

Quantitative study of wave resonance conditions for a two-fluid system

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Wave interaction occurs everywhere in oceans and plays an important role in changing wave profile, transferring wave energy, and communicating nutrients and pollutants. With specific conditions, a very strong interaction, i.e. wave resonance (WR), will occur. A pioneering work by Phillips (1960) ignited a new era of studying wave resonance. After more than half of a century, today WR is still a hot topic and continues attracting a lot of scholars involved in related theoretical and experimental studies. In general, higher-order solutions, more complicated boundary conditions, and more layers of fluids are of great academic values presently. In this paper, WR in a single fluid and a two-layer fluid is quantitatively demonstrated. Present results will be used to plan an experimental study in the coming future.

Keywords: wave resonance, two-fluid system