



Urban rainfall estimation employing commercial microwave links

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Urban areas often lack rainfall information. To increase the number of rainfall observations in cities, microwave links from operational cellular telecommunication networks may be employed. Although this new potential source of rainfall information has been shown to be promising, its quality needs to be demonstrated more extensively.

In the Rain Sense kickstart project of the Amsterdam Institute for Advanced Metropolitan Solutions (AMS), sensors and citizens are preparing Amsterdam for future weather. Part of this project is rainfall estimation using new measurement techniques. Innovative sensing techniques will be utilized such as rainfall estimation from microwave links, umbrellas for weather sensing, low-cost sensors at lamp posts and in drainage pipes for water level observation. These will be combined with information provided by citizens in an active way through smartphone apps and in a passive way through social media posts (Twitter, Flickr etc.). Sensor information will be integrated, visualized and made accessible to citizens to help raise citizen awareness of urban water management challenges and promote resilience by providing information on how citizens can contribute in addressing these. Moreover, citizens and businesses can benefit from reliable weather information in planning their social and commercial activities. In the end city-wide high-resolution rainfall maps will be derived, blending rainfall information from microwave links and weather radars. This information will be used for urban water management.

This presentation focuses on rainfall estimation from commercial microwave links. Received signal levels from tens of microwave links within the Amsterdam region (roughly 1 million inhabitants) in the Netherlands are utilized to estimate rainfall with high spatial and temporal resolution. Rainfall maps will be presented and compared to a gauge-adjusted radar rainfall data set. Rainfall time series from gauge(s), radars and links will be compared.