

NUMERICAL SIMULATION OF OVERTOPPING OF SLOPING BREAKWATER UNDER IRREGULAR WAVE

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Abstract: Based on the open source software OpenFOAM, a three-dimensional wave model is developed to generate irregular waves. The Volume-Averaged RANS equation and the seepage equation containing nonlinear term are used to describe the water flow under the armour layer of the sloping breakwater. The full-scale simulation of the accropode blocks as armour layer of sloping breakwater is realized through mesh generation tool. The interaction between the normally-incident irregular waves and the sloping breakwater armored by accropode blocks is investigated through numerical simulation. The results indicate reasonably good agreement both between the simulated mean overtopping rates and physical model results and between the simulated overtopping rates for full-size prototype breakwater and the prototype results converted from the model test based on the gravity similarity. It is concluded that the developed numerical model can be used to describe the overtopping process of sloping breakwater armored by accropode blocks under working conditions.

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