Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

SSS30-P10 Room:Poster Time:April 29 18:15-19:30

Tsunami simulation in the Western Pacific Ocean and East China Sea from the hypothetical M9 Nankai earthquake models

HARADA, Tomoya[1*] ; SATAKE, Kenji[2] ; FURUMURA, Takashi[1]

[1]CIDIR/ERI, the University of Tokyo, [2]Earthquake Research Institute, the University of Tokyo

We computed tsunamis in the Western Pacific Ocean and East China Sea from the hypothetical models of the giant Nankai earthquake proposed by the Cabinet Office of Japanese government (2012). The maximum tsunami heights on the New Guinea coasts, Philippine Islands coasts, and Shanghai coasts in China are about 1.0-5.0 meters, 1.0-7.0 meters, and 0.5-2.0 meters, respectively. They are up to twice large as those computed from the 1707 Hoei earthquake (the largest earthquake along the Nankai trough in Japanese history). The simulation also shows that tsunami heights on the coasts in this area depend on the slip amounts on the Nankai fault.

Responding to the unexpected occurrence of the 2011 Tohoku earthquake, the Cabinet Office of Japanese government (2012) assumed 11 models of the giant Nanakai earthquake (Mw 9.1), computed tsunami heights along the Japanese coasts, and estimated the human and economic disasters. The tsunami heights exceed 10 m on the coasts of 13 prefectures, with a maximum height of 34.4 m.

Tsunamis from such a gigantic earthquake may impact the coasts in the Western Pacific Ocean and East China Sea. Harada and Satake (2012, AOGS; 2013, "Tsunami Events and Lessons Learned", Springer) performed numerical tsunami simulations in these oceans by using various fault models of the past Tokai and Nankai earthquakes.

In this study, we carried out the same simulations from the 11 fault models of the M9 Nankai earthquake. Tsunami propagations were computed by the finite-difference method for the non-linear long-wave equations with Corioli's force (Satake, 1995) in the area of 115-155 deg. E and 8 deg. S to 40 deg. N using the GEBCO 30-second bathymetry data. Initial tsunami heights computed by the Cabinet Office were used. A Manning's roughness coefficient of 0.025 $m^{-1/3}s$ was assumed for the friction and a computation time step of 1 s is used to satisfy the stability condition of the finite-difference method. We simulated tsunamis for 24 hours after the earthquakes.

We thank the Cabinet Office of Japanese government for providing the hypothetical models of the giant Nankai earthquake.

Keywords: sunami numerical simulation, Western Pacific Ocean, East China Sea, maximum tsunami heights, hypothetical M9 Nankai earthquake