

1 Calibration

The calibration of the radar is necessary when the reflectivity factor is used to derive quantitative cloud parameters. Radar systems can be calibrated absolutely by measurements of individual system parameters, external calibration using point targets or comparison with in situ data. Radars with a scanning antenna can measure the return signal from a calibrated reflector of known cross section. Bergada et al. (2001) describe the calibration of a 35 GHz and 94 GHz radar using triangular corner reflectors of two different sizes and metal spheres of three different sizes. Spheres proved to work better at 35 GHz band while corner reflector measurements were more stable at 94 GHz band. Hogan et al. (2003) describe a calibration method for 94 GHz systems which is based on the attenuation of the radar signal during rain. Protat et al. (2011) propose a method for calibrating ground based cloud radar systems by means of the spaceborne 94 GHz cloud radar CloudSat. Beside the calibration of 94 GHz radars the technique is also applicable to 35 GHz radars.

2 Target classification

Signals not only arise from hydrometeors, other particles like insects or dust yield a significant backscatter signal and can make it difficult to identify cloud layers. In these cases some kind of target classification is necessary which can be done either in combination with other instruments or by filtering techniques (e.g. Hogan & O'Connor 2004, Bauer-Pfundstein & Görsdorf 2006, Teschke et al. 2006, Löhnert et al. 2008).

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