S157-003 **Room: 303** **Time: May 18 9:30-9:45**

Numerical simulation of remarkable later phases for events occurred within the subducting Philippine Sea slab

Takumi Hayashida[1]; Fumiko Tajima[1]; James Mori[2]

[1] Hiroshima U. Department of EPSS; [2] EQH, DPRI, Kyoto Univ.

Later phase arrivals help us to construct more realistic 2D/3D seismic velocity models. Several significant later phases are recorded at many stations in southwest Japan for events occurring within the subducting Philippine Sea slab (e.g. Okada *et al*, 1990; Ohkura, 2000; Miyoshi and Ishibashi, 2007). A distinct later phase, has been detected in seismograms between *P*- and *S*-wave arrivals at epicentral distances of about 70 km or more for aftershocks of the 2001 Geiyo earthquake. Characteristics of the phase are as follows;

(1) The dominant period is about 1 Hz (nearly same or slightly slower than that of the *P* wave).

(2) The phase is predominantly observed on the radial and vertical components of velocity seismograms.

(3) The phase is clearly observed at borehole stations that are distributed of the stations covers a wide range.

(4) The apparent velocity is almost 6.1 km/s, corresponding to the *P*-wave velocity in the uppermost crust.

(5) The amplitude is slightly smaller or larger than that of the *P* wave.

(6) The amplitude on the radial component is nearly the same or slightly larger than that on the vertical component. We attempt to explain the characteristics of this phase using the e3d finite difference code by Larsen and Shultz (1995). The constructed model covers a region that extends 200 km in the horizontal and 100 km in depth, with a grid interval of 0.2 km. Parameters of each layer are based on the models of Kakehi *et al*. (2004) and Iwata *et al*. (2008), and the depths of the Moho and Conrad discontinuities are inferred from the receiver function images of Shiomi *et al*. (2004) and Ueno *et al*. (2008). The simulated waveforms can explain characteristics of the later phase well and the snapshots of seismic wave propagation indicate that this phase corresponds to a depth phase of *sP*, which is a *P* wave reflected from a direct S wave at the Earth's surface. The *sP* phase is clearly seen in the simulated waveforms at epicentral distances of about 70 km or more. This is in good agreement with the features of the observed data. We also explain the travel times of *S* conversions from the Moho and Conrad P refrections which are clearly observed in recordings of the several stations by adjusting the depths of the Moho and Conrad discontinuities.