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Early assessment of an optical disdrometer performance

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Improving our understanding of spatial and temporal variability of precipitation may require a dense network of instruments capable of providing measurements of drop size distribution. They also have to be robust, reliable, easy to calibrate or calibration free, and inexpensive. Optical disdrometers are relatively new instruments and have the potential to meet these requirements. However, their error characteristics are not yet fully understood. In the present work the authors tried to evaluate the uncertainty of the Laser Precipitation Monitor, Thies-Model 5.4110.00.000 disdrometer on the rainfall rate and accumulation estimates. During the year of 2005, five Thies disdrometers were collocated at the Iowa City airport. With the data gathered by each disdrometer on a drop by drop basis we calculated the rainfall rates and compared for different integration intervals. We analyzed the influence of the integration interval on the correlation between the estimates from each instrument. The discrepancies of the results encouraged us to develop a calibration procedure. We developed a simple manually operated calibration device and performed the calibration of the instruments. We present our experience assembling and operating the devices and discuss the difficulties observed over one year data gathering campaign.