Analysis of the tsunami generated by the 2006 great Kurile earthquake (Mw 8.2)

Y. Tanioka (1) and Y. Hasegawa (2)

(1) Institute of Seismology and Volcanology, Hokkaido University, Japan, (2) Meteorological Research Institute, JMA, Japan (tanioka@mail.sci.hokudai.ac.jp / Phone: +81-11-706-2640)

A great earthquake, Ms 7.9 occurred off Simushir Island along the Kurile trench on November 15, 2006. The earthquake generated a tsunami which observed at the many tide gauges along the Pacific coast in Japan, Russia, and USA. No damage caused by the tsunami was reported in Japan, but some damages were reported at Crescent City in USA. The most significant phenomenon of this tsunami in Japan was large later phases observed about 7-10 hours after the origin time of the earthquake. The tsunami was first arrived at the tide gauges in Japan about 2-4 hours after the origin time of the earthquake. In this study, we first numerically computed tsunami, compared the observed and computed tsunami waveforms at three tide gauges in Japan, and estimated the seismic moment of the earthquake. We also try to discuss the generation mechanism of the large later phases observed in the Japanese tide gauges.

The trust type fault plane (strike 225 degree, dip 40 degree, rake 94 degree) was used for the tsunami computation. The length and width of the fault model were 200km and 100km, respectively. The three observed tsunami waveforms observed at three tide gauges, Hanasaki, Miyako, and Chchijima, were used to estimate the slip amount of the earthquake. By comparing the observed and computed tsunami waveforms, we estimated the slip amount is 4.3 m. By assuming the rigidity of 4 x 10**21 Nm/s**2, the seismic moment is calculated to be 3.4 x 10**21 Nm (Mw8.3). This estimated seismic moment is consistent with that shown in the Harvard CMT catalog. This implies that the excitations of seismic waves and tsunamis are consistent with each other. The preliminary analysis of the computed tsunami indicated that the large later phase observed in Japan can be caused by the reflection of the tsunami at the shallow region near Emperor Seamounts.