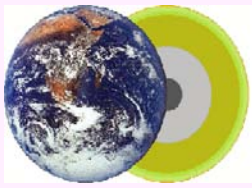
# Geodynamics Seminar

## 第308回ジオダイナミクスセミナー

# Numerical studies on the stagnation of subducted slabs in the mantle transition zone

**Dr. Masanori Kameyama**
(Associate Professor, 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：11/4（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

We are developing numerical models of mantle convection in order to study the dynamic phenomena caused by the subduction and stagnation of slabs. A time-dependent convection in a two-dimensional rectangular box of 2000 km height and 6600 km width is considered under the extended Boussinesq formalism. The plate subduction is imposed by a similar manner as in Torii and Yoshioka (2007), where the descending motion of a cold and viscous fluid is a priori given along with a prescribed "guide" from the top surface to the transition zone. In addition, the cold fluid is horizontally ejected at the bottom end of the guide, in order to reproduce the horizontally-lying slab at the base of the upper mantle. We also take into account the effect of trench retreat, by assuming the subduction below an actively overriding continent which moves oceanward at a given rate with respect to the deep mantle. We have conducted preliminary calculations by varying (a) the absolute velocities of subducting and overriding plates, and (b) viscosity jump associated with the phase transition at the 660km depth. Our calculations show that the motion of overriding plate is of the primary importance on the formation of stagnant slabs: For a sufficiently fast trench retreat, the subducting slab tends to stagnate near the 660km depth. We also found that the stagnant slabs "floating" around the 660km depth are hardly formed solely by the effect of phase buoyancy at the discontinuity. This indicates that the slab stagnation of the Earth mainly comes from an interplay between the surface motions and the phase transition at the 660km depth.

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）