

Uncertainty in the Absolute Calibration of Differential Reflectivity Earle R. Williams, Kenta T. Hood, David J. Smalley, Michael F. Donovan, Betty J. Bennett and Elaine Griffin, Massachusetts Institute of Technology Lincoln Laboratory Criterion for calibration of high quality: the calibration standard is known to an accuracy exceeding the desired accuracy of any measurement (0.1dB)

Bragg Scatter





Melnikov, V., D. Zrnic, M. Schmidt, and R. Murnan, ZDR calibration issues in the WSR-88Ds, Report on 2013-MOU, 30 September, 2013.

This work is sponsored by the Federal Aviation Administrations, conclusions and recommendations are those of the author and are not necessarily endorsed by the United States Government.





Backscatter is highly variable

Pulse to Pulse



atarksi, V.I., Depolarization of light by turbulent atmospheric inhomogeneities, Radio Physics and Quantum Electronics, 10, No. 12, 987-988, 1967. heelon, A.D., Electromagnetic Scintillation, Vol. II Weak Scattering, Cambridge University Press, 2003. etal spheres, Conference on Radar Meteorology, American Meteorological Society, Breckenridge, CO., September, 2013.

Metal Sphere



balloon ~2 meter diameter



Expectation: ZDR = 0

Time Series "Pulse to Pulse" Z_{DB} Pulse to Pulse (6" Sphere) **Distributions of ZDR**

Histogram of Z_{DR} Pulse to Pulse (6" Sphere Mean: -0.54 dB, Std: 0.41 dB



Hypotheses for variability: 1) Multipath interference 2) Effects of variable medium

illiams, E., K. Hood, D. Smalley, M. Donovan, V. Melnikov, D. Forsyth, D. Zrnic, D. Burgess, M. Douglas, J. Sandifer, D. Saxion, O. Boydstun, A. Heck and T. Webster, End-to-end calibration of NEXRAD differential reflectivity with

