

Bifurcation of interfacial progressive waves

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We consider progressive water-waves on the interface of two fluids with different densities. The interface is a free boundary to be sought. Such interfacial waves are generalizations of surface waves, which we have studied extensively before. Our purpose of the study is to give a mathematical explanation for our numerical results on bifurcations of surface waves by means of the theory of interfacial waves. Namely the complicated structure of the surface waves can be explained by regarding the surface waves as special cases of interfacial waves.

We will show our reformulated interfacial wave problem and some of our numerical experiments. It is a bifurcation problem with 3 parameters concerning with gravity, surface tension and the ratio of the propagation speed between the upper and lower fluids.