Characteristics of polarimetric radar parameters of dry volcanic ash clouds

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We analyzed statistically the polarimetric radar data of 9 Sakurajima volcanic eruption clouds in 2013. All eruption clouds have a height exceeding 3000m. According to the results, Z_H has positively skewed distributions (Skewness of 1.6; mean Z_H of 9.77 dBZ and median of 7.4 dBZ), Z_{DR} has normal distributions (Skewness of 0.02; mean Z_{DR} of 1.58 dB and median of 1.6 dB), K_{DP} has positively skewed distributions (Skewness of 7.12; mean K_{DP} of 0.03 deg/km and median of 0.0 deg/km), and ρ_{hv} has negatively skewed distributions (Skewness of -1.02; mean ρ_{hv} of 0.77 and median of 0.8). Depending on time after the eruption, the average Z_H decreased from 22.3 dBZ to 6.75 dBZ while the average Z_{DR} and ρ_{hv} tended to increase from 1.24 dB to 1.67 dB, and from 0.47 to 0.83, respectively.

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