

3-D Simulation on the Sever Local Scour Induced by Tsunamis

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Abstract

A tsunami may result in severe local scour and causes heavy damages on structures in the coastal area. In this study, a 3D multi-phase rheological model that incorporates the quadratic Bingham model is developed to simulate the local scour problems. A quadratic term is added to the traditional Bingham model to represent the effect of sediment collision. We carefully validated the model with an analytical. Very high consistency can be seen in terms of the velocity profile and location between the shear zone and plug zone. This model is then used to study the local scour problem in the laboratory. We conclude that the newly developed quadratic Bingham model is capable of simulating the complex local scour and mud slide problems.