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Study on multifractal modeling of rainfall

Elena Volpi (1), Federico Lombardo (1), Fabio Russo (2), Francesco Napolitano (2), and Luca Baldini (3)

(1) Dipartimento di Scienze dell'Ingegneria Civile, Università degli Studi – Roma Tre, Italy, (2) Dipartimento di Idraulica, Trasporti e Strade, Sapienza Università di Roma, Italy, (3) Istituto di Scienze dell'Atmosfera e del Clima, Consiglio Nazionale delle Ricerche, Italy

The identification of the spatial structure of rainfall is widely recognized as a key issue in the hydrological applications. An approach to this problem is based on the empirical detection of some regularities in hydrological observations, such as the scale-invariance properties of rainfall (e.g. [1]). Scaling properties can provide simple relationships to link the statistical distribution of the rainfall process at different spatial and temporal scales, in the ranges of which the power-law assumption can be verified [2]. However, it is very difficult if not impossible to be able to properly capture the high spatial variability of rainfall fields with traditional rain gauge networks, while modern weather radars are, potentially, an instrument capable of meeting this need because of the fine spatial resolution of radar data.
This work focuses on the analysis of the scaling properties of rainfall in space by using data from a high density rain gauge network and from a weather radar both covering the urban area of Rome. The aim of the study is the identification of spatial scaling regimes, their ranges of validity, and the evaluation of the corresponding scaling properties.

REFERENCES

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