Simulation of the hydrodynamic in breaking undular bore

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Abstract

A tidal bore is a positive surge generated by the tide as it progresses upstream estuaries and rivers. Bores can be purely undular, where the water level rises smoothly and is followed by a wave train. They can be purely breaking, where the water level rise abruptly due to a breaking front followed by zero undulation. But bores can also present a mix of the conditions, where the front breaks and a wave train still follows; this happens for breaking undular bores. By solving the Navier-Stokes equations in 3D, using a LES model and a VOF method, we reproduced breaking undular bore. The simulation results give detailed information on the hydrodynamic.

Reference

B. Simon, 'Effects of tidal bores on turbulent mixing: A numerical and physical study in positive surges', PhD thesis, Université de Bordeaux, France / University of Queensland, Australia, Bordeaux, France - Brisbane, Australia, 2013. www.theses.fr/2013BOR15231