

13.3 COMMERCIAL MICROWAVE LINKS FOR RAINFALL MONITORING: A NATION-WIDE VALIDATION STUDY IN THE NETHERLANDS

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Commercial microwave links are installed and maintained for the purpose of telecommunication. Hydrometeors between transmitting and receiving antennas cause the microwave signal to be attenuated. From signal attenuation, the path averaged rainfall intensity can be calculated. A dataset of instantaneously logged signal power in almost 2000 unique links in The Netherlands over 7 months was analyzed. Rainfall intensities were calculated with the RAINLINK-package with an additional pre-processing module, enabling the package to be applied on instantaneously logged data. Validation was done by comparing rainfall intensities per link with the path averaged rainfall intensity according to a gauge-adjusted radar product. Polarization, signal frequency and link location were shown not to be relevant factors for the error in link rainfall observation. The performance of the links was better during periods of heavy rainfall and improved for longer aggregation intervals. Errors were largest for path lengths shorter than 2 km, observations during the late night and early morning, and observations during colder months (when solid precipitation could occur). This validation study helps determine the accuracy of a rainfall observation from instantaneously logged commercial microwave links based on known factors of the observation, such as path length, time of measurement and rainfall type.