



High-resolution seismic profiles of the active wedge thrusts in the Toyama basin, central Japan

Naoko Kato, Hiroshi Sato, and Tatsuya Ishiyama

Earthquake Research Institute, Univ. of Tokyo, Tokyo, Japan (naoko@eri.u-tokyo.ac.jp)

Thick-Neogene sediments accumulated in the Toyama basin, Miocene failed rift formed in the opening stage of the Sea of Japan. Due to the shortening deformation since the Pliocene, NE-trending reverse faults and folds have been developed to form active fault systems. Evaluation of seismic hazards requires understanding the relationship between active fault and seismic source fault is important. To obtain complete image of the active seismogenic source fault system, we carried out the high-resolution seismic profiling across the active faults in the Toyama basin, together with the deep seismic reflection profiling (KT01: Ishiyama et al., 2016). Seismic data were acquired using two vibrator trucks (IVI, EnviroVib) and a Mini-vib (IVI T15000). Shot and receiver intervals are 10 and 12.5 m respectively. The seismic data were processed using conventional CMP-reflection methods. The obtained seismic sections across the Takashozu and Isurugi faults portrays the growth strata associated with the Plio-Quaternary reverse faulting. The seismic sections show that both structures are formed as wedge thrusts at shallower structural levels. P-wave velocity profiles obtained by refraction tomography accords well to the geologic interpretation as a wedge thrust. The depth of thrust tip of main thrust is 0.6 km to 1.5 km and located in the syn rift Miocene mudstone. As the main anticline was formed by the deep-seated thrust, this shallow thrust played a secondary role for this anticline. Our results demonstrate that high-resolution seismic profiles help to reveal source fault geometry and their activity.