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Regional patterns of extreme behavior of daily rainfall in France

P. Bernardara (1), J. Gailhard (2), A. Dupeyrat (1), E. Paquet (2), R. Garçon (2), F Hendrickx (1)

(1) EDF, R&D, LNHE. 6 quai Watier 78401 Chatou cedex, France (pietro.bernardara@edf.fr / Fax : +33130878109 / Phone : +33130877720), (2) EDF, DTG, Grenoble, France.

Extreme Rainfall knowledge is crucial for the hydro-meteorological analysis of flood risk. In particular, the dimension of dam spillway can be calculated via hydro-meteorological modelling. Moreover, the knowledge of spatial behaviour of extreme rainfall can upgrade the precision of project estimation, it can help to validate frequency analysis techniques and it can help to map the regions more exposed to risk. In this framework, the frequency analysis of a wide database of daily rainfall series located in the mountainous part of France has been newly completed in a collaboration work between EDF DTG and R&D. We focus here on the results obtained on the spatial distribution of extreme rainfall via two different statistical approaches. Firstly we fit an exponential distribution on meteorologically homogeneous sub-sample of daily rainfall, then we fit a Generalized Pareto Distribution on the whole daily rainfall series. The two different statistical approaches give coherent spatial patterns even though some discrepancies in quantiles intensity are observed