

## Generalized Internal Solitary Waves and Fronts

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It has been shown by several authors that waves in a two-layer system with free-surface boundary conditions (or in a three-layer system) can be modelled by a system of two coupled long wave equations. The study of the resonance between a solitary wave of one of the two equations and a copropagating periodic wave of the other equation is carried out numerically. The resulting wave is a generalized solitary wave. It is shown that in the case of a thick solitary wave (solution of a modified Korteweg–de Vries equation with a cubic nonlinearity), the generalized solitary waves do not behave like common sech square generalized solitary waves. Simplified models are introduced, which allow a better understanding of these stationary and time-dependent long wave solutions.

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