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Mathematical modelling of submarine landslide motion

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The paper presents a mathematical model to calculate dynamic parameters of a submarine landslide. The problem of estimation possible submarine landslides dynamic parameters and run-out distances as well as their effect on submarine structures becomes more and more actual because they can have significant impacts on infrastructure such as the rupture of submarine cables and pipelines, damage to offshore drilling platforms, cause a tsunami. In this paper a landslide is considered as a viscoplastic flow and is described by continuum mechanics equations, averaged over the flow depth. The model takes into account friction at the bottom and at the landslide-water boundary, as well as the involvement of bottom material in motion. A software was created and series of test calculations were performed. Calculations permitted to estimate the contribution of various model coefficients and initial conditions. Motion down inclined bottom was studied both for constant and variable slope angle. Examples of typical distributions of the flow velocity, thickness and density along the landslide body at different stages of motion are given.
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