

Multidisciplinary Seismic Survey across the Kitakami Lowland, Northeast Japan

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The deep geometry of active faults and the mid-crustal detachment at the base of seismogenic layer is important for understanding active tectonic process and accessing the risk of destructive earthquakes. To investigate the deeper extension of active faults within the seismogenic layer, we conducted a seismic reflection profiling experiment across the western marginal faults of Kitakami lowland, northeast Japan. The combination of telemetry and independent recording system has provided the deployment of wide-angle survey line with dense seismic array. The simultaneous data acquisition of regional refraction, low-fold wide-angle reflection and dense reflection survey has been optimized by the integration of vibrator source focused on effective low-frequency bandwidth of sweep signal and the three-component digital sensors with broader frequency responses. The seismic profile demonstrates the potential capabilities of wide-angle acquisition scheme with three-component digital sensors for deep seismic imaging of crustal structure. The images of the deeper extension of active faults estimated through CMP stacked profiles using digital sensors and conventional 4.5Hz/10Hz geophones will be compared.