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Improving rainfall monitoring using commercial microwave link data in Burkina Faso: Results from three years of processing

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Commercial Microwave Link (CML) data can provide important rainfall information, in particular in regions with low density of rain gauges and with no radar coverage. We have set up and operate a CML data acquisition (DAQ) system for Burkina Faso and report on the first larger scale analysis of the derived rainfall information.

Our real-time DAQ system started as a pilot project covering only eight CMLs and was gradually extended. For the monsoon season 2020 and 2021 it collected data for more than 1000 CMLs in Burkina Faso with a temporal resolution of one minute. Our first analysis is focusing on the 300 CMLs which operate in the frequency range between 11 GHz and 13 GHz in and around the city of Ouagadougou, the capital of Burkina Faso. We carry out a comparison with official daily rain gauge data, both for individual CMLs as well as for CML-derived rainfall maps. Our results for the period of the 2019, 2020 and 2021 rainy season indicate good performance of the CML rainfall information, with a Pearson correlation coefficient of 0.8 and higher.

The processing of the longer CMLs in the frequency range between 7 GHz and 9 GHz, which connect the urban centers in Burkina Faso, currently is in progress. To tackle the challenge of noisy dry periods we are investigating the use of cloud cover and cloud type information from MSG SEVIRI data.