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Drop Size Distribution analysis in Sicily via optical disdrometer

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Knowledge of drop size distribution of rainfall is fundamental for rain measurement through meteorological radars. In the paper, preliminary results related to the analysis of drop size distributions obtained through an optical disdrometer in Sicily are presented. In particular, observed drop size distributions sampled at 1 minute have been analyzed to calculate the main parameters of Ulbrich probability distribution. Different estimation methods have been applied, by considering separately each minute of observation or by pooling different observations with rainfall intensities falling within a given class. Goodness of fit of Ulbrich distribution has been assessed by means of statistical tests. The results indicate that the theoretical distribution appear to fit well the experimental values. Furthermore, the terminal velocities of the drops have also been investigated, and the resulting couples of values (diameter, velocity) have been compared with the analytical expression of Atlas et al. (1973), which also appears to fit them. Finally, an analysis of the relationship between the parameters of the Ulbrich distribution with the intensity of precipitation is presented.