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Modeling of the near-resonant scenarios of the submarine landslide tsunami generation

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The problem of the tsunami wave generation by the submarine landslide, which is moving along the bottom slope, was studied. The necessary conditions (geometry of a slope and sliding body density) for a resonance are defined. A number of numerical experiments were carried out for a model submarine landslide. The maximum amplitude and the wave length were defined for various landslide profiles and their moving rates. As expected, the highest waves are generated when the velocity of the submarine mudslide is equal to the long wave propagation velocity. The landslides, which are moving slower and faster than the resonant one, generate waves with lower amplitude and a bigger wave length. The generated waves have a fairly expressed directivity of radiation. Some peculiarities of the Ugamak tsunami of April 1, 1946 were studied.
A number of experiments in the hydro-wave flume (2D) and in the wave basin (3D) were carried out. Various bottom slopes and sliding body shapes were used. The comparison of the theoretical, numerical results and the experimental data is performed.