Geophysical Research Abstracts
Vol. 12, EGU2010-5423, 2010
EGU General Assembly 2010

Lithospheric field recovery from CHAMP satellite magnetic measurements

Stefan Maus (1,2) and Hermann Lühr (3)

(1) CIRES, University of Colorado, Boulder, USA (stefan.maus@noaa.gov), (2) NOAA, NGDC, Boulder, United States (stefan.maus@noaa.gov), (3) GFZ, Potsdam, Germany (hluehr@gfz-potsdam.de)

Satellites in low-Earth orbit (LEO) provide the most effective means of mapping the long wavelengths of the magnetic field caused by the magnetization of the Earth's lithosphere. Initial satellite magnetic anomaly maps were produced in the 1970s from POGO satellite measurements and in the 1980s from Magsat, the first satellite to carry a science-quality vector magnetometer with accurate attitude determination. However, the Magsat mission lasted only for half a year and this during magnetically-disturbed solar maximum conditions. The CHAMP satellite (launched in July 2000) has provided an exceptional data basis for lithospheric field mapping. Salient features of CHAMP are (1) an order of magnitude improvement in magnetometer accuracy, (2) the long mission lifetime at low orbital altitudes leading to excellent spatial and temporal data coverage, (3) the high orbital inclination of 87.3° which minimizes the polar gap, and (4) the lucky coincidence that the lowest altitudes before re-entry coincide with the quietest period of the solar cycle. Here, we will characterize the spatial information content of the CHAMP data, discuss lithospheric field modeling approaches and present the resulting field models.