

Einladung zu einem Vortrag in der

AG STOCHASTIK

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spricht über das Thema

A stochastic generator for high-resolution spatio-temporal extreme rainfall

Modeling precipitation and its accumulation over space and time is essential for urban flood risk assessment. We present a spatio-temporal stochastic framework for high-resolution extreme rainfall, developed from several years of observations collected by the OMSEV rain-gauge network in Montpellier, southern France. The proposed model combines realistic marginal behavior with a flexible dependence structure. At the point level, rainfall intensities are described by the Extended Generalized Pareto Distribution (EGPD), which captures both moderate and extreme rainfall without requiring explicit threshold selection. Extreme spatio-temporal dependence is then modeled using an r -Pareto process with an underlying Gaussian structure, within the peaks-over-threshold framework. To represent the horizontal displacement of rainfall cells, the dependence model relies on a non-separable spatio-temporal variogram including episode-specific advection, with empirical velocities derived beforehand from radar reanalysis data. Based on a catalog of observed extreme space-time rainfall episodes, the variogram parameters are estimated through a new composite likelihood approach based on bivariate joint exceedance indicators. The resulting stochastic generator accurately reproduces the spatio-temporal structure of extreme rainfall observed in Montpellier and enables realistic scenario generation, with the final objective of coupling simulated rainfall events with a mechanistic water-flow model for flood risk analysis.

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Die Dozentinnen und Dozenten der Stochastik