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Regional patterns of flood and rain extreme value index in the South of France.

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Extreme events of rainfall and flood are more and more of great societal concern due to the heavy damages that they cause.

Even though the extreme value theory and the practical analysis of extreme value got in recent past wide attention; some issues are still open and some problems remain unsolved, among them the extreme value model to choose for flood and rainfall analysis

The tail behavior of the extreme value distribution is investigated thought the estimation of the shape parameter of the Generalized Pareto and GEV distributions. We test and compare several estimators (Hill estimator and some variants), sampling techniques (peak over a threshold and annual maxima) and extreme value models (Gumbel (GEV type 1), Fréchet (GEV type 2), multifractal models); on a large dataset of rainfall and runoff in the Mediterranean region of France. The resulting extreme value index estimates exhibit regional patterns. These patterns are used to define a regional risk index that could be particularly useful to support and drive policy makers and decision makers. These preliminary results create a knowledge base to improve the debate on the physics that drive these extreme phenomena, i.e. rain variability vs. basin response and to test physical model and theory.