

Heterogeneity in the upper mantle around the Western Pacific Region as revealed from analyses of teleseismic P-coda waves

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We systematically examine spatial changes of lateral heterogeneity of the upper mantle around the western Pacific region, analyzing transverse components of teleseismic P-coda waves recorded by JISNET in Indonesia, FREESIA in Japan, and IRIS. Spatial distribution of averaged amplitudes of the transverse component is well consistent with the tectonic settings at each station. Large amplitudes of the transverse component are generally observed at the stations located on island arcs, while small amplitudes at the stations located on stable continents for the frequency range between 0.04-2.56 Hz. We further determine the vertical distributions of the scattering coefficients by applying an envelope seismogram inversion method to the observed transverse components of teleseismic P-coda waves for 60 s. The large scattering coefficients are observed at a depth down to 100 to 300 km beneath the island, which probably represents large heterogeneous structure caused from magma diapir and subducting slabs related with cold plumes. The scattering coefficients beneath the stable continents are estimated to be less than 20 % of those beneath the island arcs, but the results show that, even beneath the stable continents, weak lateral heterogeneity continue down to 300 km or more.