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Assessing the severity of flash-floods events

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Ramos et al., (2005) have shown the relations between the spatio-temporal scale of severe rainfall events and their social and economical impact. They propose to represent the maxima return periods of storms as a function of duration and impacted surface in a so-called "Severity Diagram". To compute the Severity Diagram of an event, one needs to compute statistics of long point and spatial rainfall series in the region of analysis. Dealing with point rainfall, only daily rainfall series are sufficiently long for correctly evaluating the occurrence of extreme events. Spatial rainfall can be obtained by point rainfall interpolation, but only when the raingage density is higher than the typical storm size at a given duration. Unfortunately, this is not the case for rainfall at durations lower than 6-12h. To overcome these impediments, a framework including geostatistics, extreme analysis and multi-scaling analysis for reconstructing heavy rainfall series at various spatio-temporal scales is being studied, and will be described. Finally, we will show the first applications of Severity Diagrams for comparing the observed rainfall with the outcomes of various mesoscale-models in some relevant storms occurred in South-Eastern France.