



A CLASSIFICATION OF SOLID AND MIXED-PHASE PRECIPITATION PARTICLES BASED ON SCATTERING PROPERTIES

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The telemetering of tropospheric precipitation characteristics by means of electromagnetic waves requires profound knowledge about wave propagation and scattering and therefore about the detailed structure of precipitation particles. This knowledge is being gained by the 2D-Video-Distrometer (2DVD), a ground based precipitation gauge. The 2DVD records with high resolution the front and the side view as well as the velocity of each hydrometeor falling through the 100 cm² large sensing area. Resultant information about the fine structure of snowflakes and mixed-phase precipitation particles is required for calculating electromagnetic scattering behaviour.

By comparing 2DVD-data of different types of solid and mixed-phase precipitation particles combined with meteorological information (temperature, wind, atmospheric pressure) we found typical values for falling velocity, oblateness and particle diameter of several precipitation categories. We also show the correlation of the particle's diameter and its falling velocity for different precipitation situations. Such information provides the basis of a classification of solid and mixed-phase precipitation particles according to their scattering properties. Typical applications are precipitation-, cloud- and wind radar (for determining tropospheric weather characteristics, usually from the ground), as well as the remote sensing of precipitation fields by airborne or spaceborne instruments.