



Modeling rainfall distribution using a thresholded transformed latent Gaussian process

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There is a great need for spatio-temporal modelling of precipitation as input data to hydrological models. Traditional methods for precipitation interpolation, has an unsatisfactory way of recreating areas with no rainfall. The development and increasingly use of area distributed models and energy balanced equations, requires a more correct calculation of both the amount and distribution of precipitation.

This study demonstrates a method for modeling rainfall using a thresholded transformed latent Gaussian process. The method involves transformation of the rainfall at each gauging station to a latent Gaussian variable by the use of a monotonic function. Then stochastic simulation is used to generate realisations of rainfall for each time step in the distributed hydrological model.

The method is compared to traditional interpolation methods for a Norwegian study area with seven gauging stations.

References: Allcroft, D. J., Glasbey, C. A., 2003: A latent Gaussian Markov random field model for spatio-temporal rainfall disaggregation JRSSC, volume 52 2003, p. 487-498