Geophysical Research Abstracts,
Vol. 11, EGU2009-1458, 2009
EGU General Assembly 2009

Satellite rainfall monitoring over Africa for food security, using multi-channel MSG data

R. Chadwick (1), D. Grimes (1), R. Saunders (2), T. Blackmore (2), and P. Francis (2)
(1) Department of Meteorology, University of Reading, UK, (r.s.chadwick@rdg.ac.uk), (2) UK Met Office

Near real-time rainfall estimates are crucial in sub-Saharan Africa for a variety of humanitarian and agricultural purposes. However, for economic and infrastructural reasons, regularly reporting rain-gauges are sparse and precipitation radar networks extremely rare. Satellite rainfall estimates, particularly from geostationary satellites such as Meteosat Second Generation (MSG), present one method of filling this information gap, as they produce data at high temporal and spatial resolution.

An algorithm has been developed to produce rainfall estimates for Africa from multi-channel MSG data. The algorithm is calibrated using precipitation radar data collected in Niamey, Niger as part of the African Monsoon Multidisciplinary Analyses (AMMA) project in 2006, and is based on an algorithm used operationally over Europe by the UK Met Office. Contingency tables are used to establish a statistical relationship between multi-channel MSG data and probability of rainfall at several different rain-rate magnitudes as sensed by the radar. Rain-rate estimates can then be produced at a variety of spatial and temporal scales, with MSG scan length (15 minutes) and pixel size (3-4km) as the lower limit.

Results will be presented of a validation of this algorithm over the Sahel region of Africa. Rainfall estimates from this algorithm, processed for 2004, will be validated against gridded rain-gauge data at a 0.5 degree and 10 day timescale suitable for drought monitoring purposes. A comparison will also be made against rainfall estimates from the TAMSAT algorithm, which uses single channel IR data from MSG, and has been shown to perform well in the Sahel region.