UNIVERSITY of HAWAI'I MĀNOA

Department of Atmospheric Sciences Seminar Announcement

Department of Atmospheric Sciences, S.O.E.S.T., University of Hawai'i at Mānoa
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SCHOOL OF OCEAN AND EARTH SCIENCE AND TECHNOLOGY

Eyewall Buoyancy and Intensity Change in Hurricane Rita (2005)

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Date: Wednesday, April 6, 2016
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 radial location and timing of convective bursts in the tropical cyclone eyewall are critical for intensification efficiency, and thus directly impact tropical cyclone intensity change. However, the forcing mechanisms which determine the location and timing of these convective bursts are not fully understood. Ordinary tropical convection is generally forced by positive buoyancy, but rotational forces and a strengthening warm core play a progressively important role in organizing convection as a tropical cyclone intensifies. Further clarification is needed to determine the role of buoyancy in tropical cyclone intensity change throughout its life-cycle.

Buoyancy can not be observed directly, nor is it defined uniquely. It can be deduced from simultaneous measurements of kinematic and thermodynamic fields, but high-resolution measurements of these fields in a tropical cyclone only exist along an aircraft track or a dropsonde profile. An indirect retrieval approach will be presented, which allows estimation of the three-dimensional buoyancy and pressure perturbations in the entire eyewall region using aircraft radar observations. A detailed analysis of the structure and buoyancy of the eyewall convection in Hurricane Rita (2005) will be presented. First, the performance of the thermodynamic retrieval approach will be assessed using a Weather Research and Forecasting (WRF) simulation. Second, the retrieval will be applied to airborne observations from the Hurricane Rainband and Intensity Change Experiment (RAINEX) field campaign. The results will be used to analyze the convective forcing in the eyewall of Hurricane Rita.