



The influence of rainfall intensity measurement errors on the climatological interpretation of historic rain series

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Systematic mechanical errors affecting the most popular rain intensity measurement instrument, namely the tipping-bucket rain-gauge (TBR), strongly depend on the measured rainfall intensity (RI) and lead to the systematic underestimation of high to severe RIs with a consequent biased estimation of extreme rain rates statistics. Furthermore, since intense rain-rates are usually recorded over short intervals in time, any possible correction strongly depends on the time resolution of the recorded data sets. We propose a simple procedure for the correction of low resolution rainfall intensity records after disaggregation at a suitable scale, so that the assessment of the influence of systematic errors on rainfall statistics become possible. The disaggregation procedure has been applied to a wide dataset of RI records at coarse resolution by using different disaggregation techniques (such as the Iterated Random Pulse algorithm and Random cascades). An ensemble of extreme value statistics, commonly used in urban hydrology practise, have been then extracted from simulated data and compared with the ones obtained after direct correction of high resolution RI series. Moreover, the influence of rainfall measurement errors on the reliability of extreme value RI statistics in space and time and on climatological analyses has been assessed.