

# Multi-site High-frequency Stochastic Precipitation Generator Using Censored Skew-Symmetric Distributions

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Recent studies of stochastic weather generators call for an accurate model for high-frequency precipitation data due to the improvement of measuring instrument. In comparison with common (daily) precipitation data, high-frequency data is more zero-inflated, skewed, heavy-tailed, and with strong dependence between occurrence and intensity. Therefore, classical methodologies that either model precipitation occurrence unconditionally or assume the precipitation amount is from a transformed Gaussian distribution may not be appropriate. In this work, we propose a new multisite precipitation generator using left-censored non-Gaussian vector autoregression model, where the random errors follow skew-symmetric distributions. The proposed stochastic precipitation generator not only drives the occurrence and intensity simultaneously using a single model, but also possesses nice interpretations both physically and statistically. We also apply this stochastic generator to 30-sec precipitation data from the dense gauge network in Lausanne.