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Nontransparent uppermost mantle below Moho boundary in Japan

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Despite its importance to the study of crustal revolution, the detail features of the Moho discontinuity remain poorly understood largely because of the difficulty of directly sampling significant portions of it. Seismic reflection profiling is highly effective in imaging the structure of the shallower part of the crust. Several big projects have revealed the seismic structure of the crust and uppermost mantle including the geometry of Moho-discontinuity in continental regions. The lower crust is characterized to be reflective. On the other hand, the crust and uppermost mantle structures in Japan had not yet revealed. Many refraction surveys had been done in Japan. The seismic profiles with long profile line are analyzed. In Japan, a remarkable feature, which is showing long duration coda-wave after the PmP-wave (reflected wave at the Moho boundary), is observed on the record section. Several possible models are considered to explain the long duration coda-wave. Three reliable models, which are 1) distorted Moho boundary model, 2) reflective uppermost mantle below Moho model and 3) a model that many scatterers are located in uppermost mantle below Moho, are examined. The transparent upper most mantle model is not suitable to explain the observed data in Japan. The scatterer located in the uppermost mantle model is the best model for the explanation of the long-duration coda-wave. We estimate the scattering coefficient of the uppermost mantle and crust. The obtained values indicate that the scattering coefficient at the uppermost mantle is equivalent to that of reflective lower crust, resulting in uppermost mantle in Japan is not transparent. Many scatterers are located in the uppermost mantle below Moho. The sacatterers in the uppermost mantle might be caused by magmatism at the island-arc. The "nontransparent uppermost mantle" will be an important characteristic to the island-arc. This will be a good key to understand the formation process of Moho boundary and evolution of crust and

uppermost mantle in island-arcs.