

PHYSICAL MATHEMATICS SEMINAR

Computation of three-dimensional standing water waves

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ABSTRACT:

We develop a method for computing three-dimensional gravity-driven water waves, which we use to search for time-periodic standing wave solutions. We simulate an inviscid, irrotational, incompressible fluid bounded below by a flat wall, and above by an evolving free surface. The simulations require computing a velocity potential in the bulk of the fluid, which we carry out using a fourth-order finite element method; this computationally expensive step is solved using a parallel multigrid algorithm. Several families of large-amplitude three-dimensional standing waves are found in both shallow and deep regimes, and their physical characteristics will be examined and compared to previously known two-dimensional solutions.

TUESDAY, FEBRUARY 11, 2014

2:30 PM

Building E17, Room 136

*Reception following in Building E17, Room 401A
(Math Dept. Common Room)*

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



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