

A New Numerical Model for Propagation of Tsunami Waves

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Abstract: A new model for propagation of long waves including the coastal area is introduced. This model considers only the motion of the surface of the sea under the condition of preservation of mass and the sea floor is inserted into the model as an obstacle to the motion. Thus we obtain a constrained hyperbolic free-boundary problem which is then solved numerically by a minimizing method called *the discrete Morse semi-flow*. The results of the computation in 1D show the adequacy of the proposed model.

Keywords: long waves; nonlinear hyperbolic equation; volume constraint; free boundary; variational method; discrete Morse semi-flow; FEM;

AMS Subject Classification: 35L70; 47J30; 58E50; 76B15; 74J15; 35R35;

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