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# Seismic investigation of the plate boundary beneath Mt. Fuji, the Izu collision zone, central Japan

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The Philippine Sea plate (PHS) is being subducted beneath Honshu, associated with the buoyant subduction of the Izu-Bonin arc. In the Izu collision zone, the buoyant subduction and collision produced the complicated strain partitioning along the active faults. To evaluate the seismic hazards produced by these active faults, to reveal the strain budget is crucial. However, covered by thick volcanic products by Mt. Fuji, northwestern plate boundary of the Izu collision zone is poorly understood. We performed deep seismic reflection profiling across the flank of Mt. Fuji and Hakone volcanoes to reveal the boundary between Eurasia (EUR) and Philippine Sea plate. To obtain the seismic image through highly attenuative volcanic products, we used four vibroseis trucks and explosives (<50 kg). For recording, we used 780 channels along the 34 km long seismic line. To obtain high-resolution image of the shallow part of the fault, we performed shallow high-resolution seismic reflection profiling, using Mini-vib (IVI) and a 200 channels recording system. The shot and receiver intervals were 10 m. Velocity profile obtained by refraction tomography portrays the westward dipping thrusts beneath the eastern flank of Mt. Fuji. The frontal thrust can be traced down to 4 km in depth on the reflection profile. The high-resolution seismic section suggests that the thrust displaced the shallow sediments just below the Gotemba debris avalanche deposits dated 2.9 ka (Miyachi et al., 2004). Covered by the thick mudflow deposits, there are no morphotectonic evidences along the fault, suggesting that the final seismic event is older than 2.9 ka. At the northwestern part of the Izu collision zone, based on the lack of seismicity associated with down-going slab, some researchers were estimated the lack PHS-slab. Also, due to the lack of morphotectonic evidence, this boundary was thought to be completely locked. However, aseismic PHS slab was clearly demonstrated by wide-angle reflection down to 40 km in depth in the northwestern part of the Izu collision zone (Sato et al., 2006). The existence of active fault accords well with the existence of slab. Judging from the age of final seismic event, the slip-rate of this newly found fault is smaller than that of other PHS-EUR margin, suggesting that the main convergence of PHS and EUR may accommodate along other faults covered by volcanic products and the mid-crustal detachment in the crust of Izu peninsula.