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Foreword

The *First International Science Meeting* on the Swarm mission was held from 3-5 May 2006 in the beautiful city of Nantes in France. The programme covered scientific aspects and the current status of ESA's magnetic field mission Swarm. This meeting is the first in a series dedicated to the Swarm mission and its objectives. Swarm was selected for full implementation as the 5th mission in the European Space Agency's Earth Explorer Programme in May 2004. The opportunity mission Swarm, with lead proposers Eigil Friis-Christensen, Hermann Lühr and Gauthier Hulot, is scheduled to be launched in 2010. It will follow on the current Ørsted, CHAMP and SAC-C magnetic field satellite missions, which have already been providing continuous high-precision magnetic observations since 2000. Swarm will thus make it possible to complete more than a decade of magnetic observations within the context of the 'International Decade of Geopotential Research' and provide the best ever survey of the geomagnetic field and its temporal evolution.

It will lead to new insights into the Earth system by improving our understanding of the Earth's interior and its effect on geospace, the vast region around the Earth where electro-dynamic processes are influenced by the Earth's magnetic field. The mission will comprise a constellation of three satellites, with two spacecraft flying side-by-side at lower altitude (450 km initial altitude), thereby measuring the East-West gradient of the magnetic field, and the third one flying at higher altitude (530 km). High-precision and high-resolution measurements of the strength, direction and variation of the magnetic field, complemented by precise navigation, accelerometer and electric field measurements, will provide the necessary observations that are required to separate and model the various sources of the geomagnetic field. It will also allow an analysis of the Sun's influence within the Earth system. In addition practical applications in many different areas, such as space weather, radiation hazards, navigation and resource management, could benefit from the Swarm mission. More information on Swarm can be found at: [HTTP://WWW.ESA.INT/ESALP/LPSWARM.HTML](http://www.esa.int/esaLP/LPSwarm.html) .

The purpose of the meeting was to bring together scientists and students working in all fields of Geomagnetism or related fields, which could benefit from the Swarm mission. Scientists already involved in the previous Magsat, Ørsted, CHAMP, SAC-C and other related existing or planned missions were expected to contribute. The goals of the meeting were to offer opportunities for participants to:

1. receive the latest information about the mission concept, design and scientific goals,
2. build upon the successful series of OIST and CHAMP workshops, and to link to existing and/or planned missions,
3. give scientific presentations on topics related to all mission objectives, and
4. participate in workshops on future activities in connection with the preparation of the mission.

In total 118 participants from 15 different European countries, Canada, the United States, India and Japan participated in the meeting held at the University of Nantes. Travel grants were provided to a number of participants by ESA and NASA. From all submitted contributions, a meeting programme without parallel sessions was compiled with 39 oral and 49 poster presentations. These covered a wide range of scientific areas related to the objectives of the Swarm mission and beyond. On the last afternoon the participants split into two groups to follow dedicated workshops, which were organised in parallel, on *global models and data assimilation strategies* and on *Swarm in space physics*. The first was moderated by Gary Egbert (Oregon State University, USA), Stefan Maus (NOAA/NGDC and CIRES, USA), and Terry Sabaka (NASA GSFC, USA), the second by Susanne Vennerstrøm (Danish Space Center, Denmark), Therese Moretto Jorgensen (National Science Foundation, USA), David Knudsen (University of Calgary, Canada), and Hermann Lühr (GeoForschungsZentrum, Germany). All submitted (non-peer reviewed) contributions are published by ESA in these proceedings either in the form of papers or as presentations or posters, leaving the responsibility of the contents to the authors.





The participants of the *First International Science Meeting* (CLICK FOR FULL-SIZE IMAGE).

The meeting was very well organised at the University of Nantes, which certainly encouraged everyone to actively participate and contributed to the successful outcome of it. I would like to thank the local organizing committee lead by Benoit Langlais and Gauthier Hulot and the people from LPGN, headed by Christophe Sotin, for their commitment in organizing this meeting. I would like to express my gratitude to the scientific committee for creating an interesting and inspiring programme, and also to the chairs of the sessions and the moderators of the workshops for guiding us through the programme and for leading the discussions. The participants highly appreciated the very nice welcome reception and enjoyed the speech by mr. Yannick Guin, representing the city of Nantes. It was organized at 'Museum d'Histoire Naturelle de Nantes' and offered access to the Mars exhibit that was jointly organised by the museum and the LPGN. The success of the meeting also depended to a great extent on the financial sponsorship. We therefore gratefully acknowledge the financial contributions of all sponsors. A special, highly appreciated contribution came from Charles Barton, the current president of the International Association of Geomagnetism and Aeronomy, who provided a cartoon of the Swarm mission that was introduced at the end of the meeting. Last but not least I would like to thank all participants for their professional, constructive and enthusiastic participation in the meeting which made this meeting a memorable one.

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**Swarm mission (Courtesy: Charles Barton)
(CLICK FOR FULL SIZE IMAGE)**

Table of Contents

- I. SESSION 1 – INTRODUCING THE SWARM MISSION**

- II. SESSION 2 –INTERNATIONAL CONTEXT AND THE INTERNATIONAL DECADE OF GEOPOTENTIAL RESEARCH**

- III. SESSION 3 – CORE AND LITHOSPHERIC STUDIES**

- IV. SESSION 4 – MAGNETOSPHERIC AND IONOSPHERIC STUDIES**

- V. SESSION 5 – THERMOSPHERIC, GRAVITY, INDUCTION AND OCEAN STUDIES**

- VI. POSTER PROGRAMME**

- VII. CONCLUDING SESSION: SUMMARY OF WORKSHOPS AND RECOMMENDATIONS**

- VIII. LIST OF PARTICIPANTS**

- IX. CONFERENCE PHOTOS**

I. Session 1 – Introducing the Swarm mission

1. Introduction, goals of the meeting (R. Haagmans)
[INVITED PRESENTATION]
2. Scientific goals of Swarm (E. Friis-Christensen)
[INVITED PAPER]
3. Swarm mission concept (Y. Menard, R. Bock, E. Neri and R. Haagmans)
[INVITED PRESENTATION]

II. Session 2 - International context and the International Decade of Geopotential Research

4. Multi-point observations with the four Cluster satellites (C. P. Escoubet, H. Laakso, H. Opgenoorth and M. Taylor)
5. Ionosphere-magnetosphere-thermosphere science in Canada and opportunities for Swarm (D. Knudsen)
[PAPER / PRESENTATION]
6. Future satellites with in situ probes to address critical space weather and scientific measurement requirements in the Earth's ionosphere/thermosphere (J.M. Grebowsky, R.F. Pfaff, Jr., and N.J. Fox)
[PRESENTATION]
7. From ships to satellites: constraining geomagnetic secular variation (A. Jackson)
[INVITED PRESENTATION]
8. Improvements of geomagnetic field models made during the first years of the international 'decade' (N. Olsen)
[INVITED PRESENTATION]
9. Characterizing and understanding core field dynamics: lessons from MAGSAT, Ørsted, CHAMP, SAC-C, and the Decade (G. Hulot)
[INVITED PRESENTATION]
10. Lithospheric magnetic fields: accomplishments of the decade of geopotential research (M.E. Purucker)
[INVITED PAPER]
11. Recent achievements in characterizing the magnetosphere, ionosphere and thermosphere (H. Lühr, S. Maus, C. Stolle, H. Liu and M. Rother)
[INVITED PAPER / PRESENTATION]
12. Space-borne gravimetry: progress, outlook and relevance for Swarm (P.N.A.M. Visser)
[INVITED PAPER / PRESENTATION]

III. Session 3 - Core and lithospheric studies

13. Field models from CHAMP data: the main field model POMME-3 and the lithospheric field model MF4 (S. Maus, M. Rother, and H. Lühr)
[PRESENTATION]
14. Implementing time-dependent maximum entropy regularization (N. Gillet, A. Jackson and C. C. Finlay)
[PRESENTATION]
15. Magnetic diffusion patches at the top of the Earth's core (A. Chulliat, N. Olsen, and T. Sabaka)
[PRESENTATION]
16. On dynamical models of the secular variation of the Earth's magnetic field (D. Jault)
[INVITED PAPER]
17. Constraining numerical geodynamo with surface observations: a geomagnetic data assimilation approach (W. Kuang and A. Tangborn)
[PAPER / PRESENTATION]
18. Fall in Earth's dipole moment is intermittent (D. Gubbins, C. Finlay and A. Jones)
[PRESENTATION]
19. High resolution lithospheric field recovery using gradient data within a CM framework as applied to the Swarm mission simulation (T.J. Sabaka, N. Olsen, and L.R. Gaya-Pique)
[PRESENTATION]
20. Derivation of local crustal magnetizations using multiple altitude magnetic data (Y. Quesnel, B. Langlais and C. Sotin)
[PAPER / PRESENTATION]
21. Magnetic contributions of minerals at the surface and at depth in the crust: comparing anomaly maps from aeromagnetic and satellite data from Scandinavia (S.A. McEnroe, K. Hemant and J.R. Skilbrei)
[PAPER]
22. Heat flux over Indian subcontinent from satellite and aeromagnetic data (M. Rajaram and S.P. Anand)
[PRESENTATION]

IV. Session 4 - Magnetospheric and ionospheric studies

23. Magnetospheric science with the Swarm mission (M. Hesse)
[INVITED PRESENTATION / AVI MOVIE]
24. Present and potential global M-I state specification with Iridium (B.J. Anderson and N.J. Fox)
[PRESENTATION]
25. Field-aligned currents in the Earth's magnetosphere (A. Marchaudon)
[INVITED PRESENTATION]

26. MIRACLE and CHAMP: some results; MIRACLE and Swarm: some opportunities (O. Amm, L. Juusola, A. Viljanen and K. Kauristie)
[PAPER / PRESENTATION]
27. Electrodynamic parameters of the auroral oval from combined spacecraft and ground measurements (M. Connors)
[PAPER]
28. Incoherent scatter radar observations of the cusp ionosphere (S.C. Buchert, Y. Ogawa, E. Yordanova, J.-E. Wahlund)
[PAPER]
29. Transpolar ionospheric currents derived from Ørsted and from ground (P. Stauning, J. Watermann and O. Troshichev)
[PAPER]
30. Low latitude ionospheric studies using satellite magnetic data (A. Bhattacharyya)
[INVITED PAPER / PRESENTATION]
31. Low-latitude magnetic disturbances caused by field-aligned currents connected to the polar region (S. Vennerstrøm, F. Christiansen, T. Moretto and N. Olsen)
[PRESENTATION]

V. Session 5 - Thermospheric, gravity, induction and oceanic studies

32. Low latitude ionosphere - thermosphere coupling (S. Watanabe) [invited]
33. Thermospheric preconditioning of the ionosphere (A.L. Aruliah, E.M. Griffin, A. Dobbin, A.D. Aylward and C.J. Davis)
[PRESENTATION]
34. Numerical modeling of the storm-time ionospheric currents and electric fields (N. Maruyama, T.J. Fuller-Rowell, M.V. Codrescu, D.N. Anderson, A.D. Richmond, S. Sazykin, F. Toffoletto, R.W. Spiro and G. Millward)
35. Swarm and gravity: possibilities and expectations for gravity field recovery (C. Gerlach and P.N.A.M. Visser)
[PAPER / PRESENTATION]
36. Satellite induction studies based on spatiotemporal analysis of low-earth orbit magnetometer data (M.E. Everett)
[PAPER]
37. A 1-D mantle conductivity derived from CHAMP, Ørsted, and SAC-C magnetic data (A. Kuvshinov and N. Olsen)
[PAPER]
38. Can geomagnetic satellite measurements be used to monitor ocean flows? (F. Vivier, R.H. Tyler and E. Maier-Reimer)
[INVITED PRESENTATION]

39. Magnetic fields generated by the Indian Ocean tsunami (C. Manoj, S. Neetu and A. Kuvshinov)
[PAPER]

VI. Poster Programme

40. The LETI/CNES absolute scalar magnetometers for Swarm (I. Fratter, J.C. Lalaurie, F. Bertrand and J.M. Leger)

41. The Canadian electric field instruments on Swarm (D.J. Knudsen and the CEFI Team)
[POSTER]

42. The ST-5 magnetic field constellation: first results (G. Le, J. Slavin, T. Sabaka and M. Purucker)
[PAPER]

43. SPDF multi-mission data and modeling services in the Swarm Era (R. McGuire and D. Bilitza)

44. The Living With a Star geospace mission (N.J. Fox, D.G. Sibeck, B.H. Mauk, J.M. Grebowsky, L. Zanetti and J. H. Yee)

45. Wavelet-based selection of satellite data for geomagnetic field modeling (R. Schachtschneider, G. Balasis, M. Rother and M. Manda)

46. A method to refine main field modeling (I. Wardinski and R. Holme)
[PAPER]

47. Maximum entropy magnetic field modeling (E.T. Horncastle, R. Holme and G. Hulot)
[POSTER]

48. Extending the historical field model gufm1 from 1990 to 2005 (C.C. Finlay, A. Jackson and N. Gillet)
[POSTER]

49. Reducing the Backus effect using Backus' constraints (A. Chulliat, N. Olsen and T. Sabaka)
[POSTER]

50. Geomagnetic data assimilation with MoSST core model (Z. Sun, A. Tangborn, W. Kuang and W. Jiang)
[POSTER]

51. The importance of satellite magnetic data to improve our confidence in a possible reversal or excursion of the present geomagnetic field (A. De Santis)
[POSTER]

52. Evidence for a geomagnetic jerk after 2003 in LOD (R. Holme and O. de Viron)
[PAPER / POSTER]

53. Mantle conductivity and geomagnetic jerks (K. Pinheiro and A. Jackson)
[POSTER]

54. A new global magnetization model: validation and science results (M. Purucker)
[PAPER]

55. A global crustal field model from combined Ørsted and CHAMP satellite data (model BGS/G/L/0406) (A. W. P. Thomson and V. Lesur)
[POSTER]

56. A global lithospheric magnetic field model with reduced noise level in the polar regions ([V. Lesur](#) and [S. Maus](#))
[POSTER]
57. Antarctic lithospheric magnetic anomalies from ADMAP, CHAMP and Ørsted data ([H.R. Kim](#), [P.T. Taylor](#), [R.R.B. von Frese](#), [A.V. Golynsky](#) and [L.R. Gaya-Pique](#))
58. A geomagnetic reference model for Albania, South-East Italy and the Ionian Sea from 1990 to 2005 with prediction to 2008 ([E. Qamili](#), [A. De Santis](#), [B. Duka](#) and [G. Dominici](#))
[PAPER]
59. Evaluating spherical Earth magnetic gradients from Swarm by Gauss-Legendre quadrature integration ([M.F. Asgharzadeh](#), [R.R.B. von Frese](#) and [H.R. Kim](#))
[POSTER]
60. Contribution of regional modeling techniques to the Swarm mission ([E. Thebault](#) and [M. Manda](#))
[PAPER]
61. An investigation of the form of the magnetospheric field from the Tsyganenko 2001 magnetic field model ([E.E. Woodfield](#) and [R. Holme](#))
[PAPER / POSTER]
62. A statistical comparison of Cluster magnetic data with the Tsyganenko 2001 model ([E.E. Woodfield](#), [M. Dunlop](#), [R. Holme](#), [J.A. Davies](#) and [M.A. Hapgood](#))
[PAPER / POSTER]
63. Plasma modifications in the regions of field-aligned currents: Demeter observations ([E. Seran](#), [J.-J. Berthelier](#) and [H. Frey](#))
64. a. Geomagnetic field current state determination by satellite magnetic measurements ([S.V. Filippov](#), [A.E. Levitin](#), [L.A. Dremukhina](#) and [M.A. Ivanova](#))
[PAPER / POSTER]
64. b. The calculation of the topology of deep magnetic inhomogeneous of the Earth's mantle from MAGSAT, CHAMP geomagnetic satellite deep-sounding methods ([A.L. Kharitonov](#), [G.A. Fonarev](#), [S.A. Serkerov](#), [G.S. Hassan](#) and [G.P. Kharitonova](#))
[PAPER]
64. c. Some projects proposed by geomagnetic departments of Izmiran that may use Swarm data ([A. Levitin](#), [L. Dremukhina](#), [L. Gromova](#), [V. Golovkov](#), [T. Zvereva](#), [T. Bondar](#), [A. Orlova](#), [A. Zaitzev](#), [S. Filippov](#))
[PAPER]
65. Polar ionospheric current systems: comparing global MHD simulation results with observations from Ørsted and CHAMP ([T. Moretto](#), [S. Vennerstrøm](#), [N. Olsen](#), [L. Rastätter](#), [J. Raeder](#))
66. Field-aligned and ionospheric currents inferred from temporally and spatially coincident Ørsted satellite, ground-based magnetometer and sondrestrom ISR measurements ([J. Watermann](#), [P. Stauning](#), [F. Christiansen](#) and [J.P. Thayer](#))
[PAPER]
67. Field-aligned and ionospheric currents and convection electric fields in the polar ionosphere ([S. Vennerstrøm](#), [T. Moretto](#) and [N. Olsen](#))
[PAPER]
68. Electrodynamics of field-aligned currents in the magnetosphere-ionosphere system ([J.C. Cerisier](#), [E. Seran](#) and [A. Marchaudon](#))
69. Geomagnetic field modeling of ULF waves and field aligned currents ([R. Rankin](#), [K. Kabin](#) and [R. Marchand](#))
70. Sources of high latitude geomagnetic fields in the Earth's ionosphere and magnetosphere ([J.C. Samson](#))

71. Curl-B technique applied to Swarm constellation for determining field-aligned currents ([P. Ritter](#) and [H. Lühr](#))
[PAPER / POSTER]
72. Storm time observations of plasma and waves in equatorial plasma depletions ([J.J. Berthelier](#), [M. Malingre](#), [R. Pfaff](#), [J.P. Lebreton](#), [E. Seran](#), [M. Parrot](#), [R. Potelette](#) and [J. Jasperse](#))
73. A global gravity-driven electric current system identified in CHAMP satellite magnetic measurements ([S. Maus](#) and [H. Lühr](#))
[POSTER]
74. GPS-assisted 3-dimensional ionospheric current modeling ([C.A. Raymond](#), [X. Pi](#), [G. A. Hajj](#), [A. J. Mannucci](#) and [T. Sabaka](#))
75. A layman looks at currents in the ionosphere ([F.J. Lowes](#))
[PAPER / POSTER]
76. An equatorial magnetic network during the Swarm mission ([Y. Cohen](#), [V. Doumbia](#) and [S. Dembele](#))
77. Validation of a global ionosphere-thermosphere model with CHAMP mass density data ([A.J. Ridley](#))
78. An attempt to model storm-time changes in upper thermospheric mass density with NRLMSISE-00 and CHAMP air drag data ([S.Y. Ma](#), [H. Lühr](#), [Y.L. Zhou](#), [L. Cai](#), [H. Wang](#) and [C. Reigber](#))
[PAPER]
79. CHAMP and TIE-GCM magnetic perturbation comparisons ([D.T. Mozzoni](#), [M. Manda](#) and [J.C. Cain](#))
[PAPER / POSTER]
80. The TIGRIS investigation ([P. Kintner](#), [S. Mende](#) and [R. McCoy](#))
81. Advantages of in situ data when estimating the global neutral atmospheric density using a data assimilation system ([C.F. Minter](#), [T.J. Fuller-Rowell](#) and [M.V. Codrescu](#))
[PAPER / POSTER]
82. Solar cycle variations of topside electron temperature and density ([V. Truhlik](#), [D. Bilitza](#), [P. Richards](#) and [L. Triskova](#))
83. Quasi-P10 electromagnetic response estimates from Ørsted vector data: a study in ring current asymmetry ([N.C. Richmond](#), [C. Constable](#), [S. Constable](#) and [J. Ribaud](#))
[PAPER / POSTER]
84. Empirical orthogonal function analysis of magnetic observatory data: further evidence for non-axisymmetric magnetospheric sources for satellite induction studies ([G. Balasis](#) and [G.D. Egbert](#))
[PAPER]
85. Electrical conductivity in the Earth's mantle: combined inversion of surface and CHAMP observations ([J. Velínský](#) and [Z. Martinec](#))
[POSTER]
86. Tri-dimensional inversion of satellite magnetic data for induction studies ([P. Tarits](#))
[PAPER / POSTER]
87. Multi-taper response estimation for satellite induction studies ([C.G. Constable](#))

[PAPER]

88. Applying satellite geomagnetism to probe ocean flow (J. Hawe and R. Holme)

[POSTER]

89. Swarm level 1b products (L. Tøffner-Clausen)

[PAPER]

VII. Concluding session: summary of workshops and future activities

90. Report on the Workshop “Swarm in Space Physics”, 5 May 2006 at the 1st Swarm International Science Meeting, Nantes (D. J. Knudsen, S. Vennerstrøm, T. Moretto, H. Lühr)

[PAPER]

91. Swarm science: a magnetospheric physics perspective (W.W. Liu, D.J. Knudsen and E.F. Donovan)

[PAPER]

92. Report on the Workshop “Global models and data assimilation strategies”, 5 May 2006 at the 1st Swarm International Science Meeting, Nantes (S. Maus, G. Hulot, G. Egbert, and T. Sabaka)

[PAPER]

93. Overview of global models relevant to geomagnetism (S. Maus)

[PRESENTATION]

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IX. CONFERENCE PHOTOS

The kind provision of photos from the meeting by Alain Cossard, Benoit Langlais, Mioara Manda, and Peter Stauning is greatly acknowledged. Making the Swarm cartoon available to the community by Charles Barton is highly appreciated. All can be viewed in the photo album ([CLICK HERE](#))