

Nonlinear Free Surface Flow Simulations Using Smoothed Particle Hydrodynamics

Authors : Abdelraheem M. Aly, Minh Tuan Nguyen, Sang-Wook Lee

Abstract : The incompressible smoothed particle hydrodynamics (ISPH) is used to simulate impact free surface flows. In the ISPH, pressure is evaluated by solving pressure Poisson equation using a semi-implicit algorithm based on the projection method. The current ISPH method is applied to simulate dam break flow over an inclined plane with different inclination angles. The effects of inclination angle in the velocity of wave front and pressure distribution is discussed. The impact of circular cylinder over water in tank has also been simulated using ISPH method. The computed pressures on the solid boundaries is studied and compared with the experimental results.

Keywords : incompressible smoothed particle hydrodynamics, free surface flow, inclined plane, water entry impact

Conference Title : ICCFD 2015 : International Conference on Computational Fluid Dynamics

Conference Location : Barcelona, Spain

Conference Dates : October 26-27, 2015