Observational Constraints on the Dynamics of the Outer Core

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S3: Outer Core - Observations of Structure & Composition

Invited Talk

Observational Constraints on the Dynamics of the Outer Core

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This review talk will focus on recent advances in the use of magnetic observations to probe the dynamics of the Earth's outer core. A brief introduction will be given to sources of the Earth's magnetic field, and how these may be observed on various time scales. Use of the magnetic induction equation to infer core motions from magnetic observations will briefly be described. Examples of recent studies using magnetic observations to provide insights into the core and the geodynamo will be presented. These will include reconstructions of the core surface field during the past 10,000 years, results from new ensemble inversion methods applied to the observatory era, and what has been learnt concerning rapid changes in the core from the past decade of continuous, high resolution, satellite observations. Future prospects, outstanding observational challenges, and the opportunities presented by ESA's upcoming Swarm satellite constellation will also be discussed.