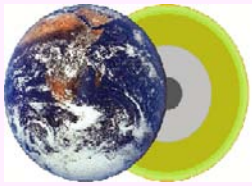
Geodynamics Seminar

第344回ジオダイナミクスセミナー

Melting experiments of water in a diamond anvil cell using double sided CO_2 laser heating system

Dr. Tomoaki Kimura
(Global COE Postdctoral Fellow, GRC)

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



EHIME UNIVERSITY GRC GEODYNAMICS RESEARCH CENTER

Abstract

The phase relations and physical properties of water at high pressures and temperatures are important to physical, geophysical, and planetary problems. For example, recent molecular dynamics calculations suggest that water is superionic at high densities relevant to planets such as Uranus and Neptune, and this predicted property plays a key role in dynamo models to explain the unusual non-dipolar magnetic field structure of these planets. The advances in combining techniques such as synchrotron x-ray diffraction or in situ optical Raman spectroscopy with diamond anvil cell (DAC) technologies allow us to measure the melting temperature of water to within a few percent for pressures up to 20 GPa . However, at pressures above 20 GPa, recently reported values of melting temperature exhibit significant differences with each other. This discrepancy should be caused by a chemical reaction occurred between the metal absorber contained in the DAC and the dissociated water. By using CO2 laser for sample heating, the metal is not necessary because water has significant high absorption in the wavelength range of CO2 laser (10.6 μm). We report the melting temperature of water in a diamond anvil cell more than 35 GPa using CO2 laser heating 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
問い合わせ先：桑山 靖弘（TEL:089-927-8408,e-mail:kuwayama@sci.ehime-u.ac.jp）