Geophysical Research Abstracts
Vol. 14, EGU2012-10395-1, 2012
EGU General Assembly 2012

Simulation of landslide-generated tsunamis with the HySEA platform: Application to the the Lituya Bay 1958 tsunami

J. M. González-Vida (1), M.J. Castro (2), C. Sánchez-Linares (2), and M. de la Asunción (2)

(1) Dpt. Applied Mathematics, University of Málaga, Spain (jgv@uma.es), (2) Dpt. Mathematical Analysis, University of Málaga, Málaga, Spain

We present a PVM-IFCP finite volume scheme for two-layer Savage-Hutter type model to study submarine avalanches (and generated tsunamis) where a layer composed of fluidized granular material is assumed to flow within an upper layer of an inviscid fluid (e. g. water).

A coupled hyperbolic PDE system is considered where the fluid layer is modelled by Shallow-Water equations and the sediment layer is modelled by a Savage-Hutter type model where buoyancy effects has been considered. The system is discretized using a PVM (Polynomial Viscosity Matrix) finite volume scheme. In particular we use a first order PVM scheme called IFCP (Intermediate Field Capturing Parabola) by using a suitable decomposition of a Roe matrix by means of a parabolic viscosity matrix that captures information of the intermediate fields. This scheme has been implemented on GPUs for structured and non-structured grids obtaining large speed-ups in comparison with CPUs implementations.

We will show how the HySEA web platform is used as interface for real applications of this model. A realistic experiment based on the 1958 Lituya Bay mega-tsunami will be shown and the results compared with real data.