
Numerical Approximation of Solitary waves in the Benjamin-Ono and the Intermediate Long Wave systems

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Abstract

We consider the Benjamin-Ono and the Intermediate Long Wave systems derived in [1] that model two-way propagation of long internal waves of small amplitude along the interface of two fluid layers under the effects of gravity. After reviewing some theoretical properties of the models at hand, we present numerical evidence of the existence of solitary waves. Some properties of the waves, suggested by the numerical experiments, are discussed including the speed-amplitude relation and their asymptotic decay rate. We also present some numerical studies concerning the dynamics of the waves which involve experiments about their interactions, stability properties along with comparisons with their unidirectional counterparts.

References

- [1] J.L. Bona, D. Lannes and J.-C. Saut, Asymptotic models for internal waves, *J. Math. Pures Appl.*, **89** (2008), pp. 538-566.

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