, M., Caosyd, Q., Schmidt, S., Wright, J. P., Kenesei, P. & Daniels, J. E. 2015 In : Journal of Applied Crystallography. 48, p. 882-889

3D-Ray Diffraction Microscopy

A spherical x-ray transform and hypercube sections
Kazantsev, I. G. & Schmidt, S. 2014 In : Journal of Inverse and Ill-Posed Problems. 22, 4, p. 537-550

Direct observation of grain boundary migration during recrystallization within the bulk of a moderately deformed aluminium single crystal

Grain centre mapping - 3DXRD measurements of average grain characteristics.

GrainSpotter: a fast and robust polycrystalline indexing algorithm
Schmidt, S. 2014 In : Journal of Applied Crystallography. 47, 1, p. 276-284

Novel applications of the x-ray tracing software package McXtrace

McXtrace: A Monte Carlo software package for simulating X-ray optics, beamlines and experiments
Sparse Image Reconstruction in Computed Tomography
Publication: Research › Ph.D. thesis – Annual report year: 2013

High Resolution Orientation Distribution Function
Publication: Research - peer-review › Conference article – Annual report year: 2011

Measuring the stress field around an evolving crack in tensile deformed Mg AZ31 using three-dimensional X-ray diffraction
Publication: Research - peer-review › Journal article – Annual report year: 2012

Multigrain crystallography
Publication: Research - peer-review › Journal article – Annual report year: 2012

New 3DXRD results on recrystallization and grain growth
Publication: Research - peer-review › Conference article – Annual report year: 2012

Non-destructive identification of micrometer-scale minerals and their position within a bulk sample
Publication: Research - peer-review › Journal article – Annual report year: 2012

Quantification of mineral behavior in four dimensions: Grain boundary and substructure dynamics in salt
Publication: Research - peer-review › Journal article – Annual report year: 2012

The application of in-situ 3D X-ray diffraction in annealing experiments: First interpretation of substructure development in deformed NaCl
Publication: Research - peer-review › Conference article – Annual report year: 2012

3D grain orientation mapping in the transmission electron microscope
Publication: Research › Conference abstract for conference – Annual report year: 2011

3D grain orientation mapping of polycrystals on scales from 1 mm to 1 nm using 3D-XRD and TEM
Publication: Research › Conference abstract for conference – Annual report year: 2011

A Monte Carlo approach for simulating the propagation of partially coherent x-ray beams
Publication: Research - peer-review › Conference article – Annual report year: 2011
Measuring type-II stresses using 3XRD
Oddershede, J., Schmidt, S., Poulsen, H. F. & Reimers, W. 2010
Publication: Research › Poster – Annual report year: 2010

Monitoring grain boundary migration during recrystallisation using topotomography
Publication: Research - peer-review › Conference article – Annual report year: 2010

Phase retrieval for superposed signals from multiple binary objects
Publication: Research - peer-review › Journal article – Annual report year: 2010

The extension of ID11 for nanoscale and hierarchical characterization
Publication: Research - peer-review › Conference article – Annual report year: 2010

A discrete spherical X-ray transform of orientation distribution functions using bounding cubes
Publication: Research - peer-review › Journal article – Annual report year: 2009

An algorithm for determining crystal lattices in unknown polycrystalline compounds
Schmidt, S. 2009
Publication: Research › Conference abstract for conference – Annual report year: 2009

Closing the gap between single crystal and powder diffraction
Sørensen, H. O., Schmidt, S., Wright, J., Hansen, P. C. & Poulsen, H. F. 2009
Publication: Research › Paper – Annual report year: 2009

Direct non-destructive observation of bulk nucleation in 30% deformed aluminum
Publication: Research - peer-review › Journal article – Annual report year: 2009

Integrated intensities based on grain orientation distribution functions
Sørensen, H. O., Wright, J., Schmidt, S., Hansen, P. C. & Poulsen, H. F. 2009
Publication: Research › Paper – Annual report year: 2009

Mapping the elastic strains of individual grains in a polycrystalline material using 3DXRD
Oddershede, J., Schmidt, S., Poulsen, H. F., Sørensen, H. O. & Reimers, W. 2009
Publication: Research › Conference abstract for conference – Annual report year: 2009

McXtrace - An X-ray Monte Carlo Ray-tracing software package
Publication: Research › Conference abstract in proceedings – Annual report year: 2009
Measuring residual stresses of individual grains in polycrystalline materials using 3DXRD
Oddershede, J., Schmidt, S., Poulsen, H. F. & Reimers, W. 2009
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
Publication: Research - peer-review › Conference article – Annual report year: 2009

Measuring the elastic strain of individual grains in polycrystalline materials
Oddershede, J., Schmidt, S., Poulsen, H. F., Sørensen, H. O. & Reimers, W. 2009
Publication: Research › Sound/Visual production (digital) – Annual report year: 2009

Measuring the elastic strain of individual grains in polycrystalline materials
Oddershede, J., Schmidt, S., Poulsen, H. F., Sørensen, H. O. & Reimers, W. 2009
Publication: Research › Sound/Visual production (digital) – Annual report year: 2009

Multigrain crystallography - why bother?
Publication: Research › Conference abstract for conference – Annual report year: 2009

New opportunities for 3D materials science of polycrystalline materials at the micrometre lengthscale by combined use of X-ray diffraction and X-ray imaging
Publication: Research - peer-review › Journal article – Annual report year: 2009

Strip detector for nanoscale resolution
Publication: Research › Sound/Visual production (digital) – Annual report year: 2009

Structured scintillators for X-ray imaging with micrometre resolution
Publication: Research - peer-review › Journal article – Annual report year: 2009

Time Evolution In 3D Metal Microstructures-Recrystallization
Publication: Research - peer-review › Journal article – Annual report year: 2009

3D x-ray diffraction microscope
Publication: Research - peer-review › Book chapter – Annual report year: 2008

A high-spatial-resolution three-dimensional detector array for 30-200 keV X-rays based on structured scintillators
Publication: Research - peer-review › Journal article – Annual report year: 2008
Direct observation of 3-D grain growth in Al–0.1% Mn
Publication: Research - peer-review › Journal article – Annual report year: 2008

Experimental quantification of nucleation
Publication: Research - peer-review › Article in proceedings – Annual report year: 2008

Measuring the elastic strain of individual grains in polycrystalline materials
Publication: Research › Sound/Visual production (digital) – Annual report year: 2008

Molecular dynamics simulations of grain boundary migration during recrystallization employing tilt and twist dislocation boundaries to provide the driving pressure
Publication: Research - peer-review › Journal article – Annual report year: 2008

Novel synchrotron based techniques for characterization of energy materials
Publication: Research - peer-review › Article in proceedings – Annual report year: 2008

Three-dimensional geometric simulations of random anisotropic growth during transformation phenomena
Publication: Research - peer-review › Journal article – Annual report year: 2007

X-ray diffraction contrast tomography: a novel technique for three-dimensional grain mapping of polycrystals. 1. Direct beam case
Publication: Research - peer-review › Journal article – Annual report year: 2008

Atomistisk simulering af rekrystallisation
Publication: Research › Article in proceedings – Annual report year: 2007

Development of a high-efficiency high-resolution imaging detector for 30–80 keV X-rays
Publication: Research - peer-review › Conference article – Annual report year: 2007

Effects of distributions of growth rates on recrystallization kinetics and microstructure
Publication: Research - peer-review › Journal article – Annual report year: 2007

High-resolution three-dimensional mapping of individual grains in polycrystals by totopotomography
Mapping partially recrystallised structures by 3DXRD
Publication: Research - peer-review › Journal article – Annual report year: 2007

Misorientation aspects of growth during recrystallisation
Publication: Research - peer-review › Conference article – Annual report year: 2007

Simulation of recrystallization using molecular dynamics; Effects of the interatomic potential
Publication: Research - peer-review › Conference article – Annual report year: 2007

Simulations of boundary migration during recrystallization using molecular dynamics
Publication: Research - peer-review › Journal article – Annual report year: 2007

Analytical expression for the evolution of interfacial area density between transformed grains during nucleation and growth transformations
Rios, P. R., Godiksen, R. B., Schmidt, S., Juul Jensen, D. & Vandermeer, R. A. 2006 In : Scripta Materialia. 54, 8, p. 1509-1513
Publication: Research - peer-review › Journal article – Annual report year: 2006

Mapping grains and their dynamics in three dimensions
Publication: Research - peer-review › Conference article – Annual report year: 2006

Non-destructive characterization of recrystallization kinetics using three-dimensional X-ray diffraction microscopy
Publication: Research - peer-review › Journal article – Annual report year: 2006

X-ray microscopy in four dimensions
Publication: Research - peer-review › Journal article – Annual report year: 2006

Algorithms and instrumentation for generating 3D grain maps in polycrystals by 3DXRD
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
Publication: Research - peer-review › Journal article – Annual report year: 2005

Mapping grains and their dynamics in 3 dimensions
Publication: Research › Conference abstract for conference – Annual report year: 2005
Metal structures in four dimensions
Publication: Research - peer-review › Journal article – Annual report year: 2005

Total crystallography: 3DXRD for molecular compounds
Serensen, H. O., Schmidt, S., Vaughan, G. B. M. & Poulsen, H. F. 2005
Publication: Research › Conference abstract for conference – Annual report year: 2005

Towards atomic level simulations of recrystallisation - setting up suitable geometry
Publication: Research - peer-review › Journal article – Annual report year: 2005

3DXRD - Mapping grains and their dynamics in 3 dimensions
Publication: Research - peer-review › Conference article – Annual report year: 2004

A method for in-situ measurements of the growth in the bulk of deformed single crystals at the 3DXRD microscope
Publication: Research › Article in proceedings – 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
Publication: Research - peer-review › Journal article – Annual report year: 2004

Growth aspects of recrystallization
Publication: Research - peer-review › Conference article – Annual report year: 2004

In-situ measurements of growth of nuclei within the bulk of deformed aluminum single crystals
Publication: Research - peer-review › Conference article – Annual report year: 2004

Investigating the effect of grain interaction during plastic deformation of copper
Publication: Research - peer-review › Journal article – Annual report year: 2004

Lattice rotations of individual bulk grains. Part 2: Correlation with initial orientation and model comparison
Publication: Research - peer-review › Journal article – Annual report year: 2004

Multicrystal approach to crystal structure solution and refinement
Publication: Research - peer-review › Journal article – Annual report year: 2004

Non-destructive characterisation of grain boundaries in 3D
Publication: Research - peer-review › Conference article – Annual report year: 2004
Simultaneous measurement of the strain tensor of 10 individual grains embedded in an Al tensile sample
Publication: Research - peer-review › Conference article – Annual report year: 2004

Watching the growth of bulk grains during recrystallization of deformed metals
Publication: Research - peer-review › Journal article – Annual report year: 2004

3DXRD microscopy (Invited talk)
Publication: Research › Conference abstract in proceedings – Annual report year: 2003

Growth kinetics of individual grains during recrystallization with an intermediate cooling cycle
Publication: Research - peer-review › Journal article – Annual report year: 2003

In situ characterisation of thermomechanical processes
Publication: Research › Article in proceedings – Annual report year: 2003

Non-destructive mapping of grains in three dimensions
Publication: Research - peer-review › Journal article – Annual report year: 2003

Recrystallization at the 3DXRD microscope
Publication: Research › Article in proceedings – Annual report year: 2003

Recrystallization kinetics of individual bulk grains in a commercial aluminium alloy
Publication: Research › Conference abstract in proceedings – Annual report year: 2003

The three-dimensional X-ray diffraction microscope: 3D maps of grains and grain dynamics in polycrystalline materials
Publication: Research - peer-review › Journal article – Annual report year: 2003

3D røntgen mikroskopet
Publication: Research › Article in proceedings – Annual report year: 2002

A computer simulating tool for 3DXRD microscope
Publication: Research › Conference abstract in proceedings – Annual report year: 2002
In-situ characterization of thermomechanical processes
Publication: Research › Conference abstract for conference – Annual report year: 2002

Investigation of recrystallization texture evolution during annealing of hot deformed AA3104 alloy
Publication: Research - peer-review › Conference article – Annual report year: 2002

Lattice rotations of individual bulk grains during deformation
Publication: Research - peer-review › Conference article – Annual report year: 2002

Observation of high-resolution diffraction profiles from single grains within polycrystalline metals
Publication: Research › Conference abstract for conference – Annual report year: 2002

Structural refinement of the individual grains in a polycrystal
Publication: Research › Conference abstract in proceedings – Annual report year: 2002

Texture evolution during hot deformation and annealing of AA5182 alloy
Publication: Research - peer-review › Conference article – Annual report year: 2002

Growth kinetics of individual cube grains as studied by the 3D X-ray diffraction microscope
Publication: Research - peer-review › Article in proceedings – Annual report year: 2001

Quantification of minor texture components by hard X-rays
Publication: Research - peer-review › Journal article – Annual report year: 2001

Three-dimensional maps of grain boundaries and the stress state of individual grains in polycrystals and powders
Publication: Research - peer-review › Journal article – Annual report year: 2001

Tracking: A method for structural characterization of grains in powders or polycrystals
Publication: Research - peer-review › Journal article – Annual report year: 2001

Projects:

3D electron microscopy of nanostructures in energy devices
Colding-Jørgensen, S., Kuhn, L. T., Schmidt, S. & Simonsen, S. B. 01/08/2017 → 31/07/2020
Project: PhD
Advanced neutron imaging of energy devices in 2D and 3D
Lacatusu, M., Kuhn, L. T., Schmidt, S. & Strobl, M.
15/12/2016 → 14/12/2019
Project: PhD

Characterization of Nanomaterials with Experimental Measurements and Atomistic Simulations
Larsen, P. M., Schiøtz, J. & Schmidt, S.
01/09/2014 → 31/08/2017
Project: PhD

Multi-scale mapping of strain mechanisms in lead-free piezoceramics
Majkut, M., Schmidt, S., Oddershede, J., Poulsen, H. F., Clausen, B. & Grant Webber, K.
15/03/2013 → 22/06/2016
Project: PhD

3D Neutron Diffraction (3DND) methodology
15/02/2013 → 23/09/2016
Project: PhD

FTP-PIEZO Multi-scale mapping of strain mechanisms in lead-free piezoceramics
Oddershede, J., Schmidt, S. & Majkut, M.
01/01/2013 → 14/03/2016
Project

Tomography with Prior Information
01/10/2009 → 17/06/2013
Project: PhD