

A Numerical Model for Soliton Fission and Wave Breaking of Shallow Water Waves

by

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Abstract

Numerical calculations of shallow water waves with their disintegration into solitons are generally carried out by the Boussinesq equations. However, the Boussinesq equations do not automatically lead to wave breaking, because the frequency dispersion tends to balance the nonlinearity and to stabilize the wave profiles. Further the amplification of wave height in region just before breaking is also not sufficient due to their weak nonlinearity and dispersion. The artificial additional terms should be considered in the equations.

In this study, two kind of artificial terms are investigated through comparisons between numerical and hydraulic experimental results. One is an artificial amplification term for just before the breaking region and the other is a breaking term for spilling breakers. Both artificial terms are formulated as a momentum dissipation form.

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