

UNSTEADY WAVES ON AN
OPEN TWO LAYER FLUID

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The interaction and evolution of small amplitude gravity waves on an open two layer fluid is investigated. The surface and interface displacements are represented as spatially periodic Fourier series with time dependent coefficients, for which evolution equations with all significant quadratic interactions included, are derived. Both steady and unsteady solutions to these equations are found, analytically for a small number of wave modes, and numerically for a larger number of modes. The steady numerical solutions are obtained using a robust variation of Davidenko's continuation method while an efficient integration scheme is used to find the unsteady solutions. Numerical examples are given to illustrate general properties of the interactions and evolution.

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