

Numerical Evaluation of Tsunami Wave Hazards in Harbors along the South China Sea

Jing, H. H.⁽¹⁾, Zhang, H.⁽¹⁾, Yuen, D. A.^(1,2,3) and Shi, Y.⁽¹⁾

(1) Laboratory of Computational Geodynamics, Graduate University of Chinese Academy of Sciences, Beijing, 100049, China P. R.

(2) Department of Geology and Geophysics, University of Minnesota, Twin Cities, MN 55455-0219, USA

(3) Minnesota Supercomputing Institute, University of Minnesota, Minneapolis, MN 55455, USA

Previous study suggested that potential great earthquakes at the Manila trench may produce significant threat to Chinese South China Sea coast. The harbors along South China Sea are embarking upon improvement programs to take measures to prevent wave hazards. We proposed a numerical model which base on Shallow- Water Equation to simulate the behaviors of the waves in these harbors. Numerical computing is conducted to investigate the security of the harbor and then to propose tactics of improvements. Animations made from simulation results exhibit refraction, diffraction and interference phenomena from the waves. Furthermore, by analyzing the time series data of water surface elevation variations with time at the track recorded points, we can estimate of the wave hazards in coastal area caused by tsunami waves with a height of couple meters.

Key words: numerical simulation, wave hazards, South China Sea