

## A detailed 3D seismic velocity structure around the Atotsugawa fault system, central Japan, inferred from travel-time tomography

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The Atotsugawa fault is known to be one of the most active faults in the Niigata-Kobe Tectonic Zone (NKTZ)[Sagiya et al., 2000]. The fault is a strike-slip fault with a right lateral displacement and its strike is approximately N60E with almost vertical fault plane. Seismicity along the fault is active and shows a spatial variation. In the central part of the fault the seismicity is rather low compared to that in the western and eastern parts of the fault. The joint research project has started in 2004 to enhance our knowledge on the deep structure around the Atotsugawa fault, and 73 seismograph stations have been installed around the fault in the frame work of the project, which results in a dense seismograph network with a spatial separation of ~10 km.

We performed a travel-time tomography to reveal a detailed 3D velocity structure around the Atotsugawa fault system. The tomographic method of Zhao et al. (1992) was applied to arrival-time data recorded at temporal stations around the fault. The total number of earthquakes used in the inversion is 615. Horizontal grid nodes spaced at intervals of 0.1 degrees were set in the study area (35.6-37.0N, 136.6-138.4E) and vertical grid nodes were set at depths of 0, 5, 10, 15, 20, 30, and 40 km. The 3D model obtained by Nakajima and Hasegawa [2007] was used as an initial model.

Obtained results show that the velocity structure varies along the strike of the Atotsugawa fault. The volcanic regions in the eastern and western parts of the fault exhibit an extreme low-velocity anomaly and the depth limit of earthquakes is shallower. A low-velocity zone exists below the seismogenic zone in the central part of the fault, where seismic activity is low down to a depth of ~7 km. These observations suggest the spatial relationship between seismicity and heterogeneous structure along the fault.