13.54 VERIFICATION OF RADAR HYDROMETEOR CLASSIFICATION ALGORITHMS FOR THE UK C-BAND NETWORK

B. PICKERING[12], R. NEELY III[12], D. HARRISON[3], S. BEST[3], ALAN BLYTH[12]

[1] School of Earth and Environment, University of Leeds, England
[2] National Centre for Atmospheric Science, University of Leeds, England
[3] United Kingdom Meteorological Office, Exeter, England
ben.pickering@ncas.ac.uk

Knowledge of precipitation type in near-real-time has many applications in both operational and research meteorology. Operational uses include flood forecasting, aviation and transportation. For research, cloud microphysics and NWP assimilation are ongoing topics that will benefit from 3D precipitation type data. Hydrometeor classification using weather radar is particularly desirable, due to radars high temporal and spatial resolution. Over the past 5 years the UK Met Office network of C-band Doppler weather radars have been upgraded to dual-polarisation allowing characteristics of hydrometeor phase, shape, and orientation to be determined. This information is being used in classification algorithms to determine the most likely hydrometeor type within the observed volume. Despite such algorithms being used operationally for over a decade worldwide (notably the USA), there is limited rigorous verification in the literature. Verification of hydrometeor classification skill is a particular challenge because both the classifier and the verification data are discreet. In addition, the majority of precipitation observations are made on the ground, which creates additional sources of uncertainty as the particles fall from radar-height to the surface.

This study aims to build a rigorous framework by which to verify radar hydrometeor classifiers, enabling multiple algorithms to be compared with a wide array of data sources that have various levels of certainty and representation. Using these novel methods, the improvement in hydrometeor classification using dual-polarisation radar data compared to what was previously possible with single polarisation radar will be demonstrated. To aid this process a network of 14 laser disdrometers across the UK (DiVeN) have been established for this project. These instruments can measure the fall speed and diameter of particles that fall through the instrument′s laser beam and thus precipitation type can be empirically deduced. Initial hydrometeor class verification results using the disdrometer and other sources of observation are presented here. Focus will be placed on the development of the verification methods.