

DEEP SEISMIC PROFILING OF METROPOLITAN AREAS IN JAPAN FOR STRONG GROUND MOTION EVALUATION: PRELIMINARY RESULTS OF BOSO 2002

Hiroshi Sato[1], Naoshi Hirata[1], Tanio Ito[2], Takaya Iwasaki[3], Kazuki Koketsu[4], Keiji Kasahara[5], Kiyoshi Ito[6], David Okaya[7], Steven Harder[8], Kate Miller[9], Takeshi Ikawa[10], Yoichi Ohta[10]

[1] ERI, Univ. Tokyo, [2] Dept. Earth Sciences, Fac. Sci., Chiba Univ., [3] ERI, Tokyo Univ., [4] Earthq. Res. Inst., Univ. Tokyo, [5] N.I.E.D., [6] Disas. Prev. Res. Inst, Kyoto Univ., [7] Dept. Earth Sci., Univ. of Southern California, [8] Dept. Geol. Sci., UTEP, [9] UTEP, [10] JGI

<http://www.eri.u-tokyo.ac.jp/daidai/index.html>

The metropolitan areas in Japan, such as Tokyo and Osaka, have high risk of seismic hazards. For example, if present Tokyo is attacked by the great earthquake same as Kanto earthquake of 1923 (M7.9), the most pessimistic estimation of the economic loss reaches to 1 - 3 trillion USD. 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 the fiscal year of 2002, deep seismic profiling was carried out along the Boso peninsula. In Boso 2002, the image of the toe portion of subduction mega thrust was obtained using four vibroseis trucks and air-guns, and deeper portion were obtained by low-fold reflection profiling method using total 2,500 channels and 12 explosive sources (100 kg to 200 kg). The obtained image clearly demonstrates the upper surface of the Philippine Sea plate.