

Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

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MIS036-P105

Room:Convention Hall

Time:May 27 14:15-16:15

Tectonic setting of coseismic surface rupture associated with the 2011 Iwaki earthquake (M7.0)

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M 7.0 intraplate normal fault earthquake occurred on April 11, 2011 near Iwaki city, Fukushima Prefecture. Based on basic field reconnaissance from April 12 to 15, we recognized coseismic surface ruptures, presumably associated with the main shock. Coseismic surface ruptures extend NNW for about 11 km in a right-stepping en echelon manner. Geomorphic expressions of these ruptures commonly include WWS-facing normal fault scarps and/or drape fold scarp with open cracks on their crests, on the hanging wall sides of steeply west-dipping normal fault planes subparallel to Cretaceous metamorphic rocks. Highest topographic scarp height is about 2.3 m. Both right-stepping en echelon patterns of the fault scarps or open cracks and striations observed at several outcrops suggest left lateral components of slip, though much smaller than vertical components of slip estimated by topographic relief of coseismic fault scarps. This normal fault earthquake is in contrast to compressional stress regime in Tohoku region and may reflect enhanced extensional stress on the hangingwall block induced by M⁹ earthquake.