

P- and S- wave velocity structure in the Itoigawa-Shizuoka Tectonic Line after 4 years of dense offline stations observations.

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The ISTL is a major tectonic structure that divides the Japanese Island arc into northeast and southwest parts. It was formed as a normal fault in the early Miocene and represents the southwestern boundary of the northern Fossa Magna rift basin to the north (Sato et al. 2004), and the boundary between the Japanese arc accretionary prism units and the Izu-Bonin arc crust to the south (Kano 2002). The online permanent seismic station network in the area is not sufficient to accurately locate the earthquakes occurring in the area and also not dense enough to provide a detailed structure of the earth's crust.

Over the past few years we have installed temporary seismic stations in the south and central part of the STL. We have deployed 58 stations in the area south of Lake Suwa from 25th of August 2003 to 16th October 2003, 60 stations in the Akaishi mountain range and Kofu basin areas from 16th September 2005 to 22nd December 2005, 60 stations in the area north of Lake Suwa from 12th September 2006 to 12th December 2006 and 33 stations south of Lake Suwa from 21st August 2007 to 23rd November 2007. In total we have deployed 211 offline stations over a 4 year period. We have combined the data retrieved from the temporary stations with the data available from the online permanent stations in the ISTL area and manually re-picked 84,122 P- and 94,641 S- wave arrival times from 2548 events from the 5th August 2003 to 30th November 2007. The Double Difference tomography method (Zhang and Thurber, 2003) was used in order to accurately relocate the hypocenters and obtain a 3D P- and S- wave velocity (V_p and V_s) structure beneath the Akaishi mountain range, the Kofu basin and area north of Lake Suwa.

The relocated hypocenters in the southern ISTL coincide with the deeper extension of the active faults in the area. The relocated hypocenters are deeper than those reported by the Japan Meteorological Agency (JMA) in the northern ISTL and shallower at the central and southern parts. The tomographic analysis has provided a detailed V_p and V_s image of the crust in the area below the ISTL. The 3D velocity model that we have acquired of the crustal structure in the area is in accordance with the geological boundaries. The average depth of the hypocenters is shallower in the northern ISTL (3 - 8 km) and gets progressively deeper towards the central (8-15 km) and southern (15-25 km) ISTL. The northern tomograms fit accurately with the deeper extension of the Matsumoto basin and the central uplift zone geological units. In the central ISTL, the Yatsugatake volcano magmatic conduit was imaged. In the southern ISTL, we imaged the downwards continuation of the low grade metamorphic rocks that constitute the Chichibu-Shimanto belts of the southwest accretionary prism of the Japanese arc, and of the igneous rocks that form the Izu-Bonin arc crust (submitted in EPS).