Title: Improvements in satellite rainfall estimation for enhanced long-term rainfall monitoring and early warning over Africa

Authors: R. Maidment, E. Black (TAMSAT Group)

Contact: r.i.maidment@reading.ac.uk; e.c.l.black@reading.ac.uk

It is well known that the African rainfall climate is highly variable, both in space and time, with many African societies poorly equipped to manage such variability. Access to long-term and regularly updated rainfall information is therefore essential in both drought and flood monitoring and assessment of long-term changes in rainfall. Since gauge records alone are too sparse and inconsistent over time across many parts of Africa, satellite-based records are the only viable alternative, especially in regions with little or no gauges. The longevity of the Meteosat programme, commencing in the late 1970s and running to the present day, thus provides 40 years of continually updated satellite records for monitoring the current climate and assessing long-term changes in rainfall.

Since the early 1980s, the TAMSAT Group (University of Reading) have been providing locally calibrated, operational rainfall estimates based on Meteosat thermal infra-red imagery for Africa. These rainfall estimates are used in a wide range of applications and sectors, as well as in research. While the essence of the TAMSAT estimation algorithm has changed little in four decades, the TAMSAT Group are continually striving to improve the skill and usability of the rainfall products we create.

In this talk, we will present an overview of the TAMSAT rainfall estimation approach followed by a robust method for combining contemporaneous rain gauge information with the satellite estimates for improving estimation of rainfall amount. A novel feature of this work includes the estimation of spatially coherent rainfall uncertainty – a quantity which is often neglected in operational products but which can greatly support decision making amongst users, especially during adverse weather events. Such developments in TAMSAT have been developed in collaboration with several African organisations to support climate services in some of the world's regions most vulnerable to climate variability and change. We will also highlight recent capacity building efforts targeted at key users to help facilitate the uptake of TAMSAT products and which have been supported by the World Meteorological Organisation and leading African organisations responsible for issuing agrometeorological advisories.