



Micro-canonical cascade model: Analyzing parameter changes in the future and their influence on disaggregation results

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Rainfall time series with a high temporal resolution are needed in many hydrological and water resources management fields. Unfortunately, future climate projections are often available only in low temporal resolutions, e.g. daily values. A possible solution is the disaggregation of these time series using information of high-resolution time series of recording stations. Often, the required parameters for the disaggregation process are applied to future climate without any change, because the change is unknown.

For this investigation a multiplicative random cascade model is used. The parameters can be estimated directly from high-resolution time series. Here, time series with hourly resolution generated by the ECHAM5-model and dynamically downscaled with the REMO-model (UBA-, BfG- & ENS-realisation) are used for parameter estimation. The parameters are compared between the past (1971-20000), near-term (2021-2050) and long-term future (2071-2100) for temporal resolutions of 1 h and 8 h.

Additionally, the parameters of each period are used for the disaggregation of the other two periods. Afterwards the disaggregated time series are analyzed concerning extreme values representation, event specific characteristics (average wet spell duration and amount) and overall time series characteristics (average intensity and fraction of dry spell events).

The aim of the investigation is a) to detect and quantify parameter changes and b) to analyze the influence on the disaggregated time series. The investigation area is Lower Saxony, Germany.