

The RAL Seminar Series



NCAR

High Resolution Measurements of Cyclone Structure -- the Profiling of Winter Storms Project

by

Prof. Robert M. Rauber

University of Illinois at Urbana-Champaign

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**Foothills Lab Building 2,
Room 1001, 10:00 a.m.**

A two-year field campaign, Profiling of Winter Storms (PLOWs), was completed during the 2008-09 and 2009-10 winters to study the dynamic and microphysical processes that govern the spatial and temporal variability of precipitation in the warm frontal and the “wrap-around” deformation zone of continental extratropical cyclones over the central United States. During this seminar, I will review preliminary findings of PLOWs focusing on exceptionally high, ~15 meter horizontal resolution measurements of precipitation band structure. These data are derived from reflectivity and vertical air velocity measurements of the Wyoming Cloud Radar, a ground based X-Band vertically pointing Doppler radar, Profiler data and microphysical measurements from the NCAR/NSF C-130 aircraft. I will relate these measurements to the larger scale cyclone structure, and provide an interpretation of the dynamics of these bands consistent with the thermodynamic and kinematic measurements.

Several outstanding features of the data will be emphasized, including the common overrunning of upper tropospheric dry air over the warm front, the prevalence of elevated, upright, deep convection on the warm side of wrap-around region, the near-omnipresence of cloud-top convection, turbulence and supercooled water at very cold temperatures, the surprising lack of banded features on the cold side of the wrap around, and the complete misinterpretation of all of these features that one obtains from analysis of WSR-88D reflectivity measurements due to their poor vertical resolution and reduced sensitivity.