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

SSS34-P11 Room:Convention Hall Time:May 21 13:45-15:15

Estimation of velocity discontinuities in and around the swarm seismicity region beneath the Kii Peninsula (Part 2)

DOI, Issei[1*], KAWAKATA, Hironori[1]

[1]Ritsumeikan Univ.

There is a non-volcanic swarm seismicity beneath the Wakayama region, southwest Japan (Mizoue, 1971; Matsunami and Nakamura, 2004). Recent studies such as reflection analysis (Mizoue, 1971) and receiver function one (e.g. Yamauchi et al., 2003; Shiomi et al., 2008; Ueno et al., 2008; Shibutani et al, 2009) have revealed the distributions of the Moho and the Conrad discontinuities in this region. Kato et al. (2010) conducted the dense seismic observation in the southern region of the swarm activity and detected the low Vp/Vs region at depth of 25 km through travel time tomography. Though crustal structure has been studied in this region, the mechanism of the swarm activity is not still completely understood.

In this study, we investigated lateral velocity discontinuity distribution in and around the swarm region, using Sp converted waves from earthquakes which occurred in Philippines Sea Plate. We used waveforms recorded at seven Hi-net stations in the Wakayama region from 94 events at depths of 40-70 km. First, two horizontal components were rotated into radial and transverse ones and picked P and S times by eyes. Then, the travel time of the Sp converted wave is connected to the converted point, assuming Vp 6.0 km/s and Vp/Vs ratio 1.73. Dividing the analysis area into blocks with the horizontal and vertical length 5 km and 2 km, respectively, we stacked the amplitudes in the blocks which the converted point corresponding to the travel time of the Sp converted wave lies in.

As a result, we found velocity discontinuities at depths of 5 km and 10 km beneath the swarm region and 20 km beneath all over the analysis area. Amplitudes corrected in terms of radiation pattern are used to calculate the conversion coefficient at each velocity discontinuity. This information will be useful to discuss the relationship between velocity discontinuities and the generation process of the swarm activity.