Numerical Simulation of Dam Breaking Using Smoothed Particle Hydrodynamics and Viscosity Behavior (PDF)

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Title: Numerical Simulation of Dam Breaking Using Smoothed Particle Hydrodynamics and Viscosity Behavior

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摘要: Smoothed particle hydrodynamics (SPH) is a Lagrangian meshless particle method. It is one of the best method for simulating violent free surface flows in fluids and solving large fluid deformations. Dam breaking is a typical example of these problems. The basis of SPH was reviewed, including some techniques for governing equation resolution, such as the stepping method and the boundary handling method. Then numerical results of a dam breaking simulation were discussed, and the benefits of concepts like artificial viscosity and position correction were analyzed in detail. When compared with dam breaking simulated by the volume of fluid (VOF) method, the wave profile generated by SPH had good agreement, but the pressure had only reasonable agreement. Improving pressure results is clearly an important next step for research.

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