

PHYSICAL MATHEMATICS SEMINAR

Internal Wave Excitation by Turbulent Convection

DANIEL LECOANET

University of California, Berkeley

ABSTRACT:

Convection near a stably stratified region can excite internal gravity Waves. This occurs in a wide range of geophysical and astrophysical settings, including the Earth's atmosphere and core, some gas giants like Saturn, and most stars including the sun. We will present a joint experimental & computational study of internal wave generation by convection. We describe an experiment using the peculiar property of water that its density maximum is at $4^{\circ} C$. A tank of water cooled from below and heated from above develops a cold, convective layer near $4^{\circ} C$ at the bottom of the tank, adjacent to a hot stably stratified layer at the top of the tank. We simulate this setup in 2D using the open-source Dedalus code (dedalus-project.org). Our simulations show that waves are excited from within the convection zone, opposed to at the interface between the convective and stably stratified regions.

TUESDAY, SEPTEMBER 22, 2015

2:30 PM

NOTE LOCATION > Building 66, Room 144

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

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