

The 450th Geodynamics Seminar

In situ high P - T X-ray computed laminography and its applications

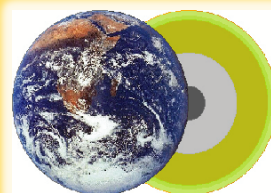
Dr. Ryuichi Nomura (Postdoctoral Researcher, GRC)

Date: 5 Aug. (Fri.) 2016, 16:30 ~

**Venue: Meeting Room #486, Science
Research Bldg. 1, Ehime Univ.**

日時：2016年8月5日(金)16:30~

**場所：愛媛大学 総合研究棟 I
4階共通会議室**



Abstract

The diamond anvil cell (DAC) is a powerful tool to reproduce high-pressure (P) and high-temperature (T) conditions, corresponding to those of the deep Earth interior, in a laboratory (Tateno *et al.*, 2010 *Science*). Various types of measurements such as *in situ* high- P - T spectroscopic measurements and *ex situ* chemical analysis have been conducted using DACs to understand the structure and evolution of the Earth's interior.

Among these techniques, 3D visualization and textural/ chemical characterization of the internal structure of samples at high- P - T is of great importance. Recently, we developed a high-pressure *in situ* X-ray laminography using DAC (Nomura and Uesugi, 2016 *RSI*). In this technique, X-rays can avoid the gasket and pass through the diamonds with the shortest path, which is quite advantageous for dual X-ray energy chemical imaging technique using relatively low X-ray energies (7, 8 keV) (Tsuchiyama *et al.*, 2013 *GCA*) and for ultra-high pressure experiments because it is no longer necessary to use a light metal (for example, Be) as a gasket. In addition, X-ray laminography gives the reconstructed image more consistent with the original one than that by X-ray CT when the projection data are incomplete due to limited rotational angle, the situation DAC experiments faced with due to load-supporting pillars.

In this study, we applied this technique to high- P rotational deformation experiments using DAC. Using the MgO sample with Pt strain marker, we have succeeded in large-strain deformation experiments to 135 GPa. In addition, we have developed high-pressure and “high-temperature” *in situ* X-ray laminography technique by introducing a laser-heating system. In this presentation, we will show our results and future prospects.

詳細は当センターホームページ: <http://www.grc.ehime-u.ac.jp/> をご覧ください
問い合わせ先: 西 真之 (TEL: 089 927 8153, e-mail: nishi@sci.ehime-u.ac.jp)