Radar bright band correction using the linear depolarisation ratio

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Abstract The enhanced radar return associated with melting snow, “the bright band”, can lead to large overestimates of rain-rates. Most correction schemes rely on fitting the radar observations to a vertical profile of reflectivity (VPR) which includes the bright band enhancement. Observations show that the VPR is very variable in space and time; large enhancements occur for melting snow, but none for the melting graupel in embedded convection. Applying a bright band VPR correction to a region of embedded convection will lead to a severe underestimate of rainfall. We revive an earlier suggestion that high values of the linear depolarisation ratio (LDR) are an excellent means of detecting when bright band contamination is occurring and that the value of LDR may be used to correct the value of reflectivity in the bright band.

Key words bright band; rainfall estimation; weather radar