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## A new and efficient procedure for dispersive tsunami simulations on spherical coordinates based on a hyperbolic approach

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When tsunamigenic events are simulated in deep to moderately deep waters, frequency dispersion effects may become mandatory. In the framework of dispersive systems, non-hydrostatic pressure type models have been shown to be able to describe weakly dispersive waves [2,3]. Although promising results begin to glimpse nowadays, dispersive solvers are still far from being robust, efficient and able to compute on a faster than real-time (FTRT) basis. The main difficulty that presents this type of systems is that at each time step a parabolic-elliptic problem has to be numerically solved and a high computational effort is required.

In [1] a novel weakly non-linear and weakly dispersive system that takes into account dispersive effects is presented. The main advantage is that the system is strictly hyperbolic and that any explicit numerical scheme can be applied to solve numerically the equations.

We will present new numerical results from an upgrade of the system presented in [1], considering curvature effects through a rewriting of the system in spherical coordinates. The numerical results will cover some standard field validation tests involving tsunami propagation waves. Besides, the explicit numerical scheme has been implemented exploiting the power of modern GPU architectures (CUDA). Then, numerical results along with some computational times will show that this numerical model opens a new line on tsunami simulation scenarios, using a new, efficient and accurate procedure to produce FTRT tsunami propagation including dispersive effects.

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