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Simulation of the 26 December 2004 tsunami: The Thailand case study

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The 26 December 2004 Indian Ocean is simulated through a fully nonlinear Boussinesq model with a special focus on the calibration of the co-seismic source. The source has been constructed with the use of the numerous data available, i.e. tide gauges signals in both parts of the ruptured area (Indian ocean and Andaman sea), and JASON-1 altimetric signal. From these data, a 5-segments dislocation source is derived with a time sequence spanning 1100 s. The comparison between observations and simulations is, a priori, robust since the propagation model (Funwave) takes into account most of the physics involved, in particular the frequency dispersion. The computational domain was built using ETOPO2 bathymetry and more accurate data sets around selected areas (Thailand). The simulated wave heights are in in good agreement with observations obtained from the numerous post-tsunami field surveys, especially at locations where the bathymetry is well represented. Consequently, these simulations provide us with a synoptic picture of the event. Finally we performed with good success the Thailand Case study for which we tested the various scenarii that were observed, in particular in Khao Lak were the wave was the most devastating and in kho Phiphi where the sequence of events was well described.