

6.1 MODELING DIFFERENTIAL REFLECTIVITY BIAS DUE TO ANTENNA TOPOLOGY AND OPERATING FREQUENCY

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Differential reflectivity (Z_{dr}) calibration for weather radars is an ongoing area of research. An accurate estimation of the Z_{dr} bias is important for both quantitative and qualitative interpretation of Z_{dr} . It has recently been shown that the Z_{dr} bias is a function of the ambient temperature at the radar site (Hubbert, 2017, JTECH), and data shows that it is due to the antenna system. The specific nature of the temperature dependent bias is not well understood. Numerical modeling of the NCAR's S-Pol (S-band Dual Polarimetric Radar) is carried out in an attempt to better understand of the factors affecting Z_{dr} bias such as the antenna support struts, waveguide attached to the support struts, frequency of operation and location of the phase center of the feed horn. TICRA's GRASP software is used to model the antenna. Modeling results and experimental data are presented to illustrate the concepts.