Geodynamics Seminar

第329回ジオダイナミクスセミナー

The structure of the Earth's core

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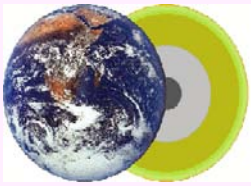
主催：愛媛大学地球深部ダイナミクス研究センター
日時：6/1（金）午後 4時30分～
場所：総合研究棟 4F 会議室



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Abstract

The inner-core and outer-core, which make up the center of the Earth, are thought to be composed predominantly of a solid and liquid iron alloying with 5 to 15 % nickel, respectively. Determination of the physical properties of iron alloy at extremely high pressures found in the deep Earth's core (>300 GPa) is a fundamental issue for understanding the thermal and dynamical state of the Earth's core. According to seismological observations, it is widely accepted that the Earth's inner-core is elastically anisotropic; the compressional wave in the inner-core propagates 3~4 % faster along its rotational axis than in the equatorial direction. A number of models on core dynamics have been proposed to explain the origin of the inner-core anisotropy, but all of them are based on the idea of the crystal preferred orientation of iron. In order to understand the origin of the inner-core anisotropy, I conducted a series of high pressure and temperature experiments on various iron-rich iron-alloys using laser-heated diamond anvil cells on the basis of in-situ x-ray diffraction measurements at SPring-8, along with ab-initio density functional simulations, under the Earth's core condition. Here I will show experimental results on the phase relations of iron alloys at high pressure and a mineralogical model of the observed anisotropy in the inner core based on the experimental and theoretical studies on the physical properties of iron-alloys.

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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