

Simulation of characteristic late arrivals after S-wave of local events between Amagasaki and Higashinada in Osaka sedimentary basin

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Tanaka et al.(2014,2015, SSJ fall meeting) analyzed distinctive later arrivals after direct S-waves of local events at Amagasaki strong motion station (CEORKA), and at Ashiya, Fukuike, and Fukae temporary strong motion stations (Iwata et al., 1995). They found that the polarization angles and the linearity of those phases changed systematically with according to the number of reverberations at Amagasaki station, whereas there are not significant phases appeared at other three stations. Those findings suggest that the three-dimensional basin velocity structure affects the reverberation characteristics.

To confirm the observation characteristics, we then conducted the three-dimensional ground motion simulations up to 2Hz using a three-dimensional basin velocity structure model (Sekiguchi et al., 2013) and a double-couple point source model. The simulation reproduces the observation well and proved that those systematic characteristics of the distinctive later phases are caused by the three-dimensional shape of the basin/bedrock interface. From the simulation results, the Amagasaki station locates in the area where the distinctive late phases can be observed clearly. On the contrary, other three stations locates in the area where the S-wave reverberations and the basin-induced surface waves appear simultaneously so as to contaminate clear arrivals.

Keywords: Osaka sedimentary basin velocity structure model, ground motion simulation, multiple-reflection