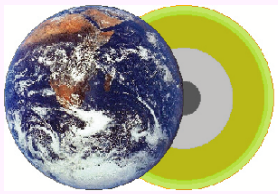
The 410th Geodynamics Seminar

Direct sound velocity measurements of pyrolite at mantle transition zone P,T conditions

Dr. Steeve Greaux (Postdoctoral Researcher, ELSI-ES, GRC)

Date: 02.27.2015 (Fri) 16:30 ~
Venue: Meeting Room #486, Science Research Bldg 1, Ehime Univ.

日時：2015年2月27日(金)16:30～
場所：愛媛大学 総合研究棟Ⅰ 4階共通会議室



EHIME UNIVERSITY GRC GEODYNAMICS RESEARCH CENTER

Abstract

Comparison of seismic data with laboratory measured sound velocities in mantle minerals under high-pressure is a powerful tool toward constraining the mantle mineralogy. The composition and structure of the Earth's mantle if known would represent a major constraint on the thermal and dynamical evolution of our planet from its origin to the present state.

Following recent studies we investigated the velocities of the pyrolite primary mineralogical model for the upper part of the mantle. Previous studies based their conclusions on velocities of HP minerals measured separately, sometime with different techniques. Here we measured directly the velocities of pyrolite aggregates synthesised at different pressures using a large volume press apparatus and a combination of ultrasonic and synchrotron radiation techniques.

Our results showed a clear contrast in between the velocities of samples synthesized at 10 GPa and those made at 17 GPa in agreement with the Olivine-to-Wadseleyite transformation at ~14 GPa. Another velocity increase was also observed in situ at P higher than 20 GPa, which correspond to the formation of the Ringwoodite phase. The velocity gradients associated with those phase transformations are well consistent with PREM in the lowermost transition region but fail to explain its uppermost part especially at the 410 km depth discontinuity.

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： 出倉 春彦（TEL:089-927-8408, e-mail:dekura.haruhiko.mf@ehime-u.ac.jp）