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Verification of LandSAF Down-welling Surface Short-wave radiation Flux (DSSF) over a Savanna area in Burkina Faso, Africa

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Evaporation is a key variable in the water balance of all African regions. Many researchers have tried to identify evaporation on spatial distributed basis using remotely sensed indicators. Some algorithms proved to be successful during cloud-free situations. The problem that we are facing during cloud overcast periods however, is the temporal variation of cloudiness and the related radiation at the surface. This strongly influences the available energy for evaporation and thus also the actual evaporation, since during rainy seasons, evaporation is often energy constrained. Most satellites have a maximum of one overpass over a specific location per day, which complicates the interpretation of the daily radiation budget based on the information from these satellites.

LandSAF (see http://landsaf.meteo.pt/) is putting efforts in the derivation of land surface parameters from the Meteosat Second Generation (MSG) satellite. This satellite is geo-stationary and is centered precisely above Africa. It offers imagery every 15 minutes, thus providing opportunities to make spatially distributed energy budget estimates by an almost continuous assessment of the influences of cloudiness and dust on the radiation at the surface. One of LandSAF's main pre-operational products is the Down-welling Surface Short-wave radiation Flux (DSSF), which is computed on a half-hourly basis. This paper describes verification of this product with ground-truth measurements in Dano, a savanna area in Burkina Faso. The product proves to be a promising piece of the puzzle in the derivation of spatially distributed actual evaporation numbers during cloud overcast situations.