Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

SSS28-P14 Room:Convention Hall Time:May 27 18:15-19:30

Reconstruction of paleo-slips based on DEMs and geologic sections across the East Matsumoto Basin faults of ISTL

KONDO, Hisao[1*] ; TANIGUCHI, Kaoru[4] ; KATSUBE, Aya[1] ; KIMURA, Haruo[2] ; MORI, Hiroshi[1] ; KUROSAWA, Hideki[3] ; KOSHIKA, Kota[3]

[1]Geological Survey of Japan, AIST, [2]Central Research Institute of Electric Power Industry, [3]OYO COOPERATION, [4]Geological Survey of Japan, AIST (Now at Crearia Inc.)

The ISTL active fault system extending for about 150-160km long is one of the most active fault systems in Japan. The earthquake probability of the Gofukuji fault, composed of the central section of the fault system, is well known to be 14 % in the next 30 years. This estimation is based on paleoseismological researches and long term forecast on the fault, and the maximum size of the next earthquake is expected to be M8 class. However, the size of the next earthquake on the Gofukuji fault is still under the discussion, especially, whether the rupture would propagate with the adjacent faults to the north and south. Since the East Matsumoto Basin fault is located to the north of the Gofukuji fault, the recurrence behavior and slip per event are significant to estimate the past multi-segment earthquakes on the fault system. To address these issues, we conducted detailed mapping of the faults based on the 2-m-DEMs interpretation, trench, borehole and shallow seismic reflection surveys. As a result, we reconstructed possible three slips per event during the last 9000 years at the Aizome site on the northern section of the East Matsumoto Basin faults. The reconstructed vertical slip is 1.8 m as the average value for the last three events. The 1.8-m-slip is converted to be 3.6-4.3 m as dip slip component, because the dip of the fault across the geologic section is measured at 25-30 degreee to the east. Judging from the amount of slip per event, the size of the earthquake is empirically estimated at M7.6. Meanwhile, based on the relationship between length of the East Matsumoto Basin faults and the size of the earthquake, the magnitude of earthquake is estimated at M7.0. This discrepancy of the estimated magnitude means that the most recent three earthquakes did not rupture only the East Matsumoto Basin faults as single segment earthquakes but ruptured in tandem with adjacent faults. Thus, the reconstruction of slip per event during individual paleoseismic events is essential to reveal the spatial extent of past earthquakes, hence, paleoearthquake scenario can be reconstructed based on densely populated actual slip per event data.

Keywords: active fault, paleoseismology, ISTL active fault system, East Matsumoto Basin faults, coseismic slip