

Evaluation of the relationship between maximum tsunami heights and fault parameters in Korea

Min-Jong Song*, Chang Hee Kim**, Yong-Sik Cho***

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Abstract

Tsunamis triggered by undersea earthquakes have the characteristic of longer wavelengths and can propagate a very long distance. Although the occurrence frequency of tsunami is low, it can cause casualties and properties. Historically, tsunamis that occurred on the western coast of Japan attacked the eastern coast of the Korean Peninsula and damaged the property and the loss of human life in 1983 and 1993. By tsunami in 1983 especially, 2 people were killed, and more than 200 casualties occurred. In addition, it caused 2 million dollars in property damage at Imwon Port. In 2011, The eastern cities of Japan: Iwate, Miyagi, Ibaraki, and Fukushima were damaged by a tsunami that occurred near onshore along the Pacific ocean and caused more than 300 billion dollars in property damage, and 20,000 casualties occurred. Moreover, those provoked nuclear power plant meltdown at Fukushima. In this study, it was carried out a relationship between maximum tsunami heights and fault parameters of earthquake: strike angle, dip angle, and slip angle at Imwon port. Those fault parameters are known that it does not relate to the magnitude of earthquake directly. Virtual tsunamis, which could be triggered by probable undersea earthquakes in the future, were investigated and mutual information based on probability and information theory was introduced to figure out the relationship between maximum tsunami height and fault parameters. Fault parameters were evaluated according to the strong relationship with maximum tsunami heights finally.

Keywords : Tsunamis, Maximum tsunami heights, Fault parameters, Mutual information

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* Ph.D student, Dept. of Civil and Environ Eng., Hanyang University · E-mail : thdcnd3517@gmail.com

** Chief, Research institute, Joong-ang Disaster Prevention Engineering Co.,Ltd.

*** Professor, Dept. of Civil and Environ Eng., Hanyang University