Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

SIT07-14 会場:A03 時間:5 月 25 日 14:45-15:00

日本周辺の沈み込み帯のトモグラフィー、地質発展史、数値モデルの結合
Combining tomographic results, geologic history and geodynamic modeling in the subduction zones around Japanese Islands

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In this presentation, I show the slab feature estimated from the seismic tomography result combined with the recent estimate of d(ln Vp)/dT [Karato, 2008] and the upper limit of potential temperature estimated from the deep earthquakes and the theoretical modeling of the subducting slab [Emmerson and McKenzie, 2007]. Obtained results show a significant gap and/or the diluted slab in the topmost lower mantle just below the stagnated slab in the transition zone, that is consistent with the previous view of the flushing or avalanche of the mantle flow caused by the interaction between the mantle convection and the endothermic phase transition at the 660 km depth. However, such intermittent flow may not occur, if the strongly temperature-dependent viscosity is taken into account. It is also known that the slab morphology, especially, the stagnation of slab, is controlled by the movement of surface plate. Thus, to understand the slab morphology in the subduction zone around the Japanese Islands, I construct a simple 2D model of subduction zone which takes into account the geologic factors such as the opening of the Japan Sea. I find two possibilities of the cause of the existence of such gap and diluted slab: the opening of the Japan Sea and the subduction of old ridge.
Keywords: subduction zone, seismic tomograohy, geologic history, geodunamic modeling, Japanes Islands