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A newly-found active fault in the Izu peninsula: the Kanogawa fault and its seismotectonic implication

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During the past 20 years since the 1995 Mw6.9 Kobe earthquake, many studies have investigated the presence and recent activity of active faults and assessed the seismic hazard associated with the active faults in Japan, but many unknown active faults that triggered the damage earthquakes, such as the 2013 Awajishima Mw5.8 earthquake (Lin et al., 2015). Therefore, it is necessary to do more work for identifying active faults and assessing their recent activity including the slip rate and paleoseismicity and to reassess the seismic hazard associated with active faults in Japan.

It is well known that many active faults developed in the Izu peninsula, central Japan, that triggered large earthquakes caused great damages, e.g., the Tanna fault that triggered the 1930 M 7.3 earthquake, the Ishirozaki fault that triggered the 1974 M 6.9 Izuhandtou-oki earthquake. Besides the 1930 and 1974 earthquakes that triggered by the well-known active faults, there are many other damage earthquakes that caused by unknown active faults in the Izu peninsula during the past half century, e.g.,the 1934 M5.5 Amagijoyama earthquake, 1976 M5.4 Kawatsu earthquake, 1978 M7.0 Izu-Oshima Kinkai earthquake, and 1980 M6.7 Izu-Touhou-oki earthquake. In this presentation, we report the tectonic topography that characterizes recent faulting along a newly-found fault, called the Kanogawa Fault, developed in the central Izu peninsula, parallel to the Tanna fault in the east side. This fault strikes north-south, extends from Mishima City in the north through the Amagi-Touge (Amagi pass) in the south for $>$30 km. The analysis on the tectonic topography and identification of active faults were mainly based on interpretations of aerial photographs, topographical maps of 1:25,000, and 3D perspective images made with Digital Elevation Model (DEM) data with 10-m-contours and field investigations. The analytical results and fieldworks reveal that the distinct fault scarps developed on the low-high terrace risers and alluvial fans, along which the vertical offsets measured in-site range from a few centimeters to $>$10 m. This finding indicates that the offset has been accumulated on the fault in the recent geological time since the formation of the terrace risers and alluvial fans.

Reference:

Lin, A., Katayama, S., and Kubota, Y., 2015. Structural analysis of seismogenic fault of the 2013 Mw5.8 Awaji Island earthquake, NW Japan. Bulletin of Seismological Society of America, in press.

Keywords: Izu peninsula, active fault, Kanogawa fault, tectonic topography, DEM image, Aerial photography