# Geodynamics Seminar

## 第366回ジオダイナミクスセミナー

# Influence of majorite on mantle convection

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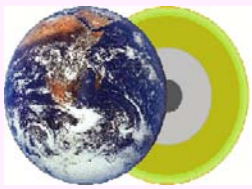
主催：愛媛大学地球深部ダイナミクス研究センター
日時：10/11（金）午後 4時30分～
場所：総合研究棟 I 4F 共通会議室



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## Abstract

Influence of $MgSiO_3$ majorite on the mantle convection has been investigated by using numerical simulations. According to a first principles study (Yu *et al*., 2011), wadsleyite decomposes to an assemblage of majorite plus periclase with a large negative Clapeyron slope. Since stability field of majorite is limited to above ~2200 kelvin in a depth range of 500-660km for $Mg_2SiO_4$ composition, downwellings are considered to be unaffected by this phase boundary. On the contrary, the upwelling plumes may be significantly modified by this phase boundary. The asymmetry on upwelling and downwelling caused by the phase transitions may induce strong effects on the thermal evolution and the thermal structure of the mantle.

In this study, we performed 2-D numerical simulations on thermal convection of the mantle incorporating majorite stability field. According to our numerical results, very hot upwelling plumes are strongly influenced by the phase transitions related to majorite. These hot upwellings are occasionally observed in the simulations even though the average temperature of hot plumes are far less than the stability field of majorite. The dynamics of these upwellings are controlled by the release and the absorption of latent heat induced by the transitions as well as interruption of currents due to the large negative Clapayron slope of the transition between wadsleyite and majorite plus periclase.

詳細は当センターホームページ： http://www.ehime-u.ac.jp/~grc/をご覧ください
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