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Department of Atmospheric Sciences Seminar Announcement

Department of Atmospheric Sciences, S.O.E.S.T., University of Hawai'i at Mānoa
2525 Correa Road, HIG 350; Honolulu, HI 96822 ☎956-8775



The DEEPWAVE campaign over New Zealand: Mountain waves fluxes and scales

Professor Ronald B. Smith

Department of Geology & Geophysics
Yale University

Date: Wednesday, March 22, 2017
Refreshments: 3:00pm at MSB courtyard
Free Cookies, Coffee & Tea Provided
(Please Bring Your Own Cup)
Seminar Time: 3:30pm
Location: Marine Sciences Building, MSB 100

Abstract:

The DEEPWAVE field campaign in June and July 2014 studied the deep penetration of gravity waves from the troposphere into the stratosphere and mesosphere. A few aspects of that study will be presented here. Airborne observations (97 legs) of waves over New Zealand in the lower stratosphere show the expected characteristics of steady mountain waves: positive vertical energy flux, negative momentum flux and upwind horizontal energy flux. The extreme leg zonal momentum flux was $MF = -550 \text{ mPa}$.

DEEPWAVE aircraft observations are extended using high resolution modeling of wave generation, propagation and breakdown. The deep upward propagation of these waves is controlled by weak winds and wave breaking in the $z=14$ to 25km "valve layer" in the lower stratosphere. Strong momentum deposition and Potential Vorticity generation occurs in this layer. High resolution well-validated WRF simulated momentum fluxes are compared with MERRA GWD parametrizations with large discrepancies noted. Such an error could degrade climate model accuracy.