



## **A combined model for tsunami generation and propagation**

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Several tsunami models apply different wave models and numerical schemes with the aim of modelling the wide variety of wave phenomena, as its generation, propagation, transformation and run-up. However, models are limited by mathematical and numerical formulations which constrain their scope of applications. Combined models are an interesting option as they allow merging the advantages of different existent models into a single one. In this work a tsunami combined model which couples the GeoClaw code, an extension of the Clawpack software for geophysical flows using adaptive finite volume methods, with the fully non-linear, phase-resolving, time-stepping Boussinesq wave model FUNWAVE-TVD for near-shore water wave propagation is presented. GeoClaw is used for the seismic tsunami generation of the 1969 Portugal tsunami and with FUNWAVE-TVD we study the propagation of the tsunami and near-shore surface elevations. Both codes have been individually benchmarked with some mandatory established benchmark problems. The results obtained from the numerical simulation are compared with existent observational data along the Portuguese coast for this historical event.

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