1.42POLARIMETRIC RADAR CHARACTERISTICS OF THE ASYMMETRIC EYEWALL OF HURRICANE HARVEY (2017)

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In this study, we explore the microphysical characteristics of Hurricane Harvey (2017) during its peak intensity stage. Asymmetric structures of the hurricane eyewall are associated with the hurricane intensity change and have been widely studied from the dynamic perspective. Yet, few studies discuss the microphysical structure of the asymmetric eyewall due to limited observations. Here, data collected from NEXRAD WSR-88D polarimetric radars and airborne radars are analyzed to document the microphysical and kinematic structures of the Harveys asymmetric eyewall.

The reflectivity field of the hurricane eyewall shows a wavenumber-1 asymmetric pattern for more than six hours during its peak intensity period. A higher reflectivity value of the eyewall was consistently found to the left of the vertical wind shear vector. Differential reflectivity (Z_{DR}) and specific differential phase shift (K_{DP}) also displayed similar asymmetric wavenumber-1 patterns, but both fields were shifted azimuthally with respect to the reflectivity pattern. A Z_{DR} column was found upstream of the reflectivity maximum, but higher values of KZ_{DP} were observed downstream of the reflectivity maximum. Potential causes of this unique structure due to microphysical, advective, and size sorting processes will be discussed.