Capillary-gravity water waves with exponentially localized vorticity

Samuel Walsh
University of Missouri
walshsa@missouri.edu

Abstract

In this talk, we discuss recent success in establishing the existence of solutions to the water wave problem with exponentially decaying vorticity. These are two-dimensional stationary waves in a finite-depth body of water beneath vacuum. An external gravitational force acts in the bulk, and the effects of surface tension are felt on the air-sea interface. Our approach involves modeling the corresponding stream function as a spike solution to a singularly perturbed elliptic PDE. This is joint work with Mats Ehrnström (NTNU) and Chongchun Zeng (Georgia Tech)