Statistical downscaling in operational rainfall forecast

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Abstract.  
The prediction of the small-scale spatio-temporal pattern of intense rainfall events is crucial for flood risk assessment in small catchments and urban areas. In the absence of a full deterministic modelling of small-scale rainfall, it is common practice to resort to the use of stochastic downscaling models to generate ensemble rainfall predictions to be used as inputs to rainfall-runoff models. We discuss a spatio-temporal downscaling procedure based on a non-linear transformation of a linearly correlated (gaussian) field that reproduces the scaling properties (if any) of the rainfall pattern and can be easily linked with meteorological forecasts provided by limited area meteorological models. We believe that this approach represents a significant improvement over commonly available downscaling models used for operational purposes.