

Magnetic field morphology affected by a stably stratified layer below the core mantle boundary

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A stably stratified layer below the core-mantle boundary (CMB) has been detected by seismic and geomagnetic field observations. Chemically or thermally stable stratification is suggested as its origin (Helffrich and Kaneshima, 2010; Buffett and Seagle, 2010; Pozzo et al. 2012; Ohta et al. 2016).

In the core, the geomagnetic field is maintained by thermally and chemically driven flows via dynamo action. Assuming the eddy diffusion in the core, the co-density has been used in dynamo modeling. However, the origin of stable stratification cannot be distinguished with the co-density approach. Hence, thermal and compositional convection must be treated separately. In this study effects of a stable layer of either origin below the CMB are examined, adopting thermochemical double diffusive convection. One of the remarkable results is the effect of a stably stratified layer on the morphology of the dynamo-generated magnetic field, that is discussed in this presentation.