

## **4.2 High resolution rainfall estimates based on X-band radar technology for urban hydrological modelling**

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Hydrological analysis of urban catchments requires high resolution rainfall and catchment information because of the small size of these catchments, high spatial variability of the urban fabric, fast runoff processes and related short response times. Rainfall information available from traditional radar and rain gauge networks does not meet the relevant scales of urban hydrology. A new type of weather radars, based on X-band frequency and equipped with Doppler and dual polarimetry capabilities, promises to provide more accurate rainfall estimates at the spatial and temporal scales that are required for urban hydrological analysis. In the framework of the RAINGAIN project, radars of this type will be installed in two pilot locations, Paris and Rotterdam. The project comprises of four pilot locations in total with various characteristics of weather radar equipment, ground stations, urban hydrological systems, modelling approaches and requirements. Details of the rainfall measurement networks in the pilots will be given, including specifications the newly acquired X-band radars and selected locations for installation in the urban environments. The availability of high resolution weather data augments requirements with respect to the resolution of hydrological models and input data. Urban hydrological models typically consist of a rainfall-runoff module and a hydraulic module for the underground pipe networks. These hydrodynamic models currently have insufficient resolution to incorporate high resolution rainfall. This has led to the development of fully distributed hydrological models, which will be tested in several pilots of the RainGain project. Comparisons will be made between the pilots to analyse sensitivities of the different urban catchments to high resolution rainfall characteristics. Hydrological characteristics of the RainGain pilots will be given as well as foreseen inter-pilot hydrological comparisons based on fully distributed modelling. Challenges with respect to acquisition of high resolution hydrological data will be accentuated.