Rain rate generator to study rain data processing techniques

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A mathematical generator of rain rate time series was constructed. It uses a standard random function of the MATLAB code to generate typical rain rate course like in the rain gauge measurement case. It respects: random rain rate peaks between 0.2 and 200 mm/h, random duration between two peaks, random rain event duration between a few seconds to tens hours (linear course between peaks is supposed), random interfade (NO RAIN)duration between seconds to a few weeks etc. All generated rain rate time series are automatically checked to exclude non realistic ones. A simulator of rain rate series was extended by the Tipping-bucket data generator in order to generate rain data as well as the Tipping-bucket measurement. The simulated rain rates were preferred to the actual ones because of better resolution. The synthetic rainfall data were used to test newer Tipping-bucket data processing techniques and to compare it with existing methods - the rain rates are not measured directly but they are estimated through various techniques. In the contribution there are 5 methods compared through the RMSE: natural technique, usual meteorological technique, first IAP technique, novel IAP technique and TESTCOM technique. It was shown that the results obtained strongly depend on the technique of rain data processing. It is regrettable that rain data obtained from Tipping-bucket rain gauges of meteorological institutes and processed by the standard technique of meteorological services are of the lower accuracy from the rain rate point of view.