Numerical Simulation of Tsunami Waves Forces on Coastal Structures

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Abstract

The main aim of the present paper is numerical investigation of the tsunami wave forces on coastal structures using the commercial software FLOW-3D. Verifications of the simulation results using experimental data and empirical formula showed that the present numerical model is capable of modeling the aforesaid problem with good accuracy. Several numerical simulations have been conducted in the framework of this work to study different parameters affecting the forces induced by tsunami waves on coastal structures. Four empirical equations have been introduced to estimate nonbreaking tsunami wave forces on coastal structures. Based on our results, quantity of exerted forces by breaking waves over curved structures and gradient structures with 45 degree was 20 and 35 percent of exerted forces over caisson structures, respectively.