

地震波形分析から示唆される中央太平洋下マントル 最下部における超低速度領域の存在

Seismic Evidence for Existence of an Ultra-low Velocity Zone in the Lowermost Mantle Beneath the Central Pacific

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We consider waveform data for nine events in Papua New Guinea recorded at stations in North America that sample the lowermost mantle beneath the central Pacific. Two of these events have high-quality waveforms. We interpret the waveforms for these two events using forward full-waveform modeling and derive 1-D models appropriate for the study region. We show that a strong later phase (also noted by previous workers) about 25 s after the S arrival at epicentral distances from about 90 to 110 degrees and azimuths from about 50 to 65 degrees can be explained as an ScS phase (or diffracted ScS phase) produced by a low velocity zone (LVZ) with a thickness of about 120 km and a velocity decrease of about 5% underlain by an ultra-low velocity zone (ULVZ) with a thickness of about 50 km and a velocity decrease of about 30%. These low velocities imply the presence of a significant amount of iron.