

Crustal structure in the central Kinki district, Japan

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We conducted a three dimensional tomographic analysis to image the crustal structure in and around active faults in the central Kinki district, Japan. About 6,100 earthquakes that occurred in the target area during the period from 1998 to 2004 were selected from the JMA catalogue. They are recorded at about 90 stations, most of which are installed at the bottom of the boreholes, in the target region and includes more than 130,000 arrival time data for both P- and S-wave. We applied Zhao et al. (1992)'s code to obtain the tomographic image.

Surface traces of the active faults well coincide with the low velocity regions in the result of 5 km depth. Examples are Arima-Takatsuki Tectonic Line, Hanaore fault, faults along west coast of Biwa lake, and Mitoke-Nishiyama fault system. This tendency is clear in both P- and S-wave images. Correlation between low velocity region and active faults are recognized as deep as 15 km.

Okada et al. (2004) clarified that the Nojima fault, which is the source region of the 1995 Kobe earthquake, exhibits low velocity feature along the fault trace. Our result shows similar trend in other active faults in Kinki district.

Recent studies (e.g. Iio and Kobayashi, 2001) indicate that active faults have their extensions not only in the upper crust portion but also in the lower crust aseismically. Our results indicate that active faults exhibit low velocity feature at least within the upper crust portion. It is a feature issue if we could image the active faults in the lower crust portion.