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The TAMORA algorithm: satellite rainfall estimates over West Africa using multi-spectral SEVIRI data

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Abstract. A multi-spectral rainfall estimation algorithm has been developed for the Sahel region of West Africa with the purpose of producing accumulated rainfall estimates for drought monitoring and food security. Radar data were used to calibrate multi-channel SEVIRI data from MSG, and a probability of rainfall at several different rain-rates was established for each combination of SEVIRI radiances. Radar calibrations from both Europe (the SatPrecip algorithm) and Niger (TAMORA algorithm) were used. 10 day estimates were accumulated from SatPrecip and TAMORA and compared with kriged gauge data and TAMSAT satellite rainfall estimates over West Africa. SatPrecip was found to produce large overestimates for the region, probably because of its non-local calibration. TAMORA was negatively biased for areas of West Africa with relatively high rainfall, but its skill was comparable to TAMSAT for the low-rainfall region climatologically similar to its calibration area around Niamey. These results confirm the high importance of local calibration for satellite-derived rainfall estimates. As TAMORA shows no improvement in skill over TAMSAT for dekadal estimates, the extra cloud-microphysical information provided by multi-spectral data may not be useful in determining rainfall accumulations at a ten day timescale. Work is ongoing to determine whether it shows improved accuracy at shorter timescales.

■ Full Article in PDF (PDF, 595 KB)

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