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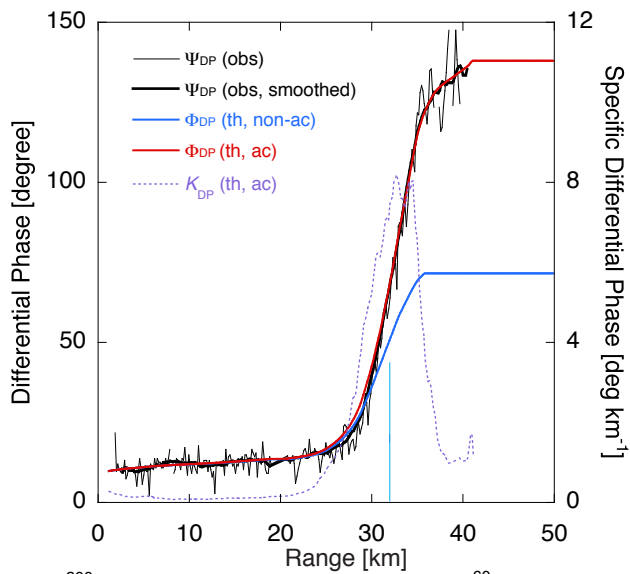


Figure 4. Radial profiles of observed Ψ_{DP} (thin black line), observed Ψ_{DP} smoothed along 20 (=3 km) gates (thick black line), theoretical Φ_{DP} without attenuation correction procedures (blue), theoretical Φ_{DP} with attenuation correction procedures (red), and theoretical K_{DP} (dashed purple line) for the azimuth of 279° at 0754 JST on 3 December 2010. The light-blue vertical line indicates the location of a disdrometer at Sekiyado.

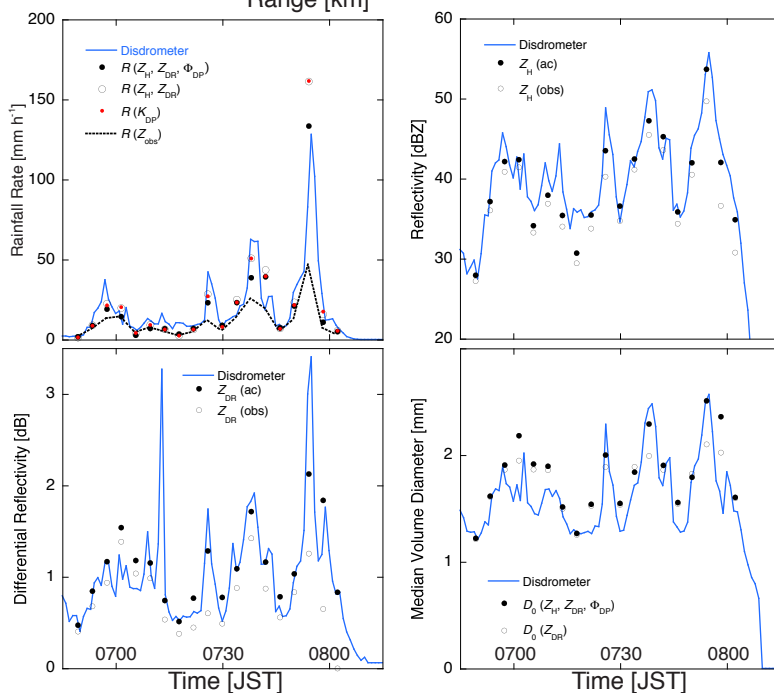


Figure 8. Time series of (a) rainfall rates, (b) horizontal reflectivities, (c) differential reflectivities, and (d) median volume diameters derived from disdrometer measurements (thin line) and estimated from polarimetric radar data (circles) at the Sekiyado station from 0645 to 0815 JST on 3 December 2010. $R(Z_H, Z_{DR})$ in (a) was estimated by use of Gorgucci (1994), and $D_0(Z_{DR})$ in (d) was derived by use of Bringi et al. (2006).

- This study proposes a new method for estimating raindrop size distribution (DSD) and rainfall rate (R) from polarimetric radar at attenuating frequency.
- Since the proposed algorithm retrieves the co-polar (A_H) and differential specific attenuation (A_{DP}) from the interrelation among the polarimetric measurements, it needs no external reference data such as 2DVD measurements for attenuation corrections.
- In addition, this method corrects not only the systematic bias in Z measurements but also the bias due to the wet radome by matching the theoretical Φ_{DP} value estimated from Z and Z_{DR} (red line in Fig. 4) with the observed value (black line) using an expanded version of an autocalibration technique (blue line: original technique) proposed by Goddard et al. (1994).
- The evaluation of the algorithm showed that the retrieved three DSD parameters of raindrops, R , Z , and Z_{DR} from actual C-band polarimetric radar data (black closed circles in Fig. 8) have fairly good agreement with those obtained by surface measurements (blue line).