

## Evaluation of 3D subsurface structural model of Sendai plain by using ground-motion simulation and receiver function

# Takeshi Kurose[1]; Shinichi Akiyama[1]; Yasushi Ikegami[2]; Hiroyuki Fujiwara[3]

[1] CTC; [2] ERI, Tokyo Univ.  
CTC; [3] NIED

We performed earthquake ground-motion simulation using 3D subsurface structural model of Sendai plain, northeastern Japan, constructed by National Research Institute for Earth Science and Disaster Prevention (NIED) for an M 4.2 earthquake which occurred southeast off Miyagi Pref. on Apr. 4, 2004. Then, we picked up sites where observed waveform was not well reproduced by the simulation, and performed receiver function inversion by using earthquake records observed at the selected sites in order to evaluate the subsurface structural model used in the simulation.

At the sites of MYG004 (Tsukidate) and MYG006 (Furukawa), the observed waveforms showed larger amplitude for a longer time than those at the other sites. This is considered to be because of amplification of seismic wave by deep sedimentary layers. However, the simulation could not reproduce this remarkable ground-motion at these sites, and resulted in smaller amplitude.

Then, we performed a receiver function inversion at these 2 sites, which showed that the seismic basement is deeper than the model by NIED with thicker sedimentary layers. Thick sediments are one of the chief factors that account for seismic wave amplification. Therefore, this inversion result can explain, at least quantitatively, the characteristic large amplitude with a long duration in the observed waveforms.

However, further consideration is needed about subsurface structural model in Sendai plain. For this purpose, we have to modify the 3D subsurface structural model by using the 1D velocity profiles estimated by receiver function inversions, and confirm that waveform reproducibility becomes higher by ground-motion simulation using the modified 3D model.