

PHYSICAL MATH SEMINAR

The Resonance of free-surface water waves in cylinders



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ABSTRACT:

Nonlinear resonance is a mechanism by which energy is continuously exchanged between a small number of wave modes, and is common to many nonlinear dispersive wave systems. In the context of free-surface gravity waves, nonlinear resonances have been studied extensively over the past 60-years, almost always on domains that are large compared to the characteristic wavelength (such as oceans). In this case, the dispersion relation dictates that only quartic (4-wave) resonances may occur. In contrast, nonlinear resonances in confined three-dimensional geometries have received relatively little attention, where, perhaps surprisingly, stronger 3-wave resonances do occur. We will present the results characterizing the configuration and dynamics of resonant triads in cylindrical basins of arbitrary cross sections, demonstrating that these triads are ubiquitous.

TUESDAY, MARCH 5, 2024

2:30 PM – 3:30 PM

Building 2, Room 449

<https://math.mit.edu/pms/>