Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

SCG72-08 Room:103 Time:May 22 16:30-16:45

Estimation of velocity structure in the oceanic crust of the Pacific slab beneath northeast Japan form PS converted wave

SHINA, Takahiro[1*], NAKAJIMA, Junichi[1], MATSUZAWA, Toru[1]

[1]RCPEV, Grad. Sch. of Sci., Tohoku Univ.

Seismic tomography (e.g. Nakajima et al., 2009) and receiver function analysis (Kawakatsu and Watada, 2007) have revealed the existence of the low-velocity oceanic crust at the uppermost part of the Pacific slab beneath the northeastern Japan arc. However, these methods cannot estimate a detailed spatial variation in seismic velocity in the oceanic crust.

It is known that P-to-S converted phases at the plate interface are often observed in seismograms of intraslab earthquakes. Matsuzawa et al. (1986) examined arrival times and amplitudes of PS converted phases and suggested the existence of a low-velocity layer at the top of the slab down to a depth of at least 150 km. Here we estimate P-wave velocity structure in the oceanic crust using PS converted waves recorded at a nation-side seismic network.

In this study, we identify PS converted waves using theoretical travel times and particle motions of the waveforms, and read arrival times of the waves. We then estimate P wave velocity in the oceanic crust assuming the geometry of the Pacific plate and seismic velocities in the mantle wedge, arc crust and descending plate. As a result, we obtain P-wave velocity structure of 6.5-7.0 km/s in the fore-arc side and of 7.5-8.5 km/s in the back-arc side. We consider that these velocity variations are related to phase transition in the oceanic crust.

Keywords: PS converted wave, oceanic crust, Pacific slab