



General Information

Four years after the launch of the CHAMP satellite and more than two years after successfully placing the GRACE satellite pair into orbit a first joint meeting of the CHAMP and GRACE Science Teams was held on July 6-8, 2004 at the GeoForschungsZentrum Potsdam (GFZ).

The meeting stimulated a broad discussion within the international science community on the exploitation and application of the gravimetric, magnetic and atmospheric data products from these highly innovative geodetic missions in low altitude orbits. It also demonstrated the CHAMP/GRACE mission data potential for Earth system science studies when being used in combination with data from complementary remote sensing missions, aircrafts and ground instrumentation.

Conference proceedings will be published in [Advances in Geosciences](#), a journal of the European Geosciences Union, for details go to [Proceedings](#).

For the Scientific Organizers:

Christoph Reigber
Byron Tapley



Atmosphere/Ionosphere (AI)

Session Overview

	Talks			Posters
AI 1: Neutral Atmosphere	Part I	1 - 3	Thur, Jul 8, 09:00-10:00	P 1 – P 7 Thur, Jul 8, 15:30-16:30 P 8 – P 13
	Part II	4 - 7	Thur, Jul 8, 10:30-11:30	
AI 2: Ionosphere/Thermosphere	Part I	8 - 10	Thur, Jul 8, 12:00-13:00	
	Part II	11- 15	Thur, Jul 8, 14:00-15:15	

AI 1: Neutral Atmosphere, Part I	Thur, Jul 8, 9:00 – 10:00
<u>Chair:</u> Kent Lauritsen	

1.	Three years of space based atmosphere sounding with CHAMP: Results, highlights and future prospects (30 min)	J. Wickert, T. Schmidt, G. Beyerle, Ch. Reigber, L. Grunwaldt, R. König, R. Galas, S. Heise, and M. Ramatschi
2.	Radio Occultation Based Climatologies: Status of the CHAMPCLIM Project and First Results from the Summer Season 2003	A. Gobiet, U. Foelsche, A.K. Steiner, M. Borsche, T. Schmidt, A. Löscher, G. Kirchengast, and J. Wickert
3.	Connections of the parameters of gravity waves with amplitude and phase variations of the CHAMP radio occultation signal	A.G. Pavelyev, J. Wickert, Y.A. Liou, V.N. Gubenko

AI 1: Neutral Atmosphere, Part II	Thur, Jul 8, 10:30 – 11:30
<u>Chair:</u> Andreas Gobiet	

4.	Correction technique for Radio Occultation data with the use of regional meteorological models	V. Kunitsyn, V. Zakharov, K. Dethloff, R. Neuber, A. Rinke, I. Hebestadt
5.	Excess-Doppler prediction technique for the open-loop signal tracking of the Lagrange Radio Occultation GPS receiver: performance validation through comparisons with Champ observations	R. Notarpietro, A. Zin, M. Gabella, G. Perona
6.	An analysis of the negative refractivity bias detected in GPS radio occultation data: Results from simulation studies, aerological soundings and CHAMP observations	G. Beyerle, G. Koenig-Langlo, J. Wickert, T. Schmidt, S. Heise and J. Kaschenz
7.	Atmospheric densities derived from CHAMP/STAR: An overview	Sean Bruinsma

AI 2: Ionosphere/Thermosphere, Part I	Thur, Jul 8, 12:00 - 13:00
<u>Chair:</u> Peter Stauning	

8.	Ionospheric sounding by means of GPS measurements onboard CHAMP (30 min)	N. Jakowski, S. Heise, A. Wehrenpfennig, K. Tsybulya, S.M. Stankov, V. Wilken, Ch. Reigber, and H. Lühr
9.	Similarity of the amplitude variations in CHAMP radio occultation signal and Earth-based observations of the radio waves scintillations	A.G. Pavelyev, J. Wickert, C. Reigber, T. Schmidt, Y.A. Liou, K. Igarashi, D.A. Pavelyev
10.	Medium- and Small-Scale Ionospheric Irregularities Detected by CHAMP Radiooccultation Measurements	K. Tsybulya and N. Jakowski

AI 2: Ionosphere/Thermosphere, Part II	Thur, Jul 8, 14:00 - 15:15
<u>Chair:</u> Alexander Pavelyev	

11.	Search for Earthquake signatures in the ionosphere by ground and space based GPS measurements	N. Jakowski, V. Wilken, and K. Tsybulya
12.	Global Thermosphere Density Response During the Solar Storms of 2002 and 2003 from CHAMP Accelerometer Measurements	R. S. Nerem, J. M. Forbes, E. K. Sutton, and S. Bruinsma
13.	High-Latitude Thermospheric Neutral Density Variations Observed by the STAR Accelerometer on CHAMP	V. K. Henize, H. Lühr, and W. Köhler
14.	IMF By-related Cusp currents on different scales	P. Stauning and J. Watermann
15.	Evidence for night-time signal in observatory data related to solar wind sector structure and investigation of coupling mechanism	S. Macmillan, V. Lesur and A. Thomson

AI 1: Neutral Atmosphere - Poster	Thur, Jul 8, 15:30 - 16:30
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P 1	Cross-Validation of MIPAS/ENVISAT and GPS-RO/CHAMP Temperatures	Ding-Yi Wang for IMK-IAA MIPAS group and Jens Wickert for GFZ GPS/CHAMP Group
P 2	Inversion of Radio Occultations with Noise	Michael E. Gorbunov and Kent B. Lauritsen
P 3	Monitoring of CHAMP data with the 3dvar system of DWD	M. Tomassini, M. Gorbunov, L. Komblueh, A. Rhodin
P 4	Error levels in atmospheric surface pressure analysis fields	David Salstein and Rui M. Ponte
P 5	Validation of CHAMP and SAC-C Occultation Profiles	Shengjie Ge, C. K. Shum
P 6	Derivation of Vertical Water Vapor Profiles from GPS Radio Occultation with CHAMP	S. Heise, J. Wickert, G. Beyerle, T. Schmidt, J. Kaschenz, S.B. Healy, and Ch. Reigber
P 7	GPS radio occultation with CHAMP: An application for climate research	T. Schmidt, J. Wickert, G. Beyerle, Ch. Reigber



8. Ionospheric sounding by means of GPS measurements onboard CHAMP

N. Jakowski¹, S. Heise², A. Wehrenpfennig³, K. Tsybulya¹, S.M. Stankov¹, V. Wilken¹,
Ch. Reigber², and H. Lühr²

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The GPS radio occultation measurements of the ionosphere have been performed onboard CHAMP since 11 April 2001. More than 115000 vertical electron density profiles have been derived so far by a model assisted retrieval technique. The talk reviews the main results obtained by analyzing the ionospheric radio occultation (IRO) measurements including validation and modeling.

The talk addresses also the use of the GPS navigation measurements onboard CHAMP. These 0.1 Hz sampled data may effectively be used to reconstruct the three-dimensional electron density distribution of the topside ionosphere and plasmasphere.

Thus, significant structures can be analyzed in the vicinity of the CHAMP orbit plane averaged over the revolution period of 93 minutes.

Presented also are perturbation events derived from both ground and CHAMP based GPS measurements. From this aspect, a more comprehensive view on the ionospheric perturbation mechanisms is achieved.