



## **Observation of magnetic diffusive processes and secular acceleration pulses at the core surface**

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Recent observational studies based upon satellite data have shown that magnetic diffusive processes are detectable at the core surface over only a few decades. Magnetic flux is being expelled from the core below the South Atlantic Anomaly, where at least two reversed flux patches have been growing for several decades, and below the North polar region, where a small reversed flux patch has emerged in the 1990s, contributing to the acceleration of the North magnetic pole over the same time interval. High-precision satellite data from the Oersted and CHAMP satellites have also been used to calculate time varying, high-resolution spherical harmonics models of the magnetic field at the core surface over the last ten years. Such models make it possible for the first time to investigate the time variations of the secular acceleration, i.e. the second order time derivative of the radial magnetic field. A pulse in the secular acceleration, centered near 2005, was shown to be at the origin of the 2003 and 2007 geomagnetic jerks, defined as sudden changes in the field second derivative at the Earth's surface. This presentation will review recent observations of magnetic diffusive processes and secular acceleration pulses at the core surface and discuss possible interpretations of these phenomena.