



JOHNS HOPKINS
Center for Environmental
& Applied Fluid Mechanics

Weekly CEA FM Seminar: Spring 2014

Date: **Friday, April 11, 2014**

Time: 11:00 AM

Location: Gilman # 50 (Marjorie M. Fisher Hall)

Speaker: **Dr. Thomas Peacock** (Massachusetts Institute of Technology)

Title: ***“Topographic Scattering of the Low Mode Internal Tide in the Deep Ocean”***

Abstract

Internal waves play key roles in a myriad of large- and small-scale processes in the ocean. For example, it is now recognized that internal waves are an important consideration for the global-scale ocean energy budget as they represent a significant source of dissipation for barotropic tides and winds, the two primary sources of mechanical energy that drive ocean interior mixing. An outstanding issue in physical oceanography, however, is determining the fate of this internal wave energy as it propagates through the ocean interior.

We investigate the role of deep-ocean topography in scattering energy from the large spatial scales of the low mode internal tide to smaller spatial scales. The complete Green function method is used for the first time to study the two-dimensional scattering of a mode-1 internal tide incident on topography of any form in arbitrary stratifications. A significant finding is that compared to large extents of small-amplitude, rough topography, which has been the traditional consideration, a single large topographic feature along the path of a mode-1 internal tide plays the dominant role in scattering the internal tide. Given that any internal tide is likely to encounter at least one tall feature along its path, we conclude that scattering by ocean floor topography can be a significant mechanism to transfer energy from large to small spatial scales.