



Independent components analysis: an application to the study of rainfall field in space and time

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The notions of “space structure”, “correlation” and “scale” play a central role in Hydrological sciences and, in particular, in the survey and modelling of rainfall fields in space and time. We present an ensemble of techniques for the breadth to the non-linear case of the principal components analysis of space-time rainfall field, by mean of ICA (Independent Components Analysis) methods. Such techniques base on the minimization of global correlation statistics and have been successfully applied in several different research fields among which, non-linear signal analyses and image recognition methods. Nevertheless, they seem to be a valid response to the need to model the rainfall field correlation structure not only by linear methods. The analysis is completed with some examples of the application of ICA techniques to the analysis of rainfall intensity records at the ground.