

John Hubbert

Differential reflectivity bias caused by the temperature of the radar antenna

hubbert@ucar.edu

#### Authors

John Hubbert, NCAR,  
Mike Dixon, NCAR,

In this paper temporal Zdr (differential reflectivity) bias variations are investigated using the National Center for Atmospheric Research (NCAR) S-band polarimetric radar (S-Pol) solar scan data collected over extended time periods. The measurements reveal a high linear correlation between the ambient temperature at the radar and the Zdr. Through the solar measurements and the ratio of crosspolar powers, the components of the radar that cause the variation of the Zdr bias are identified. It is shown that the thermal expansion of the antenna is the primary cause of the Zdr bias variation. The crosspolar power (CP) technique is used for calibration of Zdr for PECAN (Plains Elevated Convection at Night) data. A technique to mitigate the Zdr bias caused by temperature variations is given. The Zdr bias from the CP technique is compared to vertical pointing Zdr bias calculations and the uncertainty of the Zdr bias estimates are given.