

Report on the Fujikawa kako fault system ~ Itoigawa-Shizuoka Tectonic Line seismic profiling, FIST.

Ken-ichi Kano^{1*}, Yasutaka Ikeda², Tanio Ito³, NOZAKI, Kenji⁴, Satoshi Yamakita⁵, Tetsuya Takeda⁶, Shintaro Abe⁷, Takaya Iwasaki², Kiyoshi Kato⁸, SATO, Tsuyoshi³, Hiroshi Sato², Toshiki Watanabe⁹, Akira Fujiwara¹⁰, ABE, Susumu¹⁰, Kei Odawara¹¹, MATSUYURA, Yoshiki¹²

¹Shizuoka University, ²University of Tokyo, ³Teikyo-Heisei University, ⁴Chiba University, ⁵Miyazaki University, ⁶NIED, ⁷AIST, ⁸Komazawa University, ⁹Nagoya University, ¹⁰JGI, ¹¹Onken, Kanagawa Prefecture, ¹²Geebec

A seismic reflection experiment was conducted across the collision/subduction transition zone of the northwestern border of the Philippine Sea Plate just before the completion of the New Tomei EXWY in April in 2012. Its 36-km-long seismic line started from the east of the Fujikawa kako fault system, and ended at the west of the Jumaiyama Tectonic Line crossing the Itoigawa-Shizuoka Tectonic Line. The experiment is named the Fujikawa kako fault system ~ Itoigawa-Shizuoka Tectonic Line seismic profiling, FIST for short. It was composed of the deep and the wide-angle reflection experiments along the whole line, and of the high resolution one across the Omiya and the Agoyama faults in the Fujikawa kako fault system. First of all, we present the shallow structure of the Fujikawa kako fault system revealed by the FIST profiles.

(1) Omiya fault

The high resolution profile indicates that the reflector of the Omiya fault is traceable as a w-dipping reverse fault from the surface (the ridge of the Hoshiyama hills) at about 20 degrees down to 1000m deep, and at about a little less than 40 degrees down to 2000 m deep, although Yamazaki (1992) thought it as a high angle normal fault. Its vertical displacement of 3600-m/s-strata is estimated about 1000 m. The northeastward tilting of the surface along the northeastern margin of the Hoshiyama hills (Nakata et al., 2000) corresponds probably to the drag of the hanging wall of the Omiya fault.

(2) Agoyama fault

Unfortunately there is no information on the Agoyama fault in the profiles. A minor thrust may exist about 1 km east of the Agoyama fault.

(3) Shibakawa fault

The Shibakawa fault is traceable as a west-dipping reverse fault at about 45 degrees down to 3500 m deep, as discussed in Part II. Although the 4200-m/s-strata are displaced vertically at about 1000 m by the fault, the overlying 3600-m/s-strata are only at 500 m. This may suggest that the present main activity of the Fujikawa kako fault system has been shift to the Omiya fault.

The Noshita fault, which runs about 2 km west of the Shibakawa fault, does not belong to the present Fujikawa kako fault system, because it does not displace the strata shallower than the 4200-m/s strata. However it is also a reverse fault, and has the same attitude as the Shibakawa fault. Structurally speaking, the Noshita fault is the westernmost fault of the former system, and belongs to the Fujikawa kako fault system in a broad sense.

We could not find the shallow structure of the faults west of the Noshita fault in the FIST profiles. However several series of very important information on their fault motions is newly collected from the faulted socks of the Neguma and the Tahiroto-Otoshita faults as follows (Nozaki et al., 2012)..

(4) Neguma fault

The main sense was surely normal in motion, although Matsuda (1961) maintained a reverse sense. This new idea coincides with the fact that the strata of the hanging wall was younger than that of the footwall.

(5) Tashiroto-Otoshita fault

The main sense was surely left-lateral with reverse in motion, although Matsuda (1961) maintained a thrust motion. This suggests the fault had the same activity as the Itoigawa-Shizuoka Tectonic line.

Keywords: Fujika kako fault system, Itoigawa-shizuoka Tectonic Line, seismic profiling, shallow structure