



The role of multiple scattering effects in space-borne radar-based rainfall estimates

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The first images delivered by the 94 GHz Cloud Profiling Radar on board of Cloud-Sat when passing precipitating systems have shown distinctive evidences of multiple scattering effects (e.g. no 'discontinuity' peak in the reflectivity signal at the surface range, long tails in the reflectivity profiles at apparent ranges below the surface). These features are explained in the frame of a forward polarised Monte Carlo-based radar simulator capable of treating multiple scattering effect, which has been upgraded to include the interaction with a Kirchoff surface.

The model has been applied to realistic profiles extracted from cloud resolving model simulations of different raining systems both for CloudSat and GPM configurations in order to investigate the effect of multiple scattering when dealing with space-borne radar-based rainfall estimates.