

## Estimation of earthquake magnitudes on the ISTL active fault zone based on distributions of average slip rates

Yasuhiro Suzuki<sup>1\*</sup>, Nobuhiko Sugito<sup>1</sup>, Hiroshi Sawa<sup>2</sup>, Mitsuhsa Watanabe<sup>3</sup>,  
Nobuhisa Matsuta<sup>1</sup>, Daisuke Hirouchi<sup>4</sup>, Kaoru Taniguchi<sup>5</sup>, Masayoshi Tajikara<sup>6</sup>,  
Satoshi Ishiguro<sup>1</sup>, Takashi Kumamoto<sup>7</sup>, Research Group for ISTL Tectonic Landforms<sup>1</sup>

<sup>1</sup>Nagoya University, <sup>2</sup>Tsuruoka National College of Technology, <sup>3</sup>Toyo University, <sup>4</sup>Shinshu University,

<sup>5</sup>Active Fault and Earthquake Research Cen, <sup>6</sup>Association for the Development of Earth, <sup>7</sup>Okayama University

The amount of vertical or lateral offset obtained from tectonic landforms is one of the most essential data for understanding fault behaviors. However, previous studies have mainly focused on the most excellent sites in active fault zones, which might have resulted in poor understanding of spatial variations of the offset amounts along the fault zones. We have conducted tectonic-geomorphological investigations to contribute to the integrated research project for the Itoigawa-Shizuoka Tectonic Line fault zone sponsored by MEXT, Japan (2005-2009), for proposing a spatially dense-and-precise GIS-based data set that includes active fault distributions, amounts of vertical and lateral offset at each site, and distributions and ages of geomorphic surfaces along the ISTL active fault zone. Based on the data set, we have inferred average slip rate distributions, and then estimated distributions of net slip rates, coseismic net slip distributions and moment magnitudes ( $M_w$ ) associated with large earthquakes from the fault zone, in addition possible locations of subsurface asperities. We have proposed the following two method to estimate  $M_w$ .

(1) Estimation of  $M_w$  based on distributions of net slip rates and coseismic net slip amounts at at least one site(s)

(2) Estimation of earthquake moment accumulated during a certain periods based on distributions of net slip rates

We conducted the method (1) for the northern part of the ISTL (Hakuba-Matsumoto) (Suzuki and Sugito, 2008; Suzuki et al., submitted). We present here the method (2).

We firstly divided the ISTL active fault zone into six parts based mainly on fault trace geometries, and determined fault strikes, dips, and rake angles. And then, we calculated earthquake moments accumulated during 1000 years, which were converted into  $M_w$ . The resultant values of  $M_w$  were 7.13, 7.15, 7.23, 7.26, 6.74, and 7.32 from north to south for the six parts of the fault zone.

Suzuki, Y., and N. Sugito, 2008, Abstract of Japan Geoscience Union Meeting 2008, J237-003.

Suzuki, Y. et al., Active Fault Research (in Japanese with English abstract), submitted.

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