

The later phase of the tsunami of the Nemuro-Hanto-Oki Earthquake of July 17, 1973

Yuichi Namegaya[1], Yoshinobu Tsuji[1]

[1] ERI, Univ. Tokyo

A large earthquake (M 7.4) occurred in the sea region eastern off Nemuro peninsula, Hokkaido on 17 June 1973 and was accompanied with a small tsunami. Tidal stations on the Pacific coasts in east of the Japanese Islands recorded the tsunami. The tsunami height of more than 150 [cm] was recorded at Hanasaki, Nemuro city.

On the tsunami records at the several stations on the Pacific coasts of Hokkaido and the north part of Honshu, an obvious later phase waves were recorded independently at 2 to 2.5 hours after the arrival of the initial wave. The later phase waves appeared in such way that after the initial wave train was once attenuated, suddenly another eminent train of the later phase waves appeared. At several stations the wave height of the later phase exceeded the initial one. In order to clarify the reason why such an eminent phase waves appear about 2 hours later than the arrival of the initial wave, we made a numerical calculation of the propagation of the tsunami.

We assumed the length, width of the fault to be 100 [km] and 100 [km]. The dip angle and the amount of dislocation were assumed to be 27 [deg] and 0.96 [m]. In addition, we use the calculation grid of the spherical coordinate system with the intervals of 1 [min] both in EW and NS directions. The influence of the rotation of the earth and the fluid viscosity were neglected. We introduced bottom friction of the amount to be 0.05 to 0.1, for giving the equivalent energy dissipation to the effect of the reflection of the waves at the coastline. The calculated time length was 6 hours with using the leap frog method, and time interval of one step was 1.5 [second].

We found out that a large reflective wave was generated on the southern coast line of Kunashiri Island and it reached the Pacific coasts of Hokkaido and North Honshu about 2.5 hours later after the arrival of the initial wave train, and it is supposed to be the later phase wave train.