



A GPU implementation of adaptive mesh refinement to simulate tsunamis generated by landslides

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In this work we propose a CUDA implementation for the simulation of landslide-generated tsunamis using a two-layer Savage-Hutter type model and adaptive mesh refinement (AMR). The AMR method consists of dynamically increasing the spatial resolution of the regions of interest of the domain while keeping the rest of the domain at low resolution, thus obtaining better runtimes and similar results compared to increasing the spatial resolution of the entire domain. Our AMR implementation uses a patch-based approach, it supports up to three levels, power-of-two ratios of refinement, different refinement criteria and also several user parameters to control the refinement and clustering behaviour. A strategy based on the variation of the cell values during the simulation is used to interpolate and propagate the values of the fine cells. Several numerical experiments using artificial and realistic scenarios are presented.