

The plate boundary fault in the northwestern margin of Izu-collision zone: 2011 Hakone-Fujiyoshida seismic survey

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The boundary between the Philippine Sea (PHS) and Eurasia (EUR) plates is uncertain due to the widely spread young debris flow and avalanche deposits (ca. 2900 yr: eg. Miyachi et al., 2004). Deep seismic profiling revealed the existence of aseismic slab beneath the Misaka range, NW of Izu collision zone, suggesting the probable blind active thrust beneath Mt. Fuji.

To reveal the crustal structure of the eastern flank of Mt. Fuji, we carried out the deep seismic profiling along the 34-km-long seismic line. Seismic signals were recorded by fixed 773 channel recorders. We used four vibroseis trucks as a seismic source. For wide-angle survey, we produced high energy shots at 2.5 km interval by stationary sweeps of vibroseis trucks and dynamite (100 kg). Obtained seismic data were processed by CMP reflection analysis and Multi dip CRS method. Velocity profile was obtained by turning ray refraction tomography analysis.

Obtained migrated, depth-converted seismic section and velocity profile portray the high velocity part, which corresponds to the Miocene Tanzawa Group in the western part of the seismic section. The depth of the top of high-velocity ($V_p > 5.4$ km/s) part rapid increases from 2.5 km to 5 km beneath Gotemba. Based on the pattern of reflection, this velocity changes is marked by estimated fault, dipping to north with 30 degrees dip angle. This fault is the southwestern extension of the Kannawa fault. According to the high resolution survey at Oyama by Ishiyama et al (2012, JpGU), two splay faults is estimated in the east of the Kanawa fault at Gotemba. The volcanic products of the Hakone volcano were marked by west-dipping reflectors can be traced beneath the Gotemba. Beneath the Hakone volcanic products, 3-km-thick sedimentary package is estimated by velocity profile. Based on the surface geology, beneath the Hakone volcanic products 5 to 6-km-thick steeply dipping, trough fill sediments (Ashigara Group) are cropping out. This sedimentary layer corresponds to the Ashigara Group. Since 1 Ma after the increase of NW compression, shortening deformation of the Ashigara Group prevailed beneath the present Hakone volcano forming stacking thrust sheets at the toe of the subduction megathrust. Since 0.6 Ma after covered by the Hakone volcanic products, main displacement was progress near the Kannawa fault as an out-of-sequence thrust. The whole thrust system was covered by the Gotemba debris avalanche and debris flow. To understand the length of this blind active thrust and paleoseismic activity, detailed study is needed to estimate potential seismic and also volcanic hazards.