

MA 34 Invited Talk Mioara Mandea

Time: Friday 10:15–10:45

Room: HSZ 03

Invited Talk

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The Earths magnetic field during the new satellite era —
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Due to the instability of its generating process, the geodynamo, reversals of the predominant dipolar magnetic field component, as well as relatively short periods of very weak total fields occur at irregular intervals. Currently, the geomagnetic field strength decreases quite rapidly, with certain regional areas where a drop of 20% over the last 40 years has been detected. The dipolar part has dropped by more than 10% within the past 150 years. This is an order of magnitude faster than its natural decay time, a reflection of the growth of patches of reverse flux at the core-mantle boundary. Moreover, the velocity of the north magnetic pole has reached some 40 km/year in 2001, the highest velocity measured so far over the 20th and 21st centuries. Recently, important changes in the field have been documented in the South Atlantic region, where the expanding South Atlantic Anomaly has serious implications for low-Earth orbit satellite operations. In order to understand this recent behaviour of the Earths magnetic field, new high-quality measurements are needed. Likely, three new magnetic satellites have recently been launched in low-Earth orbits: Oersted, CHAMP and SAC-C. The high quality data provided by these satellites has allowed to generate field and secular variation models of much higher resolution than previously possible. An overview of the new results of the Earth's magnetic field measurements from space will be given, including the first order spatial and temporal characteristics, and interpretations, from the lithospheric structure to the core flow. A list of problems will be discussed, while satellite experiments to address these challenges will be presented.