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Organisations

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25/02/2012 → present
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Publications:

Observations of interplanetary dust by the Juno magnetometer investigation
One of the Juno magnetometer investigation's star cameras was configured to search for unidentified objects during Juno's transit en route to Jupiter. This camera detects and registers luminous objects to magnitude 8. Objects persisting in more than five consecutive images and moving with an apparent angular rate of between 2 and 18,000 arcsec/s were recorded. Among the objects detected were a small group of objects tracked briefly in close proximity to the spacecraft. The trajectory of these objects demonstrates that they originated on the Juno spacecraft, evidently excavated by micrometeoroid impacts on the solar arrays. The majority of detections occurred just prior to and shortly after Juno's transit of the asteroid belt. This rather novel detection technique utilizes the Juno spacecraft's prodigious 60 m² of solar array as a dust detector and provides valuable information on the distribution and motion of interplanetary (>µm sized) dust.

General information
State: Accepted/In press
Organisations: National Space Institute, Measurement and Instrumentation Systems, University of Copenhagen, NASA Goddard Space Flight Center, Southwest Research Institute, Jet Propulsion Laboratory, California Institute of Technology
Authors: Benn, M. (Intern), Jørgensen, J. L. (Intern), Denver, T. (Intern), Brauer, P. (Intern), Jørgensen, P. S. (Intern), Andersen, A. C. (Ekstern), Connerney, J. E. P. (Ekstern), Oliversen, R. J. (Ekstern), Bolton, S. J. (Ekstern), Levin, S. M. (Ekstern)

Number of pages: 8
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Geophysical Research Letters
ISSN (Print): 0094-8276
Ratings:
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 2.91 SNIP 1.499
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 3.324 SNIP 1.496
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 3.315 SNIP 1.532
Web of Science (2014): Indexed yes
Observations of MeV electrons in Jupiter's innermost radiation belts and polar regions by the Juno radiation monitoring investigation: Perijoves 1 and 3

Juno's “Perijove 1” (27 August 2016) and “Perijove 3” (11 December 2016) flybys through the innermost region of Jupiter’s magnetosphere (radial distances <2 Jovian radii, 1.06 RJ at closest approach) provided the first in situ look at this region's
radiation environment. Juno's Radiation Monitoring Investigation collected particle counts and noise signatures from penetrating high-energy particle impacts in images acquired by the Stellar Reference Unit and Advanced Stellar Compass star trackers, and the Jupiter Infrared Auroral Mapper infrared imager. This coordinated observation campaign sampled radiation at the inner edges of the high-latitude lobes of the synchrotron emission region and more distant environments. Inferred omnidirectional >5 MeV and >10 MeV electron fluxes derived from these measurements provide valuable constraints for models of relativistic electron environments in the inner radiation belts. Several intense bursts of high-energy particle counts were also observed by the Advanced Stellar Compass in polar regions outside the radiation belts.

**General information**

State: Published  
Organisations: National Space Institute, Measurement and Instrumentation Systems, California Institute of Technology, Southwest Research Institute, National Institute for Astrophysics, 5Space Research Corporation, University of California at Los Angeles  
Pages: 4481–4488  
Publication date: 2017  
Main Research Area: Technical/natural sciences

**Publication information**

Journal: Geophysical Research Letters  
Volume: 44  
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ISSN (Print): 0094-8276  
Ratings:  
BFI (2017): BFI-level 1  
BFI (2016): BFI-level 1  
Scopus rating (2016): SJR 2.91 SNIP 1.499  
Web of Science (2016): Indexed yes  
BFI (2015): BFI-level 1  
Scopus rating (2015): SJR 3.324 SNIP 1.496  
Web of Science (2015): Indexed yes  
BFI (2014): BFI-level 1  
Scopus rating (2014): SJR 3.315 SNIP 1.532  
Web of Science (2014): Indexed yes  
BFI (2013): BFI-level 1  
Scopus rating (2013): SJR 3.461 SNIP 1.704  
ISI indexed (2013): ISI indexed yes  
Web of Science (2013): Indexed yes  
BFI (2012): BFI-level 1  
Scopus rating (2012): SJR 3.317 SNIP 1.579  
ISI indexed (2012): ISI indexed yes  
Web of Science (2012): Indexed yes  
BFI (2011): BFI-level 1  
Scopus rating (2011): SJR 3.113 SNIP 1.56  
ISI indexed (2011): ISI indexed yes  
Web of Science (2011): Indexed yes  
BFI (2010): BFI-level 1  
Scopus rating (2010): SJR 3.099 SNIP 1.417  
Web of Science (2010): Indexed yes  
BFI (2009): BFI-level 1  
Scopus rating (2009): SJR 2.848 SNIP 1.392  
Web of Science (2009): Indexed yes  
BFI (2008): BFI-level 2  
Scopus rating (2008): SJR 2.595 SNIP 1.318  
Web of Science (2008): Indexed yes
The Juno Magnetic Field Investigation

The Juno Magnetic Field investigation (MAG) characterizes Jupiter’s planetary magnetic field and magnetosphere, providing the first globally distributed and proximate measurements of the magnetic field of Jupiter. The magnetic field instrumentation consists of two independent magnetometer sensor suites, each consisting of a tri-axial Fluxgate Magnetometer (FGM) sensor and a pair of co-located imaging sensors mounted on an ultra-stable optical bench. The imaging system sensors are part of a subsystem that provides accurate attitude information (to ~20 arcsec on a spinning spacecraft) near the point of measurement of the magnetic field. The two sensor suites are accommodated at 10 and 12 m from the body of the spacecraft on a 4 m long magnetometer boom affixed to the outer end of one of its three solar array assemblies. The magnetometer sensors are controlled by independent and functionally identical electronics boards within the magnetometer electronics package mounted inside Juno’s massive radiation shielded vault. The imaging sensors are controlled by a fully hardware redundant electronics package also mounted within the radiation vault. Each magnetometer sensor measures the vector magnetic field with 100 ppm absolute vector accuracy over a wide dynamic range (to 16 Gauss = $1.6 \times 10^6$ per axis) with a resolution of ~0.05 nT in the most sensitive dynamic range (±1600 nT per axis). Both magnetometers sample the magnetic field simultaneously at an intrinsic sample rate of 64 vector samples per second. The magnetic field instrumentation may be reconfigured in flight to meet unanticipated needs and is fully hardware redundant. The attitude determination system compares images with an on-board star catalog to provide attitude solutions (quaternions) at a rate of up to 4 solutions per second, and may be configured to acquire images of selected targets for science and engineering analysis. The system tracks and catalogs objects that pass through the imager field of view and also provides a continuous record of radiation exposure. A spacecraft magnetic control program was implemented to provide a magnetically clean environment for the magnetic sensors, and residual spacecraft fields and/or sensor offsets are monitored in flight taking advantage of Juno’s spin (nominally 2 rpm) to separate environmental fields from those that rotate with the spacecraft.

General information

State: Accepted/In press
Authors: Connerney, J. E. P. (Ekstern), Benn, M. (Intern), Bjarnø, J. B. (Intern), Denver, T. (Intern), Espley, J. (Ekstern), Jørgensen, J. L. (Intern), Jørgensen, P. S. (Intern), Lawton, P. (Ekstern), Malinnikova Bang, A. (Intern), Merayo, J. M. (Intern), Murphy, S. (Ekstern), Odom, J. (Ekstern), Oliversen, R. (Ekstern), Schnurr, R. (Ekstern), Sheppard, D. (Ekstern), Smith, E. J. (Ekstern)
Number of pages: 100
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Space Science Reviews
The Juno Radiation Monitoring (RM) Investigation

The Radiation Monitoring Investigation of the Juno Mission will actively retrieve and analyze the noise signatures from penetrating radiation in the images of Juno’s star cameras and science instruments at Jupiter. The investigation’s objective is to profile Jupiter’s > 10-MeV electron environment in regions of the Jovian magnetosphere which today are still largely unexplored. This paper discusses the primary instruments on Juno which contribute to the investigation’s data suite, the measurements of camera noise from penetrating particles, spectral sensitivities and measurement ranges of the instruments, calibrations performed prior to Juno’s first science orbit, and how the measurements may be used to infer the external relativistic electron environment.
MicroASC instrument onboard Juno spacecraft utilizing inertially controlled imaging

This contribution describes the post-processing of the raw image data acquired by the microASC instrument during the Earth-fly-by of the Juno spacecraft. The images show a unique view of the Earth and Moon system as seen from afar. The procedure utilizes attitude measurements and inter-calibration of the Camera Head Units of the microASC system to trigger the image capturing. The triggering is synchronized with the inertial attitude and rotational phase of the sensor acquiring the images. This is essentially works as inertially controlled imaging facilitating image acquisition from unexplored perspectives of moons, asteroids, icy rocks and planetary rings.

General information
State: Published
Organisations: National Space Institute, Measurement and Instrumentation Systems
Pages: 308-315
Publication date: 2016
Main Research Area: Technical/natural sciences

Publication information
Journal: Acta Astronautica
Volume: 118
ISSN (Print): 0094-5765
Ratings:
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.732 SNIP 2.017
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.721 SNIP 1.73
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.731 SNIP 1.714
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.615 SNIP 1.447
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.54 SNIP 1.268
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.504 SNIP 1.266
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.414 SNIP 1.177
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.32 SNIP 0.909
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.342 SNIP 0.787
Scopus rating (2007): SJR 0.288 SNIP 0.823
Scopus rating (2006): SJR 0.337 SNIP 0.92
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.286 SNIP 0.665
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 0.297 SNIP 0.799
Scopus rating (2003): SJR 0.288 SNIP 0.72
Scopus rating (2002): SJR 0.317 SNIP 0.796
Scopus rating (2001): SJR 0.235 SNIP 0.472
Scopus rating (2000): SJR 0.405 SNIP 0.562
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 0.243 SNIP 0.422
Original language: English
Attitude, Earth fly-by, Image processing, Juno, Star tracker
DOIs:
10.1016/j.actaastro.2015.11.001
Source: FindIt
Source-ID: 2287885639
Publication: Research - peer-review › Journal article – Annual report year: 2015

A search for minor bodies in the Jovian tenuous ring system

General information
State: Published
Organisations: National Space Institute, Measurement and Instrumentation Systems
Authors: Malinnikova Bang, A. (Intern), Jørgensen, J. L. (Intern), Connerney, J. E. (Ekstern), Benn, M. (Intern), Denver, T. (Intern), Oliversen, R. J. (Ekstern), Lawton, P. (Ekstern)
Number of pages: 1
Publication date: 2013
Event: Poster session presented at AGU Fall Meeting 2013, San Francisco, United States.
Main Research Area: Technical/natural sciences
Publication: Research - peer-review › Poster – Annual report year: 2013

Juno Magnetometer Observations in the Earth's Magnetosphere

General information
State: Published
Organisations: National Space Institute, Measurement and Instrumentation Systems, IT-Department
Authors: Connerney, J. E. (Ekstern), Oliversen, R. J. (Ekstern), Espley, J. R. (Ekstern), MacDowall, R. J. (Ekstern), Schnurr, R. (Ekstern), Sheppard, D. (Ekstern), Odom, J. (Ekstern), Lawton, P. (Ekstern), Murphy, S. (Ekstern), Jørgensen, J. L. (Intern), Jørgensen, P. S. (Intern), Merayo, J. M. (Intern), Denver, T. (Intern), Bloxham, J. (Ekstern), Smith, E. J. (Ekstern), Murphy, N. (Ekstern)
Number of pages: 1
Publication date: 2013
Event: Poster session presented at AGU Fall Meeting 2013, San Francisco, United States.
Main Research Area: Technical/natural sciences
Publication: Research - peer-review › Poster – Annual report year: 2013

Opportunity Science Using the Juno Magnetometer Investigation Star Trackers

General information
State: Published
Organisations: National Space Institute, Measurement and Instrumentation Systems
Authors: Jørgensen, J. L. (Intern), Connerney, J. E. (Ekstern), Malinnikova Bang, A. (Intern), Denver, T. (Intern), Oliversen, R. J. (Ekstern), Benn, M. (Intern), Lawton, P. (Ekstern)
Number of pages: 1
Publication date: 2013
Event: Poster session presented at AGU Fall Meeting 2013, San Francisco, United States.
Main Research Area: Technical/natural sciences
Publication: Research - peer-review › Poster – Annual report year: 2013

On-the Fly Merging of Attitude Solutions
Recent advances in autonomous attitude determination instrumentation enable even small satellites flying fully autonomous multi head star trackers providing full accurate and robust attitude information. Each sensor provides the full attitude information but for robustness and optimal usage of the available information, i.e. optimal accuracy, methods for merging such data should be investigated. The need for and desirability of attitude merging depends on the mission objective and available resources. To enable real-time attitude control and reduce requirements on download budget, on-
board merging of attitude data will often be advantageous. This should be weighted against the need for post observation reconstruction of attitudes, especially needed when end products are sensitive to optimal attitude reconstruction. Instrument integrated merging algorithms will reduce the complexity of on-board AOCS. Methods for attitude merging are many. Two examples of merging methods taking into consideration anisotropic noise distributions are presented and discussed.

**General information**
State: Published
Organisations: Measurement and Instrumentation Systems, National Space Institute
Authors: Jørgensen, P. S. (Intern), Jørgensen, J. L. (Intern), Denver, T. (Intern)
Number of pages: 406
Pages: 175-183
Publication date: 2008

**Host publication information**
Title of host publication: Small Satellites for Earth Observation : Selected Contributions
Publisher: Springer
ISBN (Print): 978-1-4020-6942-0
Main Research Area: Technical/natural sciences
Conference: Small Satellites for Earth Observation, Berlin, 01/01/2007
DOI:
10.1007/978-1-4020-6943-7_16
Source: orbit
Source-ID: 220298
Publication: Research › Article in proceedings – Annual report year: 2008

**The Swarm Magnetometry Package**
The Swarm mission under the ESA’s Living Planet Programme is planned for launch in 2010 and consists of a constellation of three satellites at LEO. The prime objective of Swarm is to measure the geomagnetic field with unprecedented accuracy in space and time. The magnetometry package consists of an extremely accurate and stable vector magnetometer, which is co-mounted in an optical bench together with a start tracker system to ensure mechanical stability of the measurements.

**General information**
State: Published
Organisations: Measurement and Instrumentation Systems, National Space Institute, Management, Measurement & Instrumentation, Department of Electrical Engineering
Pages: 143-151
Publication date: 2008
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Small Satellites for Earth Observation
Original language: English
Source: orbit
Source-ID: 209856
Publication: Research - peer-review › Conference article – Annual report year: 2007

**Micro Advanced Stellar Compass, SWARM: Single Star Measurement – feasibility study, ASC-DTU-TR-3039**

**General information**
State: Published
Organisations: Measurement and Instrumentation Systems, National Space Institute
Authors: Denver, T. (Intern)
Publication date: 2007

**Publication information**
Publisher: EADS Astrium
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 209867
Proton Irradiation of SONY CCD, Image Analysis and Homogeneity Checks

General information
State: Published
Organisations: Measurement and Instrumentation Systems, National Space Institute, Measurement & Instrumentation, Department of Electrical Engineering
Authors: Denver, T. (Intern), Guldager, P. B. (Intern), Jørgensen, F. E. (Intern), Aage, H. K. (Ekstern), Thuesen, G. (Intern)
Publication date: 2007

Publication information
Publisher: ESA
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 209866
Publication: Research - peer-review › Report – Annual report year: 2007

Advanced stellar compass deep space navigation, ground testing results
Deep space exploration is in the agenda of the major space agencies worldwide and at least the European Space Agency (SMART & Aurora Programs) and the American NASA (New Millennium Program) have set up programs to allow the development and the demonstration of technologies that can reduce the risks and the costs of the deep space missions. Navigation is the Achilles' heel of deep space. Being performed on ground, it imposes considerable constraints on the system and the operations, it is very expensive to execute, especially when the mission lasts several years and, above all, it is not failure tolerant. Nevertheless, up to now, ground navigation has been the only possible solution. The technological breakthrough of advanced star trackers, like the micro-advanced stellar compass (mu ASC) might change this situation. Indeed, exploiting the capabilities of this instrument, the authors have devised a method to determine the orbit of a spacecraft autonomously, on-board and without any a priori knowledge of any kind. The solution is robust, elegant and fast. This paper presents the preliminary performances obtained during the ground tests. The results are very positive and encouraging.

General information
State: Published
Organisations: Department of Electrical Engineering, Measurement & Instrumentation
Pages: 1020-1028
Publication date: 2006
Main Research Area: Technical/natural sciences

Publication information
Journal: Acta Astronautica
Volume: 59
Issue number: 8-11
ISSN (Print): 0094-5765
Ratings:
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.732 SNIP 2.017
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.721 SNIP 1.73
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.731 SNIP 1.714
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.615 SNIP 1.447
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.54 SNIP 1.268
ISI indexed (2012): ISI indexed yes
Enhanced mission performance from autonomous instrument guidance

During the last decade improvements in electronics, on-board processing power and software design have lead to significant advances in the development of autonomous instrumentation for spacecraft use. The Advanced Stellar Compass (ASC) and the newly developed micro-ASC (mu ASC) are excellent examples of such autonomous space instrumentation. With its full autonomy, this star tracker is capable of providing, in real-time, the absolute orientation with respect to the celestial reference frame with an accuracy of a few arc seconds. This high accuracy along with the robust operations, low weight and power consumption makes the mu ASC an ideal instrument for small, high yielding satellite missions. The ASC has hitherto been used by the satellite AOCS and the high accuracy scientific instrument for attitude recovery (among others onboard ORSTED, CHAMP, and GRACE), and satellite high accuracy target acquisition and pointing (PROBA). Here three applications of the mu ASC as an autonomous onboard precision guide for precision vector instrumentation are presented. These are autonomous onboard antenna guidance, telescope guidance and tracking and high accuracy and wide range laser rangers.

General information
State: Published
Organisations: Measurement & Instrumentation, Department of Electrical Engineering
Authors: Jørgensen, J. L. (Intern), Jørgensen, P. S. (Intern), Betto, M. (Intern), Denver, T. (Intern), Tunon, L. (Ekstern)
Pages: 981-989
Publication date: 2006
Main Research Area: Technical/natural sciences

Publication information
Journal: Acta Astronautica
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ISSN (Print): 0094-5765
Ratings:
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.732 SNIP 2.017
Formation Flying Using an Optical Sensor (Advanced Technology Approaches)

General information
State: Published
Organisations: Measurement and Instrumentation Systems, National Space Institute
Authors: Jørgensen, J. L. (Intern), Denver, T. (Intern), Jørgensen, P. S. (Intern)
Number of pages: 371
Publication date: 2005

Host publication information
Title of host publication: Small Satellites for Earth Observation : gest of the 5th International Symposium of the IAA
Publisher: Wissenschaft & Technik Verlag
ISBN (Print): 3-89685-570-0
Main Research Area: Technical/natural sciences
Conference: Small Satellites for Earth Observation : Digest of the 5th International Symposium of the IAA, Berlin, 01/01/2005
Source: orbit
In-flight Quality and Accuracy of Attitude Measurements from the CHAMP Advanced Stellar Compass

The German geo-observations satellite CHAMP carries highly accurate vector instruments. The orientation of these relative to the inertial reference frame is obtained using star trackers. These advanced stellar compasses (ASC) are fully autonomous units, which provide, in real time, the absolute attitude with accuracy in the arc second range. In order to investigate the in-flight accuracy of the ASC, the terminology to characterize noise and biases is introduced. Relative instrument accuracy (RIA) and absolute instrument accuracy (AIA) can in principle be determined in-flight. However problems with modeling external noise sources often arise. The special CHAMP configuration with two star tracker cameras mounted fixed together provides an excellent opportunity to determine the AIA in-flight using the inter boresight angle.

General information
State: Published
Organisations: Measurement & Instrumentation, Department of Electrical Engineering
Authors: Jørgensen, P. S. (Intern), Jørgensen, J. L. (Intern), Denver, T. (Intern), Betto, M. (Ekstern)
Pages: 181-186
Publication date: 2005
Main Research Area: Technical/natural sciences

Publication information
Journal: Acta Astronautica
Volume: 56
Issue number: 1-2
Ratings:
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.732 SNIP 2.017
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.721 SNIP 1.73
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.731 SNIP 1.714
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.615 SNIP 1.447
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.54 SNIP 1.268
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.504 SNIP 1.266
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.414 SNIP 1.177
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.32 SNIP 0.909
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.342 SNIP 0.787
Scopus rating (2007): SJR 0.288 SNIP 0.823
Scopus rating (2006): SJR 0.337 SNIP 0.92
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.286 SNIP 0.665
Web of Science (2005): Indexed yes
Motion Compensation Techniques for Aerospace

General information
State: Published
Organisations: Department of Electrical Engineering
Authors: Denver, T. (Intern), Jørgensen, J. L. (Intern)
Publication date: 2005

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions:
Orsted2004-Troelz Denver-Motion Compensation Techniques for Aerospace.pdf
Source: orbit
Source-ID: 180634
Publication: Research › Ph.D. thesis – Annual report year: 2005

Satellite Star Tracker Performance

General information
State: Published
Organisations: Measurement & Instrumentation, Department of Electrical Engineering
Authors: Jørgensen, J. L. (Intern), Denver, T. (Intern), Betto, M. (Ekstern), Braembussche, P. V. D. (Ekstern)
Pages: 153-159
Publication date: 2005
Main Research Area: Technical/natural sciences

Publication information
Journal: Acta Astronautica
Volume: 56
Issue number: 1-2
Ratings:
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.732 SNIP 2.017
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.721 SNIP 1.73
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.731 SNIP 1.714
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.615 SNIP 1.447
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Star-Tracking in High Radiation Regime: In-Flight Results from the SMART-1 mission

General information
State: Published
Organisations: Measurement & Instrumentation, Department of Electrical Engineering
Authors: Denver, T. (Intern), Jørgensen, J. L. (Intern), Jørgensen, P. S. (Intern), Rathsman, P. (Ekstern)
Pages: 107-111
Publication date: 2005

Host publication information
Title of host publication: Digest of the 5th International Symposium of the IAA
Publisher: Wissenschaft & Technik Verlag
ISBN (Print): 3-89685-570-0
Main Research Area: Technical/natural sciences
Conference: Small Satellites for Earth Observation, Berlin, 01/01/2005
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The Micro Advanced Stellar Compass for ESA's PROBA 2 Mission

General information
State: Published
Organisations: Measurement and Instrumentation Systems, National Space Institute
Authors: Jørgensen, P. S. (Intern), Jørgensen, J. L. (Intern), Denver, T. (Intern), Breambussche, P. V. D. (Ekstern)
Pages: 299-303
The Proba Satellite Star Tracker Performance

ESA's PROBA satellite features a high degree of autonomy, both technologically and scientifically. It is build around a powerful command, data and AOCS controller and with its less than 100 kg it is a true microsatellite. The scientific mission of PROBA includes a scanning telescope, which calls for high pointing accuracy and agility. The Advanced Stellar Compass (ASC) provides the pointing knowledge with arc-second accuracy. A description of the PROBA ASC is given and various aspects of the ASC are treated: Handling of solar and lunar blinding and dark and lit Earth horizons in the field of view. The accuracy of the PROBA ASC is analyzed comparing the measurements from the ASC's two camera-heads. Investigation of this Inter-Boresight Angle demonstrates the spacecraft thermal flexures, and models this to arc-second level. The astronomical aberration corrector of the ASC is investigated and confirmed. Finally timing and radiation handling of the ASC is treated.
Advanced stellar compass - Onboard autonomous orbit determination, preliminary performance

Deep space exploration is in the agenda of the major space agencies worldwide; certainly the European Space Agency (SMART Program) and the American NASA (New Millennium Program) have set up programs to allow the development and the demonstration of technologies that can reduce the risks and the cost of deep space missions. From past experience, it appears that navigation is the Achilles heel of deep space missions. Performed on ground, this imposes considerable constraints on the entire system and limits operations. This makes it very expensive to execute, especially when the mission lasts several years and, furthermore, it is not failure tolerant. Nevertheless, to date, ground navigation has been the only viable solution. The technology breakthrough of advanced star trackers, like the advanced stellar compass (ASC), might change this situation. Indeed, exploiting the capabilities of this instrument, the authors have devised a method to determine the orbit of a spacecraft autonomously, onboard, and without a priori knowledge of any kind. The solution is robust and fast. This paper presents the preliminary performance obtained during the ground testing in August 2002 at the Mauna Kea Observatories. The main goals were: (1) to assess the robustness of the method in solving autonomously, onboard, the position lost-in-space problem; (2) to assess the preliminary accuracy achievable with a single planet and a single observation; (3) to verify the autonomous navigation (AutoNav) module could be implemented into an ASC without degrading the attitude measurements; and (4) to identify the areas of development and consolidation. The results obtained are very encouraging.

Advanced stellar compass - Onboard autonomous orbit determination, preliminary performance

Deep space exploration is in the agenda of the major space agencies worldwide; certainly the European Space Agency (SMART Program) and the American NASA (New Millennium Program) have set up programs to allow the development and the demonstration of technologies that can reduce the risks and the cost of deep space missions. From past experience, it appears that navigation is the Achilles heel of deep space missions. Performed on ground, this imposes considerable constraints on the entire system and limits operations. This makes it very expensive to execute, especially when the mission lasts several years and, furthermore, it is not failure tolerant. Nevertheless, to date, ground navigation has been the only viable solution. The technology breakthrough of advanced star trackers, like the advanced stellar compass (ASC), might change this situation. Indeed, exploiting the capabilities of this instrument, the authors have devised a method to determine the orbit of a spacecraft autonomously, onboard, and without a priori knowledge of any kind. The solution is robust and fast. This paper presents the preliminary performance obtained during the ground testing in August 2002 at the Mauna Kea Observatories. The main goals were: (1) to assess the robustness of the method in solving autonomously, onboard, the position lost-in-space problem; (2) to assess the preliminary accuracy achievable with a single planet and a single observation; (3) to verify the autonomous navigation (AutoNav) module could be implemented into an ASC without degrading the attitude measurements; and (4) to identify the areas of development and consolidation. The results obtained are very encouraging.
Autonomous Control of a mobile 20-inch outreach telescope using a star-tracker

General information
State: Published
Organisations: Department of Electrical Engineering
Authors: Denver, T. (Intern), Jørgensen, P. S. (Intern), Jørgensen, J. L. (Intern), Shelton, R. (Ekstern), Sousa, E. (Ekstern), Hoblitt, J. (Ekstern), Maberry, M. (Ekstern)
Publication date: 2003

Host publication information
Title of host publication: Proceedings of the 2003 AMOS Conference in Maui
Main Research Area: Technical/natural sciences
Conference: Advanced Maui Optical and Space Surveillance Technologies Conference, Maui, 01/01/2003
Source: orbit
Source-ID: 60856
Publication: Research › Article in proceedings – Annual report year: 2003
Autonomous Target Ranging Techniques

For the deep space asteroid mission, Bering, the main goal is the detection and tracking of near Earth objects (NEOs) and asteroids. One of the key science instruments is the 0.3-m telescope used for imaging and tracking of the detected asteroidal objects. For efficient use of the observation time of this telescope, a fast determination of the range to and the motion of the detected targets are important. This is needed in order to prepare the future observation strategy for each target, i.e. when is the closest approach where imaging will be optimal. In order to quickly obtain such a determination two ranging strategies are presented. One is an improved laser ranger with an effective range with non-cooperative targets of at least 10,000 km, demonstrated in ground tests. The accuracy of the laser ranging will be approximately 1 m. The laser ranger may furthermore be used for trajectory determination of nano-gravity probes, which will perform direct mass measurements of selected targets. The other is triangulation from two spacecraft. For this method it is important to distinguish between detection and tracking range, which will be different for Bering since different instruments are used for detection and tracking. Also, the baseline distance between the two spacecraft will provide two different (close and far) scenarios of observation. The limiting range and the relative range accuracies of the triangulation method are discussed.

General information
State: Published
Organisations: Department of Electrical Engineering
Authors: Jørgensen, P. S. (Intern), Jørgensen, J. L. (Intern), Denver, T. (Intern), Betto, M. (Intern), Tunon, L. (Ekstern)
Publication date: 2003

Host publication information
Title of host publication: Proceedings of International Conference on Recent Advances in Space Technologies, 2003. RAST '03.
Publisher: IEEE
ISBN (Print): 0-7803-8142-4
Main Research Area: Technical/natural sciences
Electronic versions:
Jørgensen.pdf
DOIs:
10.1109/RAST.2003.1303920

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Source: orbit
Source-ID: 60769
Publication: Research - peer-review › Article in proceedings – Annual report year: 2003

Bering Mission Navigation Method

"Bering", after the name of the famous Danish explorer, is a near Earth object (NEO) and main belt asteroids mapping mission envisaged by a consortium of Danish universities and research institutes. To achieve the ambitious goals set forth by this mission, while containing the costs and risks, "Bering" sports several new technological enhancements and advanced instruments under development at the Technical University of Denmark (DTU). The autonomous on-board orbit determination method is part of them and it is described in this paper.

General information
State: Published
Organisations: Department of Electrical Engineering
Pages: 239-244
Publication date: 2003

Host publication information
Title of host publication: Proceedings of the RAST Conference
Publisher: IEEE
ISBN (Print): 0-7803-8142-4
Main Research Area: Technical/natural sciences
Electronic versions:
Betto.pdf
DOIs:
The Bering Autonomous Target Detection

An autonomous asteroid target detection and tracking method has been developed. The method features near omnidirectionality and focus on high speed operations and completeness of search of the near space rather than the traditional faint object search methods, employed presently at the larger telescopes. The method has proven robust in operation and is well suited for use onboard spacecraft. As development target for the method and the associated instrumentation the asteroid research mission Bering has been used. Onboard a spacecraft, the autonomous detection is centered around the fully autonomous star tracker the Advanced Stellar Compass (ASC). One feature of this instrument is that potential targets are registered directly in terms of date, right ascension, declination, and intensity, which greatly facilitates both tracking search and registering. Results from ground and inflight tests are encouraging, both with respect to robustness, speed and accuracy, and demonstrates the span and range of applications of this technology.
The Bering Target Tracking Instrumentation

The key science instrument on the Bering satellite mission is a relative small telescope with an entrance aperture of 300 mm and a focal length between 500 and 1000 mm. The detection of potential targets is performed by one of the target scanning advanced stellar compasses (ASCs). This procedure results in a simple prioritized list of right ascension, declination, proper motion and intensity of each prospective target. The telescope itself has a dedicated ASC Camera Head Unit (CHU) mounted on the secondary mirror, largely co-aligned with the telescope. This CHU accurately determines the telescope's pointing direction. To achieve fast tracking over a large solid angle, the telescope pointing is achieved by means of a folding mirror in the optical pathway. When a prospective target approaches the telescope FOV, the ASC on the secondary will guide the folding mirror into position such that the target is inside the telescope FOV. During the telescope observation time, the ASC will constantly control the folding mirror to correctly position the target at the center of the telescope, basically performing a standard telescope tracking service. The telescope will alter the initial target acquisition track and observe the object of interest. To achieve milliarcsecond accuracy the telescope is equipped with a tip-tilt system on the secondary. The performance of the acquisition and telescope guidance has been tested and excellent noise, acquisition and settling time performance has been achieved. The operations have been verified for telescope focal lengths of 250 and 8000 mm.
The Micro ASC, a Miniature Star Tracker

General information
State: Published
Organisations: Department of Electrical Engineering
Pages: 157-162
Publication date: 2003

Host publication information
Title of host publication: Small Satellites for Earth Observation, 4th International Symposium of the International Academy of Astronautics
Main Research Area: Technical/natural sciences
Links:
Source: orbit
Source-ID: 60804
Publication: Research - peer-review › Article in proceedings – Annual report year: 2003

The Proba Satellite Star Tracker Performance

General information
State: Published
Organisations: Department of Electrical Engineering
Pages: 201-206
Publication date: 2003

Host publication information
Title of host publication: Abstract in Small Satellites for Earth Observation, 4th International Symposium of the International Academy of Astronautics
Main Research Area: Technical/natural sciences
Links:
Source: orbit
Source-ID: 60803
Publication: Research - peer-review › Article in proceedings – Annual report year: 2003

The Autonomy of the ASC In Flight Performance Compared to On-Ground Testing

General information
State: Published
Organisations: Department of Electrical Engineering
Authors: Denver, T. (Intern), Jørgensen, J. L. (Intern), Riis, T. (Ekstern), Betto, M. (Intern)
Pages: 351-358
Publication date: 2001

Host publication information
Title of host publication: ESA Workshop on On-Board Autonomy
Main Research Area: Technical/natural sciences
Links:
http://www.oersted.dtu.dk/publications/p.php?244
Source: orbit
Source-ID: 60456
Publication: Research - peer-review › Article in proceedings – Annual report year: 2001

3-D Reconstruction From Satellite Images: Master Thesis

General information
State: Published
Advanced Stellar Compass, Electrical Interface Control Document for Grace

General information
State: Published
Organisations: Department of Automation
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 171947
Publication: Research - peer-review › Report – Annual report year: 1999

ASC-PROBA Interface Control Document

General information
State: Published
Organisations: Department of Automation
Number of pages: 80
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 175710
Publication: Research - peer-review › Report – Annual report year: 1999

Autonomous Planetary 3-D Reconstruction From Satellite Images

General information
State: Published
Organisations: Department of Automation
Authors: Denver, T. (Intern)
Publication date: 1999

Host publication information
Title of host publication: Autonomous Planetary 3-D Reconstruction From Satellite Images
Main Research Area: Technical/natural sciences
Conference: The Sixth Internal Workshop on Human Interface Technology, Aizu-Wakamatsu, Japan, 01/01/1999
Source: orbit
Source-ID: 175556
Publication: Research - peer-review › Article in proceedings – Annual report year: 1999

Documentation for delivery of Star Tracker to ADEOS II

General information
Documentation for delivery of Star Tracker to CHAMP

General information
State: Published
Organisations: Department of Automation
Number of pages: 430
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 175645
Publication: Research - peer-review › Report – Annual report year: 1999

Documentation for delivery of Star Tracker to PROBA

General information
State: Published
Organisations: Department of Automation
Number of pages: 380
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 175643
Publication: Research - peer-review › Report – Annual report year: 1999

Documentation for delivery of Star Tracker to SAC-C

General information
State: Published
Organisations: Department of Automation
Number of pages: 190
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 175648
Publication: Research - peer-review › Report – Annual report year: 1999

General information
State: Published
Organisations: Department of Automation
Authors: Denver, T. (Intern), Jørgensen, J. L. (Intern), Riis, T. (Intern)
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 175639
Publication: Research - peer-review › Book – Annual report year: 1999

Proton Testing of Advanced Stellar Compass Digital Processing Unit

General information
State: Published
Organisations: Department of Automation
Authors: Thuesen, G. (Intern), Denver, T. (Intern), Jørgensen, F. E. (Intern)
Number of pages: 3
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 175587
Publication: Research - peer-review › Report – Annual report year: 1999

Radiation Evaluation of Hyundai HY5118160BTC60 1Mbitx16 DRAM

General information
State: Published
Organisations: Department of Automation
Authors: Thuesen, G. (Intern), Denver, T. (Intern), Jørgensen, F. E. (Intern)
Number of pages: 5
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 175586
Publication: Research - peer-review › Report – Annual report year: 1999

RFP for CNES micro satellite program.

General information
State: Published
Organisations: Department of Automation
Number of pages: 87
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 175653
RFP for Smiles and Maxi projects to the Internationale Space Station

General information
State: Published
Organisations: Department of Automation
Number of pages: 75
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 175660
Publication: Research - peer-review › Report – Annual report year: 1999

RFP for the Auroral Multiscale Midex (AMM) Mission star tracker.

General information
State: Published
Organisations: Department of Automation
Number of pages: 63
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 175657
Publication: Research - peer-review › Report – Annual report year: 1999

RFP for the Comet Nuclei Tour (CONTOUR)

General information
State: Published
Organisations: Department of Automation
Number of pages: 64
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 175656
Publication: Research - peer-review › Report – Annual report year: 1999

RFP for the italien satellite AGILE.

General information
State: Published
Organisations: Department of Automation
Number of pages: 44
Publication date: 1999
Specification of the ASC to be used on the PRC satellite (HiTSAT).

General information
State: Published
Organisations: Department of Automation
Number of pages: 14
Publication date: 1999

Timestamp Test Report - Prepared for Champ Mission

General information
State: Published
Organisations: Department of Automation
Authors: Denver, T. (Intern)
Publication date: 1999

Timestamp Test Report - Prepared for Proba Mission

General information
State: Published
Organisations: Department of Automation
Authors: Denver, T. (Intern)
Publication date: 1999

Voltage, Temperature, Frequency Margin Test Report: Prepared for GRACE Project

General information
State: Published
Organisations: Department of Automation
Authors: Denver, T. (Intern)
Publication date: 1999
Motion Compensation Techniques for Aerospace

Department of Electrical Engineering
Period: 01/09/2001 → 29/08/2005
Number of participants: 5
Phd Student:
Denver, Troelz (Intern)
Main Supervisor:
Jørgensen, John Leif (Intern)
Examiner:
Brauer, Peter (Intern)
Birger, Niss (Ekstern)
Pickles, Andrew John (Ekstern)

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

Design and Implementation of a star trackers for the European SMART-1 mission to the Moon

The European Space Agency, ESA, is presently designing the small spacecraft SMART-1, which is bound for the Moon where its scientific objective is a study of radiometric and albedo properties of the Lunar surface. SMART-1 will, apart from several advanced instruments, also utilize a new propulsion system to change the orbit from the Geostationary Transfer Orbit into which it is inserted, to a low lunar orbit. Although this propulsion system has a very high specific impulse, the thrust is relatively low, resulting in a slow orbit transfer. This implies, that the spacecraft, and its systems, must be designed to survive substantial radiation in the Van Allen belts. IAU will design, verify and build the attitude sensors for SMART-1 such that proper operations will be maintained during the high radiation exposure, and such that high accuracy is ensured for the science instrumentation upon arrival at the lunar orbit.

Department of Automation
Swedish Space Corporation
Copenhagen Optical Company ApS
European Space Agency
Period: 22/12/1999 → …
Number of participants: 8
Project participant:
Betto, Maurizio (Intern)
Denver, Troelz (Intern)
Kilsgaard, Søren (Intern)
Guldager, Peter Buch (Intern)
Riis, Troels (Intern)
Thuesen, Gøsta (Intern)
Jørgensen, Finn E. (Intern)
Project Manager, organisational:
Jørgensen, John Leif (Intern)

Financing sources
Source: Unknown
Name of research programme: Ukendt
Amount: 3,593,118.00 Danish Kroner
Project
**Design and Review of STT for the SMILES and MAXI experiments**
The International Space Station (ISS) which is currently under construction, as a worldwide collaboration. The Japanese contribution, JEM carry, apart from pressurised module for astronauts, an exposed facility for four remote sensing and earth observation moduels. IAU is collaborating with NASA, the Japanese Space Agensy, on developing inertial reference instruments for two of these modules, namely the SMILES (Superconducting SubMillimeter Limb-Emission Sounder) and MAXI (Monitor of All-sky X-ray Image).

Department of Automation
The Japanese National Space Agency
Period: 22/12/1999 → …
Number of participants: 8
Project participant:
Betto, Maurizio (Intern)
Denver, Troelz (Intern)
Kilsgaard, Søren (Intern)
Guldager, Peter Buch (Intern)
Riis, Troels (Intern)
Thuesen, Gøsta (Intern)
Jørgensen, Finn E. (Intern)
Project Manager, organisational:
Jørgensen, John Leif (Intern)

**Financing sources**
Source: Unknown
Name of research programme: Ukendt
Amount: 719,750.00 Danish Kroner

**HITSAT**
The Chinese government is developing a crop and forest surveillance satellite. The Harbin institute of Technology is the prime contractor. Together with Dornier Satelliten Systeme GMBH, IAU is developing the image platform for the satellite.

Department of Automation
Dornier Satellitensysteme GmbH
Harbin Institute of Technology
Copenhagen Optical Company ApS
Period: 22/12/1999 → …
Number of participants: 8
Project participant:
Betto, Maurizio (Intern)
Denver, Troelz (Intern)
Kilsgaard, Søren (Intern)
Guldager, Peter Buch (Intern)
Riis, Troels (Intern)
Thuesen, Gøsta (Intern)
Jørgensen, Finn E. (Intern)
Project Manager, organisational:
Jørgensen, John Leif (Intern)

**Financing sources**
Source: Unknown
Name of research programme: Ukendt
Amount: 1,500,000.00 Danish Kroner

**Star Camera Assembly for the Gravity Recovery And Climate Experiment (GRACE) Project**
The National Aeronautics and Space Agency of USA, NASA, are working on formation flying capabilities for spacecrafts. The first mission to use this technology is the gravitometry mission GRACE. The two GRACE spacecrafts will fly in close
formation in low earth orbit, with a separation varying from 200 to 500 km. The spacecraft distance must be monitored with an accuracy of better than 1 micrometer/sec. IAU is together with the GRACE project at JPL developing the inter spacecraft attitude link which is a prerequisite for the mission objectives to be met.

Department of Automation
NASA Jet Propulsion Laboratory
Dornier Satellitensysteme GmbH
Copenhagen Optical Company ApS

**Development of ASC Star Sensors for the small-satellite mission PROBA**
The European space Agency, ESA have decided to develop a series of small satellites aimed at augmenting Europeean capabilities within the field of autonomy, robustness and the "better, faster and cheaper" production strategy. This spacecraft series has been dubbed "PROBA". IAU is, together with ESA, developing a star tracker capable of operatin in an entirely autonomous spacecraft environment. The Satellite prime contractor is Verhaert of Belgium with which IAU is developing the interface, and the control strategy.

Department of Automation
European Space Agency
Verhaert S.A
Copenhagen Optical Company ApS

**Financing sources**
Source: Unknown
Name of research programme: Ukendt
Amount: 2,463,654.00 Danish Kroner

**Project**
ADEOS2 satellite attitude reference instrument.
The ADEOS2 is a large satellite build under contract to the Japanese space agency NASDA. NASA/JPL has delivered a precision scatterometer, the SeaWind, that is to make precision mapping of surface wind patterns. The predecessor of this instrument flew on the NSCAT, detecting and monitoring e.g. the "El Nino" phenomenon. When NCAT ceased to operate, it was decided to upscope the ADEOS2/SeaWind with a precision attitude reference to enable a continued global monitoring. The Advanced Stellar Compass was selected to provide the attitude measurements.

Department of Automation
NASA Jet Propulsion Laboratory
The Japanese National Space Agency
Toshiba
Period: 09/06/1998 → …
Number of participants: 8
Project participant:
Betto, Maurizio (Intern)
Kilsgaard, Søren (Intern)
Korsbech, Uffe C C (Intern)
Guldager, Peter Buch (Intern)
Riis, Troels (Intern)
Thuesen, Gøsta (Intern)
Denver, Troelz (Intern)

Financing sources
Source: Unknown
Name of research programme: Ukedt
Amount: 1,500,000.00 Danish Kroner
Project

Advanced Stellar Compass For the SAC-C satellite
The international Geophysics potential decade, has been declared beginning with the launch of the Ørsted satellite. To support the effort of precise mapping of the Geomagnetic field, NASA, the Argentine and the Danish government decided to include a simplified version of the Ørsted instrumentation platform in the Argentine SAC-C satellite. The Space Instrumentation Group was contracted to develop an improved version of the Ørsted Star Imager for this mission.

Department of Automation
National Space Institute
Institute for Product Development
Department of Electrical Engineering
TERMA Elektronik A/S
CONAE Argentina
DDC-I A/S
Danmarks Meteorologisk Institut
NASA Jet Propulsion Laboratory
University of Copenhagen
INVAP Argentina
Period: 05/03/1998 → 01/01/19999
Number of participants: 8
Project participant:
Betto, Maurizio (Intern)
Kilsgaard, Søren (Intern)
Korsbech, Uffe C C (Intern)
Development of a Star Imager for the German mini satellite Champ

The German government research establishment "GeoForschungsZentrum" developed under a contract to the German government a microsatellite named "Champ". The Space Instrumentation Group was given a contract to modify the first generation Star Imager with one camera, to the new Star Imager which features two cameras. The flight instruments were delivered for integration in the fall of 1998. the Integration and Test phase will commence throughout 1999.

Department of Automation

Deutsches Geoforschungszentrum

Dornier GmbH

RST GMBH

NASA Jet Propulsion Laboratory

Jena Optronik GMBH

Period: 24/06/1996 → 31/12/2005

Number of participants: 7

Project participant:

Guldager, Peter Buch (Intern)

Thuesen, Gøsta (Intern)

Riis, Troels (Intern)

Kilsgaard, Søren (Intern)

Betto, Maurizio (Intern)

Denver, Troelz (Intern)

Project Manager, organisational:

Jørgensen, John Leif (Intern)

Financing sources

Source: Unknown

Name of research programme: Ukendt

Amount: 4,300,000.00 Danish Kroner

Source: Unknown

Name of research programme: Ukendt

Amount: 300,000.00 Danish Kroner

Project