

## **13.21 SEVERE HAIL DETECTION: HYDROMETEOR CLASSIFICATION FOR POLARIMETRIC C-BAND RADARS USING FUZZY-LOGIC AND T-MATRIX SCATTERING SIMULATIONS**

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Large hail is a frequently occurring and sometimes devastating phenomenon, especially during summertime convective events. Many occasions of hail stones with diameters above 5 cm up to 14 cm have been reported and confirmed in the last years in central Europe. Concepts and algorithms to detect and distinguish large hail from small hail or rain with polarimetric radars at S band exist. However, most weather radars in Europe operate at C band. Here we present the usability of operational hydrometeor classification algorithms, like the fuzzy-logic based algorithm in Park et al. (2009), at C band and the necessity of wavelength-specific, simulated parameters for these algorithms. We emphasize that specific attenuation  $A_h$  is a major factor in identifying and discriminating hail at C band. Simulating value ranges of polarimetric variables at C band and including  $A_h$  are vital key factors for hydrometeor classification at C band. Additionally, we provide an approach to obtain parameters to distinguish between rain and small, large and giant hail at C band with fuzzy-logic. The resulting fuzzy-logic based algorithm can be used for nowcasting as it enables real-time operational hail detection and size discrimination.