

Crustal structure around the Atotsugawa fault derived from a dense seismic array observation

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The velocity structure at the western segments of the Atotsugawa fault system is elucidated by inverting the arrival times from 239 local earthquakes and 6 explosive sources using double-difference tomography. Fifty five temporal seismic stations were deployed along the linear array sub-perpendicular to the fault strike between August and October in 2004. The high P-wave velocities are imaged at depths greater than 2 km beneath the surface traces of the Atotsugawa fault system and tilt to the southward with a low dip angle. The top of the high velocity bodies become deep at the northern- and southern- areas from the center of the Atotsugawa fault system, showing a convex upward shape within the Niigata-Kobe Tectonic Zone (NKTZ). The high velocity bodies markedly coincide with the high electrical resistivity zones. The lateral variations of the upper crustal structures could partially contribute to the large compressional strain increase observed in the NKTZ.

We furthermore conducted the seismic observations along the Atotsugawa-fault system using sixty temporal seismic stations between July and September in 2005. Five explosive sources were fired along the array. The preliminary result of the tomography shows that the high velocity body imaged at the western segment distributes to the edge of the central (creep) segment along the fault strike. It is interesting that the slightly low velocity body is imaged at the central segment.