



## **PREPHIX : PREcipitations and microPhysical studies with a High resolution X-band radar: Calibration with a bin microphysical model and supporting measurements**

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The primary goal of this project is to develop a robust low cost X-band radar in order to localize and quantify precipitations with high spatial and temporal resolution over areas equivalent to urban domains or small catchments basins (about 60 meters in range, 30 seconds in time with a maximum range of about 20 kilometers). This project is carried under a collaboration between the “Max-Planck-Institut für Meteorologie” in Hamburg and the “Laboratoire de Météorologie Physique” (LaMP) in Clermont-Ferrand.

At LaMP, the algorithms to provide reliable rainfall rate estimates will be developed. To do so, complementary measurements from a set of micro-rain radars and a network of rain-gages and disdrometers will be used. In particular, the micro rain radars which can retrieve vertical profiles of drop size distribution and the associated reflectivity will allow performing direct comparisons with the X-band radar volume samples. Thus, the primary scientific objectives of the experimental set-up are to study the heterogeneity of rain and the dynamics of the precipitating structures, and to develop the corresponding Z-R relationships for improved rain rate restitution.

A second important aspect of this work is to use the detailed cloud modeling available at LaMP. Simulations of precipitating clouds in highly resolved 3D dynamics will allow predicting the spectra of rain drops and precipitating ice particles. Radar reflec-

tivities determined from these model studies will be compared with the observations in order to better understand which shape factor should be applied for the radar algorithms as a function of the type of precipitating cloud. Likewise these comparisons between the modeled and the observed reflectivity will also give us the opportunity to further improve our model microphysics and the parameterizations for meso-scale models.