

Transverse Instability of Surface Solitary Waves

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The linear stability of finite-amplitude surface solitary waves with respect to long-wavelength transverse perturbations is examined by the asymptotic analysis for small wavenumbers of perturbations. The instability criterion is explicitly derived, and it is newly found that there exist transversely unstable surface solitary waves for the amplitude-to-depth ratio of over 0.713. This critical ratio is well below that for the one-dimensional instability (≈ 0.781).

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