

ON THE RUN-UP OF LONG WAVES GENERATED BY A LOCALIZED SOURCE ON A SHALLOW BEACH

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Pelinovsky and Masova [1] suggested a method, later used in many papers (e.g., see [2, 3]), for finding the run-up of long waves (in particular, tsunami waves) on a shallow beach in the 1D case. This method is based on the results due to Carrier and Greenspan [4] for the 1D nonlinear shallow water equations over a linear bottom. We consider a similar problem in the 2D case for waves generated by localized sources. We find semiclassical asymptotic solutions of the linearized problem [5] with the use of a modified Maslov canonical operator [6]; the coastline is viewed as a caustic of special form, and Fock's quantization formulas for canonical transformations are used to represent the asymptotic solutions of the linearized problem near the shore via a Hankel type transform. Then an analog of the Carrier–Greenspan transformation is applied to obtain algebraic formulas for the uprush in the case of simple sources of special form.

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