EMS Annual Meeting Abstracts
Vol. 16, EMS2019-480, 2019

Sub-daily precipitation intensity: Comparison of statistics based on regular measurement and running time intervals

Anna Valeriánová and Lenka Crhová
CHMI, Climatology, Prague, Czech Republic (anna.valerianova@chmi.cz)

Sub-daily precipitation intensity is one of the most complicated climatological characteristics from the perspective of measurement and data processing but it is of a very high interest for technical practice. They are used, for example, for designing drainage networks in cities and they are also important for hydrological practice.

The number of stations with the sub-daily precipitation measurement is lower than the number of daily precipitation stations. Precipitation intensity has been regularly measured in the Czech Republic since 1898 when 18 rain-gauge recorders were put into operation. At the beginning of 2000s the measurement by rain-gauge recorders was terminated. Nowadays, automatic rain-gauges are used for the measurement.

The data from rain-gauge recorders is available in climatological database with 1-minute time resolution. The data from automatic rain gauges are transmitted to climatological database in 1-minute and 10-minute intervals (until 2010 15-minutes). Only the 10-minutes precipitation data are subject to quality control procedure.

The 10-, 30-minute, 1- and 3-hour precipitation sums will be calculated in two versions: a) based on regular 10-minutes measurement and b) based on 1-minute measurement. The selected statistical characteristics of these two datasets will be compared. In particular, return levels of short-term rainfall estimated using extreme value distributions (e.g. Generalized Extreme Value Distribution, Gumbel Distribution) will be compared for the above mentioned datasets.

On the basis of the comparison results, necessary frequency of precipitation measurement for technical applications and possibility to use the regular 10-minutes precipitation data from other organizations running their own precipitation measurement networks will be evaluated.