

P wave velocity tomography in the source area of the 1993 Hokkaido-Nansei-Oki earthquake (No.2)

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The 1993 Hokkaido-Nansei-Oki earthquake (M7.8) ruptured the entire seismogenic zone in the eastern margin of the Sea of Japan. The event is considered to occur in the plate boundary between the Eurasian and the North American (or the Okhotsk) plates. It is very important to know the present situation of the boundary in terms of large earthquake prediction. In order to determine the accurate locations of aftershocks, 23 OBSs were deployed about one week later. The picking data of the aftershocks at OBSs gave us opportunity to image the 3-dimensional P wave tomography in the seismogenic zone. Here, P wave velocity tomography inversion method is applied to 1031 P wave picking data from the seismogenic zone. It gave us the strong relationship between seismic activity and velocity anomaly. The remarkable aftershock regions is roughly considered to be in the northern and southern parts of the seismogenic zone ranging 10km ~ 20km in depth. These aftershock regions are clearly corresponding with the low velocity regions, while the main earthquake is considered to occur near the southern boundary of the north low velocity region.

The problem which we have to consider here is what would control the occurrence of aftershocks. The most important point of this problem is that the low velocity is considered to be a close connection with the potential of aftershock occurrence. Therefore, we must draw attention to not only P wave velocity imaging but the materials in the seismogenic zone in this plate boundary. A further direction of this study will be provide more evidence for this result.