

## Assessment of GPM era products against high resolution rain maps from Commercial Microwave Links and radar in Tropical areas.

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The lack of reliable, validated high resolution rain maps, has limited the detailed assessment and validation of satellite based rainfall estimates over most of the Inter-Tropical zone. The problem is acute in Africa and to a lesser extent, in South America.

Here we use high resolution rain maps (15 minutes time step ; kilometeric resolution) from two type of sensors : weather radars and commercial microwave links (CML). These ground validation (GV) sets could be derived for two types of eco-climatic zones : moist tropical and dry tropical. Two semi-arid sites are located in Niger, Sahel and Ceara, Nordeste Brasil ; The Cameroun and French Guyana sites are representative are moist conditions.

Weather radar data is available in Ceara and French Guyana, they have been carefully calibrated and validated prior to being used as GV. In the african sites, the reference rainfall maps are obtained thanks to opportunistic data, from the cellular phone network. It has been shown before that the signal fluctuations between telecom antennas, for radio-links operating in microwave frequencies, are well related to the rainrate over the link. On this basis rainfall can be estimated over a network if data about transmitted (TSL) and received (RSL) signal levels is collected at regular (and short) time steps. Here, several hundreds of these CMLS were used to derive 15 minutes/kilometric rainmaps and compare them with satellite products.

The focus is on two GPM era high resolution rainfall products : GSMAP and IMERG. The final gridded and intermediary products (instant rain rates based on PMW or IR) are assessed against the GV – considering the uncertainty of the GV itself. The similarities and differences in performances among the sites and eco-climatic contexts are analyzed.