Computer simulation of the landslide-induced 1741 Oshima-Ohshima tsunami in the Japan Sea

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Abstract. The 1741 Japan Sea tsunami is shown to fit the hypothesis of the generation by the lateral collapse of the Nishi-yama volcano in Oshima-Ohshima island, which is located almost 60 km off the western coast of the Oshima Peninsula (Japan Sea). After 1500 years of quiescence the volcano entered a period of high activity that culminated with a violent explosion in the early morning of 29 August 1741, provoking the lateral collapse of the cone. The tsunami that is reported to have inundated the coasts of the Oshima Peninsula and north Honshu, causing more than 1500 deaths, can be attributed to this collapse. The paper presents numerical simulations of the event by means of a combination of a Lagrangian model to evaluate the dynamics of the Nishi-yama slide and of a Eulerian finite-element model to calculate the generation of the tsunami and its propagation in the Japan Sea. Data on the volume and shape of the involved mass before and after the collapse, as well as the bathymetric data matrix, have been made available by Dr. K. Satake. The computed wave heights of the tsunami along the Japanese coasts are compatible with the observed run-up.

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