

## Satellite microwave link open data for rainfall estimation

*Wednesday, June 25, 2025 3:15 PM (45 minutes)*

Opportunistic rainfall data collected through satellite microwave links (SML), such as the ones providing TV-SAT signals from Ku-band geostationary satellites, have the potential to complement conventional sensors, due to their flexibility and the relatively low-cost of the receiving equipment. However, opportunistic data must be properly processed and validated against ground truth. To this aim, the availability of large datasets of such data is crucial. This contribution presents an open SML dataset, courteously provided by the French company HD Rain, including 215 SMLs deployed in Southeastern France. The raw data are the received signal level (RSL) by each sensor expressed in dBm units and they cover a five month observation period from August to December 2022. Concurrent rain gauge and radar data from the Meteo-France operational network are provided as well. The radar data are aggregated in such a way that they spatially fit SML rainfall estimates, i.e. spatial averages across the propagation path. SML data provide indirect rainfall measurements based on the decrease of the RSL produced by raindrops falling across the path. As rain covers only a small fraction of the entire path from the satellite to ground, the height above ground where ice particles have melted into raindrops is a crucial input to derive rainfall estimates from SML data. Rain height data are supplied as well and a few techniques to derive this quantity are discussed.

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**Session Classification:** Coffee Poster Session Tuesday

**Track Classification:** OS data acquisition, management & standardization