

Simulating the effect of Tsunamis within the Build Environment

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Abstract

Impacts to the built environment from a hazard such tsunami are critical in understanding the economic and social effects of such events on our communities. In order to better understand these effects, Geoscience Australia and the Australian National University are developing a software modelling tool for the simulation of inundation of coastal areas by tsunamis. The tool is based on solving the Shallow Water Wave equation using a finite-volume method based on unstructured triangular grids with fluxes calculated using a central scheme. An important capability of the method is its ability to model the process of wetting and drying as water enters and leaves an area. This means that it is suitable for simulating water flow onto a beach or dry land and around structures such as buildings. It is also capable of resolving hydraulic jumps, due to the ability of the central scheme to handle discontinuities. This talk will describe the mathematical and numerical models used, the architecture of tool and the results of a series of validation studies, in particular the comparison with experiment of a tsunami run-up onto a complex three-dimensional beach.

Keywords: Tsunami; Shallow Water Wave equation; Finite Volume Method