



## **Tsunamis over artificial and real bathymetries**

Massimiliano Cannalire

Faculty of Science, Chulalongkorn University. Bangkok 10330, Thailand (tsunami\_study@techemail.com)

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Massimiliano Cannalire

Tsunami\_Study@Techemail.com

Faculty of Science, Chulalongkorn University. Bangkok 10330, Thailand.(\*)(\*)

### Abstract

Studying tsunami propagation implies the knowledge of the medium through which tsunamis propagate. In the case of both wave-basin solitary wave simulators and real tsunamis events, the real or simulated sea floors need to be known.

The propagation of solitary waves, as models for tsunamis, is affected by changes in the medium homogeneity. In another paper (“Modifications of solitary waves in non homogeneous medium: Modeling and Simulation”) we have analyzed how a non homogeneous medium modifies the propagating wave; in this paper we go into the details of the medium.

Models of artificial bathymetries are shown and related to the wave propagation and modifications.

Then the model of an artificial bathymetry, reassuming the main features of a real bathymetry, is proposed and the modifications induced on tsunami solitary waves are simulated.

Finally a case study including a real bathymetry is presented.

The propagation and wave modifications are carried out till the eventual breaking point of the wave and we deduce indications useful for relating bathymetries and costal profiles to tsunami risk mitigation

The theoretical context in which we model our solitary waves is the Kortweg and de Vries equation.

**Keywords:** Solitary wave, Korteweg and de Vries equation, bathymetry, tsunami propagation, simulation of wave propagation, tsunami risk mitigation.

(\*) Not currently at Chulalongkorn University

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