

Séminaire IPGS le 20 Juin à 13h45

Intervenant : Dr. Ingo Wardinski,

Laboratoire de Planétologie et Géodynamique (UMR 6112), Université de Nantes

Titre : Models of Earth's magnetic field and their application to deep Earth studies.

Abstract :

Observations of the Earth's magnetic field taken at the Earth's surface and at satellite altitude have been combined to construct models of the geomagnetic field and its variation. More recently, we have developed a method for constructing core field models that satisfy the frozen-flux constraint.

As a consequence, the observed geomagnetic field evolution is entirely due to advection of the magnetic field in the liquid outer core. The approach proved to maintain the spatial complexity of the field morphology backward in time. This is of particular interest, as geomagnetic field observations are becoming sparse further back in time, and therefore may provide some control on historical field changes.

One major question arises: Can such approach be used to determine future Earth's magnetic field variation?

We seek to answer this question by modelling the temporal variability of the motion within the liquid outer core by stochastic models.

Moreover, as a spin-off from geomagnetic field modelling, we obtain also estimates of dynamical processes that contribute to transient features observed in Earth's rotation.

Analyses of these features provide an unique insight to interactions between Earth's core and mantle, and may hold some implications for deep-mantle dynamics.