Geophysical Research Abstracts,
Vol. 11, EGU2009-8769, 2009
EGU General Assembly 2009


# Analysis of Spatial Extreme Rainfalls

S. Padoan, M. Parlange, and C. Ancey

Laboratory of Environmental Fluid Mechanics and Hydrology, Ecole Polytechnique Federale de Lausanne, Lausanne (simone.padoan@epfl.ch)

Much work has been done in the context of spatial analysis for multivariate extremes (MEs). Often, the objective is to quantify and characterize the extremal behavior of environmental events like rainfall-levels, over a spatial domain. We look at the issue of spatially occurring rainfall extremes, which has become an important topic due to concerns over climate change. A suitable class of models is
provided by max-stable processes (MSPs) as a continuous space extension of ME value models. Statistical inference procedures based on MSPs have been proposed [1], leading to a class of models that might be appropriate for extremal aspects of spatial rainfall processes. We focus on models for temporal series of componentwise annual maxima of precipitation recorded at a number of sites within a contiguous
region. Likelihood methods for such models are complicated by the intractability of density functions in all but the most trivial cases. In families where pairwise densities are available, we show the suitability of inference based on composite likelihood. The procedure is sufficiently reliable and versatile to permit the simultaneous modelling of marginal and dependence parameters in the spatial context at a moderate computational cost.
We illustrate the utility of this methodology by the analysis
of Switzerland precipitation extremes.

Keywords: Max-stable processes; Extreme value theory; Rainfall; Composite
likelihood.
References

[1] Stuart Coles(1993) Regional modelling of extreme storms via MSP.JRSS.B 55,p.797-816