7.4 WHEN IS RADAR DATA CALIBRATION BY IN-SITU NETWORKS MISLEADING?

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In the framework of the EU project RainGain, a dual-polarization X-band radar has been installed on the site of Ecole des Ponts ParisTech (ENPC). With respect to the C-band radar data of Mto-France of Trappes, it gives access to the complex patterns of precipitation at much finer scales. This has enabled us to test and compare different algorithms using single and/or double polarization and their comparison in the context of different studies. These studies have furthermore shown that adjustment of radar measures on in-situ networks does not necessarily play a positive role. Considering that precipitation fields are extremely variable over a wide range of space-time scales, we use the Universal Multifractal (UM) framework to confront the highly non-Gaussian statistics of space-time structures of precipitation measured by the radars with that partial information captured by the in-situ measurement networks. A criterion for a compatibility of these measures is based on the intersection theorem between two multifractal fields. More specifically, we first evaluate the fractal dimension of the in-situ network, as well as the UM parameters (lfa and C1) of the precipitation measured by the radar. Then the semi-theoretical results suggest that a conditioning by the in-situ network could be rather counterproductive for rainfall events with C1/(lfa -1) being weaker than the co-dimension of the fractal in-situ network. Indeed, in this case the in-situ network only introduces a bias in the rainfall estimates instead of allowing to refine them.