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Construction of tsunami prediction system using tsunami amplification

TAKAHASHI, Narumi[1*] ; ISHIBASHI, Masanobu[1] ; NAKAMURA, Takeshi[1] ; BABA, Toshitaka[2] ; KANEDA, Yoshiyuki[3]

[1]Japan Agency for Marine-Earth Science and Technology, [2]University of Tokushima, [3]Nagoya University

In the Nankai Trough area, possibility of huge earthquake with over M9 is pointed out. Therefore, local governments along the area revised estimation of many types of damages and planed action for the disaster prevention. The coastal area near the rupture zone, however, receives heavy tsunami within a few minutes according to Cabinet office of Japanese government. To take actions against severe situation, Japan Agency for Marine-Earth Science and Technology (JAMSTEC) constructed a tsunami immediate prediction system using dense ocean floor network system for earthquakes and tsunamis (DONET) based on concept of tsunami amplification.

Tsunami height strongly depends on the topography during tsunami preparation because the tsunami speed is expressed by a function of water bottom. Therefore, JAMSTEC had investigated the possibility for use of tsunami amplification for the tsunami prediction (Baba et al., 2013). With assurance of fault models, we calculated theoretical tsunami waveform for twenty DONET stations and targets of the coastal cities and got each maximum tsunami height. We selected Kushimoto town, Owase city, and Omaezaki city as first step of the system construction and constructed tsunami database including their tsunami waveforms and inundation maps. This system detects first arrivals of earthquake and tsunami using real-time DONET data, calculated average of absolute observed pressure values for twenty DONET stations, constructed a correlation profile between the average values and maximum tsunami height of each city, and select fault models changing the average values from the correlation profile. We introduce theoretical pressure waveform of the 1944 Tonankai earthquake and have considered method to make reduce the error of predicted tsunami height by this system. As a result, we found that it is important to select stations used for this system and fault models based on directions of detected events. In this presentation, we report concept of the tsunami immediate prediction system and future plan of the revise.

Keywords: tsunami amplification, immediate prediction, DONET, Nankai Trough