



Multifractals methods applied to the rain forecasting using radar data

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In the emergency situations, the hydrological systems of early warning and forecast require more and more detailed space-time information and reliable short term forecasts. The current weather forecasting models or the statistical methods of radar and satellite image processing do not fulfil all these requirements. They are hyper parameterized, they seldom take into account of the strongly nonlinear dynamics of the stormy cells and their implementation is time consuming. The multifractal approach, physically based on cascade processes, takes into account the hierarchy of the structures and their nonlinear interactions on a large range of space-time scales, as well as the space-time anisotropy. The advantage of this approach is that it utilizes only a very limited number of parameters, which moreover have a strong physical significance. We present here a procedure of multifractal forecast of rain. Radar data are used to determine from the past fields, the generator of the cascade. We compare two models based on multifractal forecast, respectively a stochastic approach and a deterministic approach for the cascade generator.