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Accurate physiognomic and dynamic characterisation of rainfall events in urban area by spatial interpolation : the case of the greater Lyon

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Accurate characterization of rainfall over the Greater Lyon urban area (the second biggest urban area in France with one million and a half inhabitants) is one of the purposes of the Laboratoire de Climatologie Risques Environnement (Université Lyon III, France), through the research programs of the Field Observatory for Urban Water Management. This Observatory is a scientific laboratories research federation situated in Lyon, in order to manage water resources in built-up region, from rainfall to sewage treatment. Concerning rainfall analyses, investigations are made from radar data and rain gauge network data association. After an evaluation of interpolation methods efficiency, the first results obtained from extreme rainfall events spatial interpolation correlated with sewer network dysfunctions have pointed out a weak influence of local factors in rainfall distribution, such as urban heat convection for example. These results show, for each extreme rainfall event, a directional influences on the semivariogram (covariance), known as anisotropy, of about 40˚N, from the South-west to the North-East of Greater Lyon. Thanks to these results, the use of punctual rainfall data spatial interpolation with radar data promises really encouraging future perspectives (in progress), as much on the scientific basis (precise characterization of rainfall, dynamic origin and evolution of phenomena), as on the operational basis (sewer system improvement, extreme rainfall event forecasting, alert procedures).