Transition to turbulence at the bottom of a solitary wave

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In this presentation a recent analysis made by Blondeaux, Pralits and Vittori will be presented in which a linear stability analysis of the laminar flow in the boundary layer at the bottom of a solitary wave has been made to determine the conditions leading to transition and turbulence appearance. The Reynolds number of the phenomenon is assumed to be large and a 'momentary' criterion of instability is used. The results show that the laminar regime becomes unstable, during the decelerating phase, when the height of the solitary wave exceeds a threshold value which depends on the ratio between the boundary layer thickness and the local water depth. A comparison of the theoretical results with the experimental measurements of [1] supports the analysis

References

[1] B.M. Sumer, Jensen P.M., L.B. Sorensen, J. Fredsoe, P.L.F. Liu, and S. Carstensen. Coherent structures in wave boundary layers. part 2. solitary motion. *J. Fluid Mech.*, 646:207–231, 2010.