Dam Break Model Using Navier-Stokes Equation

Authors : Alireza Lohrasbi, Alireza Lavaei, Mohammadali M. Shahlaei

Abstract : The liquid flow and the free surface shape during the initial stage of dam breaking are investigated. A numerical scheme is developed to predict the wave of an unsteady, incompressible viscous flow with free surface. The method involves a two dimensional finite element (2D), in a vertical plan. The Naiver-Stokes equations for conservation of momentum and mass for Newtonian fluids, continuity equation, and full nonlinear kinematic free-surface equation were used as the governing equations. The mapping developed to solve highly deformed free surface problems common in waves formed during wave propagation, transforms the run up model from the physical domain to a computational domain with Arbitrary Lagrangian Eulerian (ALE) finite element modeling technique.