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Plain Language Summary: An algorithm is developed to detect the spurious differential phase Φ_{DP} and specific differential phase K_{DP} in the rain. The development and validation of the algorithm was conducted using the data observed by the C-band polarimetric radar aboard the research vessel Mirai during a pilot field campaign of the Years of the Maritime Continent (YMC) project. The algorithm developed in this study facilitates the quality control of Φ_{DP} and K_{DP}.

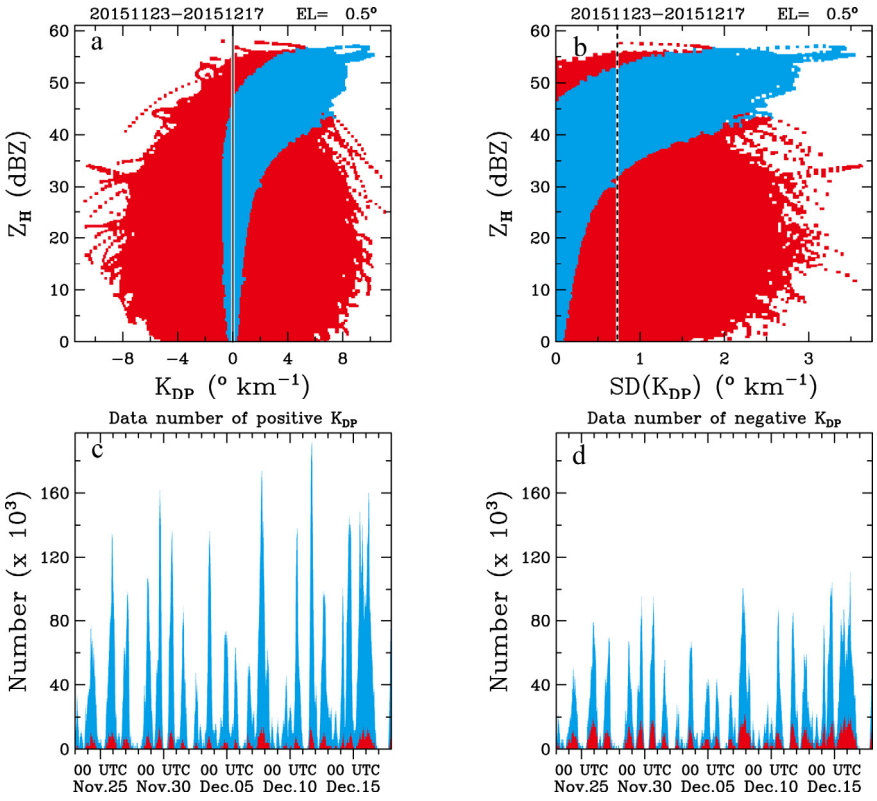

Figure 1. (a) Scatterplot of K_{DP} versus Z_H at an elevation of 0.5° for all 5998 scans from 23 November to 17 December 2015. The data associated with the spurious K_{DP} detected by the algorithm presented in this study are shown in red. (b) Same as (a) but for *SD* (K_{DP}) versus Z_H. The vertical dashed line indicates the location where *SD* (K_{DP}) = 0.73° km^{-1}. (c) Time series of the number of the observed data at an elevation of 0.5° for positive K_{DP} with Z_H values above 10 dBZ. The number of the spurious K_{DP} detected by the algorithm presented in this study is shown in red. (d) Same as (c) but for negative K_{DP}.

- The algorithm is a threshold filter that is designed based on the empirical relationship between the K_{DP} and radar reflectivity factor at horizontal polarization Z_H for raindrops.
- The positively and negatively biased K_{DP} values can be efficiently detected by this new algorithm, while quality data, especially those with high Z_H values, remain unaffected as far as possible.
- The standard deviation of the K_{DP} in areas with relatively low Z_H is also significantly reduced by applying the algorithm.