EMS Annual Meeting Abstracts
Vol. 14, EMS2017-524, 2017

Rain events measured by two disdrometers in Prague (Czech Republic) and their comparison

Zuzana Chládová (1), Ondřej Fišer (1,2), Karel Pitaš (1,2)

(1) Institute of Atmospheric Physics CAS, Department of Meteorology, Prague, Czech Republic, (2) University of Pardubice, Faculty of Electrical Engineering and Informatics, Pardubice, Czech Republic

In this contribution we analyse rain events from two different types of disdrometer measurements. First disdrometer is a 2D-videodisdrometer made by Joanneum Research in Graz in Austria. Rain measurement is presented by equivolumetric hydrometeor diameter, Drop Size Distribution (DSD), rain rate, fall velocity of raindrops and drop oblateness. Data are collected in the interval of 0.01 minute. The second disdrometer is Laser Precipitation Monitor V2.6 made by Thies in Göttingen in Germany. This instrument produces a parallel light beam (infrared transmitter) and the receiver measures the optical intensity by transforming into an electrical signal. This disdrometer measures intensity, fall velocity, equivolumetric hydrometeor diameter and DSD of drizzle, rain, snow and hail. Data are collected in the interval of one minute. Both disdrometers are located in the garden of the Institute of Atmospheric Physics on the southeast part of Prague.

In this contribution we first processed and analysed data from 2010–2017 period measured by the 2D-videodisdrometer. Our measurement is performed continuously. DSD plays important role in meteorology – radar reflectivity interpretation and consequent rain rate estimation, classification of precipitation types, weather forecasting, nowcasting etc. Measured DSD is parametrised and compared with the usual DSD analytical models (Exponential, Gamma model in the rain case and Cheng-English model in case of hail). First analysis of measurements has shown that Gamma DSD model should be preferred to the exponential one. We plan to search for relationships between radar reflectivity and radar reflectivity factor derived from 2D-videodisdrometer measurement, rain rate and rain kinetic energy. Because the influence of wind is about 25 % of the total rainfall kinetic energy, the relation between wind speed (wind direction) and disdrometer outputs parameters will be investigated.

Second, we compare two measurements of different disdrometers during spring and summer season 2017. Both disdrometers are located in close proximity and have the same rain conditions. Differences between measured DSD of these disdrometers will be analysed in this contribution.