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Validation study of nationwide rainfall observations from commercial microwave links in the Netherlands

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Accurate rainfall observations are vital for hydrological purposes, though they are sparse or lacking in large parts of the world. Sparsely gauged populated areas often do have networks of microwave links that are installed and maintained for the purpose of telecommunication. From signal attenuation due to rain drops, the link path averaged rainfall intensity can be determined. A microwave link network of 1936 links in the Netherlands over a period of 7 months was evaluated. This is the first study of a nationwide network that samples instantaneously. Rainfall intensities over link paths were determined with the RAINLINK-package with an additional preprocessing module, in which the parameters were calibrated for the new input type. Validation was done with path-averaged gauge-adjusted radar measurements. The dependence of the error in rain observations to the factors path length, signal frequency, polarization and time of day was evaluated. This showed that the error was highly variable, though larger for short path lengths.