

Kluczek, Mateusz; Andrade, David; Stiassnie, Michael

On the Alber equation for shoaling water waves. (English) Zbl 1481.76100
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Summary: The problem of unidirectional shoaling of a water-wave field with a narrow energy spectrum is treated by using a new Alber equation. The stability of the linear stationary solution to small non-stationary disturbances is analysed; and numerical solutions for its subsequent long-distance evolution are presented. The results quantify the physics which causes the gradual decay in the probability of freak-wave occurrence, when moving from deep to shallow coastal waters.

MSC:

- 76E20 Stability and instability of geophysical and astrophysical flows
- 76B15 Water waves, gravity waves; dispersion and scattering, nonlinear interaction
- 76M20 Finite difference methods applied to problems in fluid mechanics
- 86A05 Hydrology, hydrography, oceanography

Keywords:

linear stability analysis; long-distance evolution; surface gravity wave; topographic effect; finite difference scheme; cubic Schrödinger equation

Full Text: [DOI](#)

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