

**ATS/CIRA Colloquium**

## **Tammy Weckwerth**

**Visiting ATS from NCAR Earth Observing Laboratory**

**Part I: Where, When and Why did it Rain during PECAN?**

**Part II: Overview of NCAR's Water Vapor DIAL**

**Hosted by Michael Bell**

**Friday, March 9, 2018**

**ATS room 101**

**Discussion will begin at 11:15 a.m.**

**Refreshments will be served at 10:45 a.m. in the weather lab**

Part I: The 2015 Plains Elevated Convection At Night (PECAN) field campaign, based in Hays, KS, was designed to understand the causes of and improve the predictive skill of the central U.S. nocturnal precipitation maximum. Over 100 instruments were utilized to sample the pre-convective and convective conditions within and around unorganized storms and mesoscale convective systems.

Multiple WSR-88D radars were combined with NCAR's S-Pol radar to estimate the quantitative precipitation (QPE). As expected, the PECAN precipitation maximum occurred overnight from 03-09 UTC (10-04 CDT). The rainfall came nearly equally from systems that initiated in both the plains and mountains. The convection initiation (CI) events occurred most frequently in the late afternoon in the mountains and early evening in the plains. The top 10% rain-producing storms dropped 91% of the PECAN-observed precipitation. The NCEP/North American Reanalysis fields suggest a substantial difference in moisture and low-level winds between storm and non-storm days.

Part II will present an overview of the EOL and Montana State University micropulse water vapor differential absorption lidar (WV DIAL). This vertical-pointing system offers an exciting new capability in moisture sensing. The WV DIAL has been shown to run autonomously in multiple six-week field campaigns. Intercomparisons with radiosondes, AERI, GPS receivers and microwave radiometers show excellent agreement. Future plans for a 5-unit WV DIAL network and further lidar developments will also be presented.

Link to colloquia page: <https://www.atmos.colostate.edu/colloquia/>