

DEEP SEISMIC PROFILING OF METROPOLITAN AREAS IN JAPAN FOR STRONG GROUND MOTION EVALUATION: THE SHINGU-MAIDURU LINE

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A program was started by the Headquarters for Earthquake Research Promotion Japan in 2002 for the purpose of the reduction of seismic hazard in the metropolitan areas. As a part of this program, deep seismic profiling, was began in order to reveal the regional characterization of metropolitan areas, from 2002 as a five-year project. The final goal of the project is to produce a map of more reliable estimation of strong ground motions in the Tokyo and Osaka areas. The surveys required for this project are accurate determinations of a source, a propagation path and a site response for earthquakes. More specifically, purposes of the surveys are to determine the accurate positions and geometry of source faults, subducting plates and mega-thrust faults, crustal structure, seismogenic zone, sedimentary basins, 3D velocity structures. Reconstructions of source fault and velocity models leads to more realistic 3D estimation of strong motion seismic waves. The surveys were conducted in the fiscal year of 2002-2003, in the Kanto area. Deep seismic profiling was extensively carried out along the 4 lines. In the fiscal year of 2004, the survey area was shifted to the Kinki area. Surveys along two measure lines, Osaka-Suzuka (E-W) and Shingu-Maiduru (N-S) lines were conducted by ERI, Univ. of Tokyo and DPRI, Kyoto Univ. This is a very preliminary report for the Shingu-Maiduru (N-S) line of about 240km. In the profile, 15 shots (100-700kg) of dynamite and 3 multivibrator (several hundreds) with 4 vibroseis trucks were used for refraction and wide-angle reflection surveys. More than 2000 seismometer stations were set at intervals of 50-100m all along the line. Clear first arrivals and reflections from the Philippine Sea plate and reflectors in the crust were obtained at almost of the stations. The reflection from the Philippine Sea plate are very clear beneath Kii Peninsula and are still visible under the northern Kinki district at about 50-70km. A reflection survey was also carried out across the Arima-Takatuki Tectonic Line. The survey line is about 30km long and graben-like structure of the fault was clearly revealed. The data analyses are still on-going.