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Experimental Investigation of an X-band Polarimetric Algorithm for Attenuation Correction and Microphysical Retrieval

Marios N. Anagnostou (1), Emmanouil N. Anagnostou (2), Jothiram Vivekanandan(3)

(1,2) University of Connecticut, Department of Civil and Environmental Engineering, Storrs, CT 06269, USA (ma111@engr.uconn.edu, manos@engr.uconn.edu), (3) National Center for Atmospheric Research 3450 Mitchell Lane, Building 2, Boulder, Colorado 80303, USA (vivek@ucar.edu).

This paper investigates attenuation correction for X-band dual-polarization radar (*XPOL*) observations. In addition, an algorithm is developed for estimating raindrop size distribution (*DSD*) model parameters on the basis of attenuation corrected *XPOL* reflectivity and differential reflectivity data. The *DSD* model is assumed to be a three parameter "normalized" gamma distribution. Closely matched *XPOL* radar rays with longer wavelength (S-band) dual-polarization radar measurements (*SPOL*), taken during the International H_2O Experiment (IHOP), are used to assess the proposed *XPOL* algorithms. The study explores the dependence of attenuation correction on the selection of oblateness-size relation (or axial ratio) and the maximum diameter limit and evaluates its error characteristics for different total path-integration attenuation cases. The *XPOL* estimated DSD parameters are evaluated against DSD retrievals derived from two existing *SPOL* algorithm.