



The effect of tsunami focusing

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The process of focusing means the simultaneous arrival of the wave from different directions into one point. Characteristics of the wave, coming from a distant source mainly depend on its size and peculiarities of the bathymetry between a source and an observation point. A certain configuration of the bottom roughness can cause the focusing of the initially plane wave front. Near to a tsunami source the main role in the wave signal formation plays distribution of the initial surface displacement in it. Some configurations of tsunami source can cause the focusing of the tsunami waves coming from different parts of the initial surface displacement. In this paper the authors make an attempt to theoretically describe and to numerically confirm the conclusions about the process of tsunami waves generation by two-dimensional “rise and fall” initial ocean surface displacements. The main result of the study is the proof of the existence of the focusing point for the combined plus-minus initial displacement, where an abnormal tsunami wave height can be recorded. If a tsunami source is sufficiently large, the focus point can be located just near the coast. This effect can give explanation for an extremely high tsunami amplitude in some localities during the known historical events.