

Surprisingly rapid changes in the Earth's core discovered

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In a recent paper published in *Nature Geoscience*, the geophysicist Mioara MANDEA from the GFZ German Research Centre for Geosciences, Potsdam and her Danish colleague Nils OLSEN from the National Space Institute/DTU Copenhagen, have shown that motions in the fluid in the Earth's core are changing surprisingly fast, and that this, in turn, effects the magnetic field of our Planet.

The very precise measurements of the Earth's magnetic field delivered by the geosatellite CHAMP combined with Ørsted satellite data and ground observations over the past nine years, have made it possible to reveal what is happening at 3000 km under our feet.

Indeed, for the first time, Nils Olsen and Mioara Mandea have computed a model for the flow at the top of the Earth's core that fits with the recent rapid changes in the magnetic field, and is also in agreement with the changes in the Length-of-Day variation.

This core flow is rather localized in space, and involves rapid variations, almost sudden, over only a few months – a remarkably short time interval compared with the respectable age of our Planet or even with the time of the last magnetic field reversal, some 780000 years ago.

Scientists from the Helmholtz Centre GFZ and other institutions are currently involved in the ESA Swarm mission, which will follow on the CHAMP achievements. The Swarm constellation consists of three CHAMP-type satellites, which will measure the Earth's magnetic field



even more accurately than before.

Citation: Rapidly changing flows in the Earth's core, Nils OLSEN and Mioara MANDEA, *Nature Geoscience* 1, 390 - 394 (18 May 2008), doi: 10.1038/ngeo203

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