



3D numerical simulation of breaking waves

Philippe Fraunie (1), Alioune Sambe (1), Frederic Golay (2), Damien Sous (2), and Marcer Richard (3)

(1) Universite de Toulon et du Var (CNRS), Laboratoire de Sontages Electromagnetiques de l'Environnement Terrestre, La Garde Cedex, France (philippe.fraunie@lseet.univ-tln.fr), (2) Universite de Toulon et du Var Institut de Mathématiques de Toulon, (3) PRINCIPIA R&D

A fast and parallel two phase flows model has been developed for 3D CFD kinematics of incompressible air-water flows by solving Euler and Reynolds Averaged Navier Stokes equations with unstructured grids.

An artificial compressibility approach allows a fast fully explicit scheme allowing efficient parallel implementation. The numerical model is based on a low Mach number preconditioning and a second order Riemann solver for advection equation. Many improvements, as front sharpening, isothermal equation of state and multi-scale time stepping, allow three-dimensional applications, like breaking waves impact on structures.