

Abstract

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Modeling of tsunami generation and propagation by a spreading curvilinear seismic faulting in linearized shallow-water wave theory

The processes of tsunami evolution during its generation in search for possible amplification mechanisms resulting from unilateral spreading of the sea floor uplift is investigated. We study the nature of the tsunami build up and propagation during and after realistic curvilinear source models represented by a slowly uplift faulting and a spreading slip-fault model. The models are used to study the tsunami amplitude amplification as a function of the spreading velocity and rise time. Tsunami waveforms within the frame of the linearized shallow-water theory for constant water depth are analyzed analytically by transform methods (Laplace in time and Fourier in space) for the movable source models. We analyzed the normalized peak amplitude as a function of the propagated uplift length, width and the average depth of the ocean along the propagation path. The processes of tsunami evolution during its generation in search for possible amplification mechanisms resulting from unilateral spreading of the sea floor uplift is investigated. We study the nature of the tsunami build up and propagation during and after realistic curvilinear source models represented by a slowly uplift faulting and a spreading slip-fault model. The models are used to study the tsunami amplitude amplification as a function of the spreading velocity and rise time. Tsunami waveforms within the frame of the linearized shallow-water theory for constant water depth are analyzed analytically by transform methods (Laplace in time and Fourier in space) for the movable source models. We analyzed the normalized peak amplitude as a function of the propagated uplift length, width and the average depth of the ocean along the propagation path.