

6.5 THE STATISTICAL DISTRIBUTION OF ZDR IN DRY SNOW, WITH IMPLICATIONS FOR ZDR CALIBRATION

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Z_{DR} is an important quantity for the identification of hydrometeor type, and for the estimation of precipitation rate. For these purposes it is important that Z_{DR} be accurate, i.e. that the radar be well calibrated with respect to Z_{DR} . Prior work has shown that the statistical distribution of Z_{DR} in dry snow varies with meteorological regime, showing differences between mid-latitude continental situations and tropical maritime regimes. Furthermore, prior work and theory indicate that Z_{DR} , as measured by the radar, varies with elevation angle because the shape of the particle as seen by the radar varies. We study Z_{DR} in dry snow, using S-band radars, to investigate the statistical properties of the Z_{DR} distribution. This allows for a quantitative approach not only with respect to the mean of Z_{DR} , but the spread and skewness of the distribution as well. Using this approach we can summarize the Z_{DR} properties in snow for different regimes and elevation angles. This quantitative description of the Z_{DR} distribution is interesting on its own, but will also allow for improvements in the use of observations in the routine monitoring of Z_{DR} calibration for operational radars.