

Depth distribution of seismogenic layer in the Japanese Islands on the basis of the JMA hypocenter catalogue (2nd report)

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The JMA revised hypocenter determination method in October 2001 by adopting a new travel-time table called 'JMA2001' and a new weighting function. Accuracy of hypocenters was greatly improved by the revision. Basing on the new catalogue, we reported spatial variation of the depth of seismogenic layer in the Japanese islands at the spring meeting last year. But removal of low frequency earthquakes around volcanoes as well as those near the surface of subducting Philippine Sea slab was not complete, and the criterion of separating out crust earthquakes from slab earthquakes was not clear for the region around the Izu Peninsula. Therefore, we remade a new file for crustal earthquakes using the JMA catalogue during the period of six years from October 1997 till September 2003. Then, we investigated again the depth distribution of the seismogenic layer by calculating depths where cumulative number of earthquakes counted from the top side amount 10%, 50%, and 90%, respectively for each of 0.1 degree and 0.1 degree mesh area. Followings are characteristics of the overall spatial distribution of the seismogenic layer in the Japanese islands.

1. In northeastern Japan, the seismogenic layer is deep along both coasts of Pacific Ocean and Japan Sea except an area near Okushiri Island where the 1993 southwestern Hokkaido earthquake occurred.
2. In Kanto, Tokai, Kii Peninsula and south coast of Shikoku where the Philippine Sea slab subducts, seismogenic layer is deep. However, the seismogenic zone in the Izu Peninsula is shallow.
3. Seismogenic layer is noticeably shallow along the belt running in Honshu island from the backbone in Tohoku through Chubu alpine area to San-in mountainous region.
4. Along the Median Tectonic Line in the Kii Peninsula and in Shikoku, the seismogenic layer is shallow. In Beppu-Shimabara graben where corresponds to an extension of the MTL to the west, the seismogenic layer is also shallow.
5. Compared with seismogenic layer in mountaneous area, that in lowlands such as the Kanto plain, Nobi plain and Seto inland sea area is relatively deep.