

Local site effects observed in KiK-net strong-motion records

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Ground motions of more than 110 events were recorded at eighteen KiK-net (KIBAN Kyoshin network) stations in Hiroshima prefecture since 2000. We investigated characteristics of local site amplification between the borehole and surface recordings of selected 36 events (Tajima et al., 2005; Hayashida and Tajima, 2005). The major factors to control site amplification are hypocentral location (depth, hypocentral distance and direction) and near surface geological conditions.

In this study, we estimated peak ground acceleration (PGA), peak round velocity (PGV) and seismic intensity at KiK-net stations using proposed attenuation relationships (Si and Midorikawa, 1999; Midorikawa et al., 1999) and subsurface V_s structure. As a result, observed PGA and PGV tend to show large variance among stations in comparison with estimated values. As for seismic intensities, the ratios of observed/estimated values tend to decrease with hypocentral distance. The ratios of several stations shows large deviation even for short distance (within 100km) events while the distance dependency is discussed by Midorikawa and Ohtake (2003). Similar tendencies are observed in the ratios of a_s/a_b (peak amplitude on the surface/ peak amplitude in the borehole). The variance among the stations is examined focusing on the frequency dependent amplification coupled with local geological conditions. Seismic intensities are also examined in view of amplification spectrum between the borehole and surface recordings. The dominant spectra seem to be the main factor that caused difference between estimated (around 1 Hz) and observed (variable) values of seismic intensity.