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Discussion on the implementation of Quantitative Precipitation Estimations (QPE) on operational polarimetric radars

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After decades of development and testing in the context of research, polarimetric radars are currently being introduced into operational networks, in particular for hydrological applications. Many works have shown that dual-polarisation allows 1) better identification non-precipitation echoes, 2) correction for rain-induced attenuation, 3) better identification the bright band and the hydrometeor type (i.e. rain, hail, snow, Ě), 4) calibration the radar without any external data, 5) retrieval of the appropriate Z-R relationship. The implementation of correction procedures in an operational context requires to carefully monitor the quality (bias and noise) of the basic polarimetric variables. Specifically, the influence of the radome - almost all operational radars are protected by a radome - or of nearby obstacles have to be carefully analyzed. Likewise, the quality of low-elevation data - potentially subject to beam blockage and sidelobe contamination - has to be precisely documented since they are largely used in the composition of current operational QPE products. Results regarding those issues will be presented based on data gathered by the operational C-band Trappes radar, which has been operated continuously since March 2004 in Trappes near Paris. In a second step, point-based and so-called ‘integrated’ polarimetric rain rate estimators will be discussed and illustrated.