

Short-wavelength heterogeneity in the lowermost mantle beneath western Pacific using core-reflected phases

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Many previous seismic observations have shown that lateral heterogeneity of the lowermost mantle is characterized by two significant features, the colder Circum-Pacific region and the hotter central Pacific. Clarifying the origin of the two anomalous features is one of the most important issues for deep Earth geodynamics. Detailed information on the compressional and shear velocities at the base of the mantle provides important constraints on the physical properties of the anomalies. In this work, we present results from a study beneath the western part of the Circum Pacific region using short-period core-reflected ScP and PcP phases recorded by the Hi-net seismic network. Stacking high-frequency seismograms from a small-aperture array enables us to detect short-wavelength lateral heterogeneity in this region. Our results are interpreted in terms of thermal/chemical heterogeneity in the lowermost mantle. The present results are also compared with the previous ones, mainly focusing on the wavelength of the heterogeneity, seismic properties and physical constraints.