



An Outline of the Special Project for Earthquake Disaster Mitigation in the Tokyo Metropolitan Area - subproject I: Characterization of the plate structure and source faults in and around the Tokyo Metropolitan area

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Large earthquakes in Kanto



Hdqrs. of Earthq. Res. Promotion



Cabinet office

Assumed earthquake (M7.3)

jma intensity



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- Probability of a M7-class earthquake within 30 years in Kanto is about 70%
- Assumed fatality: 11,000
 Economic losses: JPY 112 trillions

These were estimated although information on M7-class earthquakes was unclear.

Special Project for Earthquake Disaster Mitigation in the Tokyo Metropolitan Area

Project outline

Project ①: Plate structure

MeSo-net, dense seismic network (400 points)
Controlled earthquakegeneration experiments



Cooperation, Collaboration, Coalition





Project ③: Real-time disaster prevention system

Project 2: Earthquake resistance

Real-time strong motionInformation sharing system

E-Defense

Engineering

March 16, 2010

 Characterization of the plate structure and source faults in and around the Tokyo Metropolitan area



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Expected results



Plate structure (P-wave velocity)







Zoom into Tokyo

Not enough



MeSO-net

Challenge

Ambient noise Sedimentary layer

Noise reduction

Boreholes: Depth 20km Many observatories: 400

School-yard observation

Everywhere

Relatively quiet

Outreach program of science education Inspiring future seismologists!



MeSO-net

Data acquiring

Assuredness rather than real-time operation

Data retention at the time of disaster

• Operation

Automatic monitoring of observatory status

Easy installation and uninstallation
 No specific technique



Data collection, process, exchange, and academy pack



March 16, 2010

Installation

- Seismometer installed at the bottom of a 20m-depth borehole
- Device box on the surface













March 16, 2010

6, 2010

Observatory W048 Gohongi Elementary School





First installation of a seismometer in MeSO-net

Demonstration: Sensor check by a pupil

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Island in Tokyo Bay





Configuration

249 stations



Seismicity in 9 months (M>=2.0)



Difference in waveform between depths at ERI



080215.004519 M3.4 D42km Off Ibaraki



Noise amplitude spectra at ERI





2009/07/12 Tokurozawa M3.0 D57km

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#### 2009/09/30 off Samoan islands (D18km Mw8.0(USGS)): Tsukuba-Fujisawa survey line

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Off Samoan islands(D=18km, Mw8.0(USGS)) Running spectra



Amplitudes of long-term ground motions





Dominant frequency a, 0.33Hz

(wave length 12km)

b, 1Hz (wave length 4km)

c, 4Hz

March 16, 2010

(wave length 1km)



Similarity in seismic intensity







Summary

- Our project is in very good progress!
 - 249 seismic stations have been installed so far.
 - Observation is becoming ready to contribute to earthquake disaster mitigation in the Tokyo Metropolitan area
 - Provide really realistic ground motions
 - Provide basic data for applied engineering and socialscience







End

March 16, 2010





March 16, 2010

The 3rd 関東・地震の地殻変動による海岸段丘(房総半島南端)

Expected results



Plate structure (P-wave velocity)

