

Paleoseismological study of the Kamishiro fault at Kizaki on the Northern Itoigawa-Shizuoka Tectonic Line Active fault system

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The northern ISTL (Itoigawa-Shizuoka tectonic line active fault system) is a 60 km long east-dipping reverse fault system that consists of Kamishiro fault and East Matsumoto Basin fault (EMBF). The Gofukuji fault on the northern end of the middle ISTL, adjacent to the northern ISTL, has the highest activity in the ISTL and high probability of the future event is estimated. The paleoseismology of the northern ISTL is important to discuss about the magnitude of the future event with possible triggering by the rupture on the Gofukuji fault. However, the paleoseismological information on the northern ISTL is limited. Three trenches were excavated on the northern ISTL. The Kamishiro trench exposed 4 events with recurrence intervals between 1250 and 1500 years. The other two trenches on the EMBF exposed only the most recent event that occurred 800–1400 B.P. There is no data to compare the rupture history of the Kamishiro fault and the EMBF. In order to collect reliable data on the past triggered events on the northern ISTL, the Active Fault Research Center, GSJ-AIST has been conducting high-resolution paleoseismological investigation on the Kamishiro fault and EMBF. In 2006 the authors carried out an intensive geoslicer and all-core-boring transect of the Kamishiro fault in south of the Lake Kizaki. The 30 m transect was laid across a west-facing 3 m high and 20 m wide scarp bounding marsh from Holocene terrace on the eastern side. Total 100 m boring cores in 6 holes and 60 m geoslicer slices in 9 holes revealed ~12000 year history of fluvial sedimentation and tectonic deformation. The large slices by geoslicer enabled detailed reconstruction of the sedimentation history. The site is situated at the lower end of an alluvial fan and the sediments consist of coarse fan conglomerate, cross bedded point-bar sands, over-bank fine flood deposits, and buried A horizons. Considering the topographic relief of sedimentary surfaces, precise estimation of tectonic deformation was carried out. Preliminary interpretation indicates 3 horizons of abrupt west-side-down deformation and subsequent burial at about 1000 B.P., 4000 B.P., and 9000 B.P. Each time the west side of the scarp was downthrown by 3 to 5 meters. Precise estimates of the timing and vertical slip in each event will be discussed together with possible segmentation of the northern ISTL.