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Near coast tsunami waveguiding

E. van Groesen

1. Dept. Applied Mathematics, University of Twente, Netherlands (groesen@math.utwente.nl)
2. LabMath-Indonesia, Bandung, Indonesia

Shallow parts in a sloping bottom towards the coast can be expected to act as a waveguide, in partial analogy with optical waveguiding. We will present numerical simulations that convincingly show that such a phenomenon can actually happen for tsunami-like waves. Numerical simulations for synthetic geometries and bathymetries that are chosen realistically show that large enhanced wave amplification happens for tsunami-type of incoming waves. Since this is even the case for shallow regions that have cross sections of the order of commonly used numerical gridsize for tsunami simulations (1', approx. 1850m), this phenomenon seems to have been overlooked somewhat in the literature, but may contribute to an explanation of locally appearing (observed) extreme wave heights.