

Depth of the Moho discontinuity beneath the Japan Islands estimated by travel-time analysis (3)

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The crustal structure beneath the Japan Islands including depth of the Conrad and Moho discontinuities was estimated with tomography method. Bottom of surface layer, the Conrad and Moho discontinuities were modeled by two-dimensional B-spline functions, and velocity in layers was expressed by three-dimensional B-spline functions. The depths of discontinuities and velocity distribution in the layers were estimated simultaneously by the least squares method. Velocity structure was estimated from shallow parts to deeper parts sequentially to avoid correlation between them. This sequential analysis allowed to obtain good depth resolution.

The estimated deepest region of the Moho discontinuity was located at the central Honshu, and it reached about 40 km. The estimated Moho depth has features as deep in the central Chubu, deeper in inland areas than in coastal areas, relatively deep in Shikoku and eastern Kyushu, and shallow in the Chugoku District. Those features are consistent with the result by Zhao *et al.* (1992).

The result was compared also with those of seismic refraction surveys and receiver function analyses, and it was found that the obtained model was consistent with results of many surveys. But the result is inconsistent with deep Moho in the Chugoku District obtained by Shiomi *et al.* (2004).

We used seismic data from the National Research Institute for Earth Science and Disaster Prevention, Hokkaido University, Hirosaki University, Tohoku University, University of Tokyo, Nagoya University, Kyoto University, Kochi University, Kyushu University, Kagoshima University, the National Institute of Advanced Industrial Science and Technology, Tokyo metropolitan government, Shizuoka prefectural government, Kanagawa prefectural government, the City of Yokohama, the Japan Marine Science and Technology Center, and the Japan Meteorological Agency.