

コア-マントル熱的結合に着目した地球コアのエナジェティックスとダイナミクス

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Energetic and dynamics of Earth's core as a consequence of core-mantle thermal coupling

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The mantle convection strongly affects both evolution and dynamics of Earth's core. On the thermal evolution of Earth's core, the onset time of the inner core growth is strongly influenced by the heat flux across the core-mantle boundary (CMB) as well as the magnetic dissipation. On the core dynamics, the magnetic field generation by dynamo actions strongly affects the heat flux heterogeneity at the CMB. However, in most dynamo models, the heat flux heterogeneity at the CMB is approximated as a linear function of the seismic anomalies. This treatment is not appropriate from numerical mantle convection simulations because the non-linear effects are caused by the post-perovskite phase transition and compositional anomalies. Here two topics on the thermal-coupling between core and mantle are introduced, which is the effects of thermo-chemical state of early Earth on thermal evolution of Earth's core and numerical dynamo simulations with boundary heterogeneity calculated from numerical mantle convection simulations directly.