

Rainfall estimation employing commercial microwave links from São Paulo, Brazil

Manuel Felipe Rios Gaona (1,4), Aart Overeem (1,2), Hidde Leijnse (2), Tim Raupach (3), and Remko Uijlenhoet (1)

(1) Hydrology and Quantitative Water Management Group, Wageningen, the Netherlands, (2) Royal Netherlands Meteorological Institute, De Bilt, the Netherlands, (3) EPFL Swiss Federal Institute of Technology Lausanne, Lausanne, Switzerland, (4) IIHR—Hydroscience and Engineering, Iowa City, United States

Rainfall estimation from commercial microwave link (CML) networks has gained a lot of attention from the hydrometeorological community in the last decade. Path-averaged rainfall intensities can be retrieved from the signal attenuation between cell phone towers. Such a technique offers rainfall retrievals at high spatiotemporal resolutions, which are very important for urban hydrology, given the often deadly impact of flash floods to society.

This study evaluates CML rainfall retrievals for a subtropical climate. Rainfall estimation for subtropical climates is highly relevant, since many countries with few surface rainfall observations are located in such areas. The evaluation is done for the Brazilian city of São Paulo. The open-source R package RAINLINK (<https://github.com/overeem11/RAINLINK>) is used to retrieve rainfall intensities from attenuation measurements. We evaluate 149 CMLs in the São Paulo metropolitan area against a dense automatic gauge network for 81 days between October 2014 and January 2015. Comparison of individual CML rainfall estimates with collocated gauge observations shows mixed results, and underpins the importance of good CML meta data. The results for city-average rainfall are promising.