



Presentation of the EPSAT-SG method and comparison with other satellite precipitation estimations in the frame of Precip-AMMA

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Most recent satellite precipitation algorithms are combining as many data sources as possible: microwave data from LEO satellites, infrared data from GEO satellites and ground data provided by radars or raingauges.

The EPSAT-SG* method developed at LMD within the framework of AMMA** combines MSG, TRMM precipitation radar (PR) and GPCP-1dd data. In a first stage, rainfall probabilities are computed from MSG multi-spectral data and from coinciding TRMM-PR data through a feed forward neural network. A "rainfall probability map" is then produced for each quarter-an-hour MSG image. In a second stage, daily rainfall efficiency maps are computed merging GPCP-1dd information with the probabilities using a rescaling procedure. Eventually combining efficiencies and probabilities data derives rainfall amount estimates. The EPSAT-SG estimates are thus produced with the MSG very high space and time resolution (3 kilometers and 15 minutes). However, in order to have a reasonable accuracy and to fit the final-user resolution requirements, the rainfall estimates are integrated on appropriate scales to provide the final EPSAT-SG product.

In the framework of AMMA, an inter-comparison exercise over West Africa including the EPSAT-SG estimates has been conducted by the Precip-AMMA group and supervised by Agrhymet. The rainfall estimates have been validated using the krigged rain fields obtained with the raingauge data from the nine Sahelian countries, provided by

AGRHYMET and IRD during the 2004 - 2006 rainy seasons. As validation studies demonstrate the poor reliability of satellite rainfall estimates provided at high resolution, the comparison was made only for dekads at different spatial resolutions. The validation exercise concerned the EPSAT-SG product and various satellite methods including GPI, GPCP, MPE and CMORPH.

* EPSAT-SG : **E**stimation des **P**récipitations par **S**atellite – **S**econde **G**énération

** AMMA : **A**frican **M**onsoon **M**ultidisciplinary **A**nalysis