

1.46 AN X-BAND STUDY OF KDP AND RAINFALL OVER SOUTHERN ENGLAND DURING WINTER 2018

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This study investigates the link between KDP throughout the cloud depth, and rainfall experienced at the surface, using data collected during a field campaign over southern England using radar measurements and in-situ observations from aircraft.

During Winter 2018, a number of flights took place over south west England to make observations of ice within clouds, with three frequencies of polarimetric Doppler radar being used at the same time to make ground based measurements from Chilbolton, UK. Here we focus on the observations made by NCAS mobile X-band dual-polarisation Doppler radar (NXPol), to study KDP measurements at temperatures throughout the cloud layer. Continuing from previous studies (mainly at S- and C- band), this work looks at the idea of increased values of KDP at temperatures around -15°C resulting in higher rainfall rates at the surface. This is done by looking at correlations between KDP measured close to the radar at different temperatures and rainfall rates as measured by drop count rain gauges located about 100 metres from the radar. As well as instantaneous correlations, correlations with rainfall lagged in time are also considered, as a stronger time-lagged correlation would prove more useful in nowcasting rainfall from operational radar observations. A stronger link between KDP aloft and rainfall at the surface in stratiform than in convective regimes has also been observed previously, so an attempt is made here to distinguish between the two to observe and verify this change in correlation strength.