

A pilot study of geomagnetic data assimilation into a geodynamo model

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Geomagnetic secular variation is a long-term variation of the Earth's magnetic field. The magnetic field of the Earth is originated from a dynamo in the outer core. Modeling of geodynamo process is thus a straightforward approach for predicting geomagnetic secular variations. However, it is intrinsically difficult to resolve the current state of the geodynamo from observable magnetic field and to predict future evolution of geodynamo. We are developing a framework for estimating the current state of the geodynamo by using a data assimilation approach. As a preliminary study, we performed data assimilation experiments using synthetic geomagnetic data in order to evaluate if data assimilation methods are effective for estimating the state of the geodynamo. Some data assimilation schemes based on ensemble-based variational method were applied and compared. Preliminary results of the experiments will be demonstrated.

Keywords: ensemble-based data assimilation, geodynamo model, secular variation