

## 8.9 THE CITY OF SÃO PAULO (BRAZIL) AS A TESTBED OF RAINFALL ESTIMATES FROM COMMERCIAL MICROWAVE LINK NETWORKS

M.F. RIOS GAONA<sup>1</sup>, A. OVEREEM<sup>1,2</sup>, H. LEIJNSE<sup>2</sup>, T. RAUPACH<sup>3</sup>, R. UIJLENHOET<sup>1</sup>

<sup>1</sup> Hydrology and Quantitative Water Management Group, Wageningen University, the Netherlands

<sup>1</sup> R&D Observations & Data Technology, Royal Netherlands Meteorological Institute, the Netherlands

<sup>3</sup> École Polytechnique Fédérale de Lausanne EPFL, Lausanne, Switzerland  
feliperios@gmail.com

Rainfall estimates from commercial microwave link (CML) networks are path-averaged retrievals from the attenuation of the electromagnetic signals that propagate between cell phone towers. This alternative technique of rainfall estimation has gained attention from the hydrometeorological community, given its higher spatiotemporal resolution with regard to more standard sensors such as gauge networks and satellites, for instance. Accurate and high-resolution rainfall estimates are valuable in several hydrological applications as they offer a better understanding of short-lasting and heavy rainfall responsible for flash floods, for instance, which can exert a tremendous impact on society's welfare.

This study evaluates CML rainfall estimates for a subtropical climate, namely, for the city of So Paulo (Brazil). First, we use the open-source R package RAINLINK (<https://github.com/overeem11/RAINLINK>) to retrieve rainfall rates from attenuation measurements of ~200 CMLs located in the metropolitan area of So Paulo. Then, we evaluate the CML rainfall estimates against a dense automatic gauge network (~100 gauges), for ~3 months (October 2014 to January 2015).

The evaluation of (individual) CML estimates against collocated gauge observations yields promising results, as rainfall retrievals from ~20 CMLs (~1/10 of the CML network) showed a correlation larger than 0.6 and a relative bias smaller than 25 %. Rainfall estimation for a subtropical climate is highly relevant, given that many countries with few rainfall observations are located in this climate zone.