



## **Estimating rainfall with microwave links. Insight from an experimental setup in Luxembourg-City**

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Hydrological predictions in fast reacting systems such as urban environments require short term, high resolution quantitative rainfall estimates. Traditional rainfall measurement instruments such as raingauges provide only a limited spatial coverage of the rainfall event, and the uncertainties associated to rainfall estimation can be relevant. Also weather radars are subject to important sources of uncertainties, including the fact that they measure at relatively high altitudes, where the characteristics of precipitation can differ substantially from those at the soil surface. Microwave links represent a promising technique for rainfall estimation, compensating for many of the limitations of other techniques. Although the potential of this microwave links is known for decades, renewed interest is generated by the use of these instruments for mobile phone communication.

An experimental setup in Luxembourg City uses dedicated antennas on two separate links. The antennas have been operational for one year, and several events have been collected. The microwave links are compared with a dense network of raingauges, which have been displaced in intermediate positions between the links. Comparison of the two data sources shows provides insights on the potential of microwave links for rainfall estimation. We show that microwave links are able to provide accurate rainfall measurements, particularly for high intensity rainfall events. For low intensities however, the accuracy of the measurements decreases, which indicates that these instruments are best used in combination with raingauges.