

Simulation of reflected tsunami wave caused by the three cases of earthquake off Fukushima prefecture

*Kenji Nakata¹, Takeyasu Yamamoto¹

1. Meteorological Research Institute, Japan Meteorological Agency

A tsunami, which was generated by the earthquake off Fukushima, was reflected on the coast of Fukushima Prefecture and propagated toward Sendai Bay, so 1.4 m height of tsunami was observed at the Sendai New Port on November 22, 2016.

In this study, we investigated similar phenomena that high reflected tsunamis were observed. We firstly searched the similar phenomena in tsunami cases occurred east off Tohoku and Kanto districts, the following three cases were detected:

July 19, 2008 (Mw 6.9),

July 12, 2014 (Mw 6.5),

December 20, 2008 (Mw 6.4).

Next, we executed tsunami simulations to reproduce these observed tsunami waveforms. For reproduction, we study accurate wave sources, propagation processes including dispersibility, and observation points including resolution of surrounding terrain.

The analysis showed that both the first wave and the reflected wave were reproduced for the cases of July 2008 and July 2014, whereas the calculated amplitude of the reflected wave was smaller than the observed one in the case of December 2008.

In the case of July 2008, shifting the horizontal position of the optimal fault by 0.2 degrees changes the amplitude ratio between the direct wave and the reflected wave, and changes the appearance of the predicted waveform.

Keywords: tsunami, reflected wave