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Source fault model of Northern Honshu, Japan

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Constructing source fault model is significant for estimation of strong ground motion and evaluation of crustal activity, including seismicity and crustal deformation. Surface ruptures and crustal deformation associated with large earthquakes produces tectonic geomorphology and geologic structure. Thus, using active fault and fold data, we can estimated seismogenic source faults. However, in some cases, no surface ruptures are observed associated with large earthquakes. Particularly, in the fold-and-thrust belt of Northern Honshu, the existence of shallow detachment in the Neogene post rift mudstone, makes the relationship between deep sited seismogenic source fault and near surface active fault complicated due to thin-skinned deformation processes. Present days geologic structure is strongly controlled by old geologic structure. In case of Northern Honshu, Miocene rifting associated with the opening of the sea of Japan, strongly controlled the geometry of sesimogenic source fault. It is indicative by the recent result of the deep seismic profiling in the Niigata area and investigation of source fault associated with the 2003 Northern Miyagi earthquake. For constructing a source fault model, an integrated, multi-deciplinary approach is needed, including geologic and crustal architecture and seismicity. Here, we examined the active fault data, with geologic structure, gravity anomaly data, seismicity and constructed rectangular fault models in Northern Honshu. It is a first attempted to provide regional models by integrated way of approach. It is a very first version and it will be updated by the increased information in the future.