

Improvement on the Fault Model of Miyagi Earthquake for Hazard Maps

Toru Ishii[1], Hiroyuki Fujiwara[1], Toshimi Satoh[2], Toshiaki Sato[3], Motofumi Watanabe[4]

[1] NIED, [2] Izumi Research Institute, Shimizu Corp., [3] Ohsaki Research Institute, [4] ORI

A methodology to evaluate spatial strong-motion distributions is studied in order to make hazard maps for scenario earthquakes in Japan. A hazard map for scenario earthquake represents a spatial strong-motion distribution in an area that will be caused by a specified future earthquake. Heterogeneous fault models of possible earthquakes are established by considering asperities in which slips and stress drops are larger than those in the background area on the fault plane. Three-dimensional propagation characteristics of seismic waves and amplifications in surface layer are estimated based on detailed information and data collected in the mapping area. The strong-motion time histories, peak ground motions and seismic intensities are evaluated. The developed procedure and techniques are applied to Miyagi-ken-oki earthquake, one of the most active inter-plate large earthquakes along the Pacific coast of northeast Japan. It is confirmed that the results of this study by using the improved fault model explain very well the recorded time histories at three stations around Sendai during 1978 Miyagi-ken-oki earthquake.