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A NEW NUMERICAL METHOD TO SOLVE THE BIDIMENSIONAL FLOODING CONTROL PROBLEM USING SHALLOW WATER EQUATIONS

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Abstract. This paper presents a new numerical method to solve the control problem of the flooding propagation in shallow water conditions. The direct and inverse problem is solved using similarity between both differential equations. The mass conservation equation and the momentum are included using an explicit Taylor-Galerkin method. Some tests are performed in order to validate the system: shockwaves propagation, solitaire waves and simple waves. The results are validated against the classical solution.

Moreover, the source terms are verified (wind, Coriolis and topograhical variations). The results include isocontour of adjoint functions and sensibility coefficients to validate the differential system. The adjoint and sensitivities results are in good agreement with respect to the results shown in Sanders and Katapodes [1]. The application is parallelized using OpenMP [2] with a shared memory architecture to treat some complex scenarios in reasonable time to avoid the imposed restrictions due to CFL conditions.

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