

## On a possibility to detect a stratified layer at the core surface from the geomagnetic field

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Recent seismic studies suggest that there may exist a stably stratified layer at the top of the Earth's outer core. This means that upwelling and downwelling flows should not exist just below the core-mantle boundary. Fluid motion at the core surface can be derived from the spatial distribution and secular variation of the geomagnetic field observed at the Earth's surface. Most of core flow models are estimated on the basis of the frozen-flux hypothesis, where the magnetic diffusion term is neglected in the induction equation.

We have developed a new method to estimate the core surface flow; that is, we take into account the magnetic diffusion inside the boundary layer at the core surface, while we neglect the magnetic diffusion below the boundary layer as in the frozen-flux approximation. In the method, the thickness of the boundary layer is one of parameters. This indicates that it might be possible to examine the existence of upwelling and downwelling just below the core-mantle boundary. Hence we attempt to detect a stratified layer at the top of the core using such parameterization.