



Hazard assessment of underwater landslide-generated tsunamis for the Padang region, Indonesia

S. Brune(1), A.Y. Babeyko(1), S.V. Sobolev(1), S. Harig(2), A. Androsov(2), J. Behrens(2)

(1) GFZ Potsdam, Germany, (2) AWI Bremerhaven, Germany (brune@gfz-potsdam.de)

Submarine landslides can generate local tsunamis with high runups, posing a hazard to human lives and coastal facilities. Both historical (giant Storegga slide off Norwegian coast) and recent (Papua New Guinea, 1998) events show high potential danger of tsunamigenic landslides and the importance of mitigation efforts. Numerical assessment of landslide-induced tsunami hazard is a part of the German Indonesian Tsunami Early Warning System (GITEWS). The present contribution illustrates our approach, the numerical methods and some preliminary results for the region of Padang (Western Sumatra, Indonesia). This highly populated city with over 800000 inhabitants exhibits extreme tsunami vulnerability due to its very low elevation of a few meters to some tens of meters. We provide a systematic parametric study of landslide-induced tsunamis in the area of Padang by kinematically prescribing landslide evolution. Parameters of landslide include location, dimensions and velocity. Tsunami propagation and runup is modeled with an unstructured, nonlinear, finite element code. Our study allows us to distinguish potentially dangerous scenarios for Padang and to provide recommendations for the optimal deployment of tsunami-detecting buoys. We also address the problem of remote detection of real-time landslide movement by means of tiltmeters installed at the coast.