

## Deep seismic profiling of Metropolitan areas : preliminary results of the eastern Kanto Mountains 2003

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The Headquarters for Earthquake Research Promotion Japan determined to start the new program targeting the reduction of seismic hazard in the metropolitan areas. As a part of this program, the project to reveal the regional characterization of metropolitan area, including the deep seismic profiling, began from 2002 as a basically five years' project. A long-term goal is to produce a map of reliable estimations of strong ground motion. This requires accurate determination of: source, propagation path, ground motion response. This projects focuses on identification and geometry of: source faults, subducting plates and mega-thrust faults, crustal structure, seismogenic zone, sedimentary basins, 3D velocity properties. Reconstruction of source fault and velocity models allow for more realistic 3D EQ wave simulations. All of these information will be synthesized and provided to communities involved in probabilistic hazards analysis, risk assessment and societal response. In 2002-3, deep seismic profiling was carried out along the Boso peninsula, the Sagami and Tokyo bays. The target of the experiments was the imaging of upper surface of the Philippine Sea plate and its spray faults. The obtained profiles provide the deep image of the upper surface of the Philippine Sea plate and splay faults.

The deep seismic profiling across the eastern part of the Kanto Mountains was carried out from October to December, 2003. The length of the seismic line is 140 km. The northern and southern part, CMP-seismic data was obtained using four vibroseis trucks and digital-telemetry cable system. The receiver interval was 50 m and nominal shot interval was 100 m. In the mountain part, middle of the seismic line, the off-line recorders were deployed with 50 m of receiver interval. In this part to obtained a low-fold stacked section by CMP-method, shot interval was designed to be several hundred meters. The refraction and wide-angle reflection experiment using high energy sources; dynamite (300 and 100 kg) and many sweeps (ca.100) by four vibroseis trucks. The seismic signals by explosive sources at 9 locations were recorded by total 2768 channels and by 560 or 1288 channels for vibroseis. In Boso 2002, the image of the toe portion of subduction mega thrust was obtained using four vibroseis trucks. and deeper portion were obtained by low-fold reflection profiling method using total 2,500 channels and 12 explosive sources.

The seismic data obtained from northern part of the seismic line from Kiryu to Fukaya was processed by standard CMP-method. The stacked, post-migrated and depth converted seismic section clearly demonstrates the whole basin structure of the north-western part of the Kano basin. Based on the pattern of reflectors the basin has thick syn-rift Neogene (probably Miocene) sediments. The basin fill shows asymmetric shape, and interpreted as a basin fill of half-graben. Judging from the surface geology, the master fault which produce the Miocene graben is probably the deeper extension of the north-dipping Median Tectonic Line. The deeper extension of the north-western Kanto basin active fault system probably merge to the master fault. The maximum thickness of the basin fill is 3 km. The seismic data obtained from central to southern part of the seismic line is under processing. Below the northern part of the Kanto Mountains, reflection from middle to lower crust (4-7 seconds TWT) was clearly recognized.