Geodynamics Seminar

第372回ジオダイナミクスセミナー

Melting experiments on the lower mantle materials using a CO_2 laser heated diamond anvil cell

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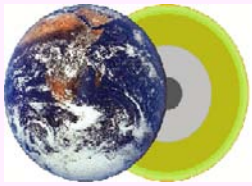
主催：愛媛大学地球深部ダイナミクス研究センター
日時：12/6（金）午後 4時30分～
場所：総合研究棟Ⅰ 4F 共通会議室



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Abstract

Seismological studies suggest presence of ultralow-velocity zones (ULVZ) near the core mantle boundary (CMB). Partial melting of the lower mantle materials has been proposed to explain these zones, but experimental validation at the appropriate temperature and pressure regimes remains challenging. The melting curve of the lower mantle material is a key to constrain the existence of melt at the base of the mantle. A laser heated diamond anvil cell (LHDAC) has been widely used to determine melting temperatures of materials under high *P-T* conditions. Although YAG, YLF lasers (wavelength is about 1 μm) have been generally used for LHDAC experiments, use of metal absorber is required to heat the mantle materials. In contrast, the CO_2 laser with wavelength of about 10 μm can directly heat silicate materials.

In this study, I performed melting experiments on the MgO-$MgSiO_3$ system using the CO_2 laser heated diamond anvil cell. I used forsterite (Mg_2SiO_4) single crystal as the starting material. Ar was used as the pressure medium. After the complete pressure release, the sample was recovered from the DAC and examined by FE-SEM.

Based on the results, I discuss melting temperatures and phase relations on the MgO-$MgSiO_3$ system.

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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