



Surface waves generated by submerged plate

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We consider non-stationary problem on generation of intense surface waves by localized underwater disturbances. Fully nonlinear water wave problem is considered in the presence of an obstacle submerged beneath a free surface of deep fluid. The finite-size obstacle is modeled here by thin plate impulsively moving from rest. In this framework, we study theoretically the piston mechanism of generation of hazardous tsunami-type waves due to fast deformation of compact bottom area. Small-time asymptotic solution is constructed by elementary functions for an accelerated obstacle started in any direction. Magnitude of acceleration is involved into the mathematical model as the control parameter, so the initial stage of the flow is simulated with high asymptotic accuracy. Variation of basic parameters demonstrates that the leading-order solution reproduces realistically main features of non-stationary wave pattern caused by underwater landslides.

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