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Tsunami Waveguiding Simulation Above Synthetic and Realistic Bathymetries

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In this contribution we show that relatively narrow and shallow elongated areas in the propagation direction of a tsunami wave can produce largely amplified waves by the phenomenon that we call near-coast tsunami waveguiding (see [1]). This phenomenon may contribute to an explanation that tsunami wave heights and coastal effects show high variability along the coastline. To show this phenomenon, we use the recently derived Variational Boussinesq Model (VBM) as a dispersive wave model. This model is implemented numerically by using Finite Element Method (FEM) and used to simulate a tsunami that will show to posses the tsunami waveguiding property. We will compare simulations with the linear VBM and the nonlinear VBM, for synthetic data and for a real case in the Indonesian coastal area.

[1] Van Groesen, E. , Adytia, D. and Andonowati. *Near-coast tsunami waveguiding: phenomenon and simulations.* Natural Hazards and Earth System Sciences, 8, 175-185. 2008.