Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Boundary Layer Effects on Internal Wave Generation in a Stably Stratified Fluid LAUREN EBERLY, JULIE VANDERHOFF, Brigham Young University — Through a series of laboratory experiments we attempt to quantify internal wave generation due to flow over the rough topography of a continental slope. Although significant progress has been made in flow over rough topography, few experimental studies have been done where the topography is oriented at an angle to both the isobaths and flow. Laboratory investigation is critical as linear theory is not completely accurate in describing generated internal waves. The disparity between linear theory and physical observation is greatest when the wave amplitudes reach a critical level or when boundary layer separation occurs. Previous experimental work on bottom topography suggests that linear theory over predicts the amplitude of generated lee waves as it does not account for effects due to boundary layer separation. This study employs a series of experiments to analyze an approximately two-dimensional, stably stratified fluid undergoing tidal flow over a topographically rough, sloped shelf. The laboratory set up utilizes a corrugated slope towed through the fluid as the forcing mechanism behind internal wave generation. The waves are visualized using the Synthetic Schlieren technique. Results show decreased internal wave amplitude from that predicted by linear theory.

Lauren Eberly
Brigham Young University

Date submitted: 06 Aug 2010 Electronic form version 1.4