Modeling and Simulation of Tsunami Waves Using Virtual Reality

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Tsunami disaster occur oftenly in the various parts of the world such as Smatora Island in 2004 and East Japan in 2011. Tsunami kills many human beings and damages economic activities seriously. It is very important to develop useful modeling and simulation methods for Tsunami waves in order to perform the planning and design for the community development and the prevention of disaster

We propose stabilized finite element methods for the shallow water equation, Boussinesq equation and Navier-Stokes equation. The computed results obtained by the present methods have been compared with the exiting experimental and other numerical results. An evacuation analysis is performed to predict the damage to human living. We also propose a pre- and post-processing system based on virtual reality technique to make the overall computational tool set a high-quality simulation environment.

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