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Convective precipitation patterns analysis in the Sahelian area: satellite rainfall estimates and regional numerical modelling.

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Sahelian convection, mostly organized in Mesoscale Convective Systems (MCS), is examinated through the full-resolution Meteosat Second Generation (MSG-1) satellite images; indeed, the high temporal resolution (every 15 minutes) of the SEVIRI radiometer onboard the geostationary satellite allows to track the cloud system along their overall life cycle. Coherent precipitation patterns are presented for June to August, 2005 rainy season, with emphasis on a qualitative inspection of intraseasonal variability of the West Africa Monsoon (WAM). The longitudinal distribution of rainfall and the zonal component of motion, are investigated by means of suitable Hovmöller diagrams. The periodicity and phase of precipitation have been examinated through coherent patterns related to average satellite-based rainfall estimates within the diurnal cycle. Such observational studies, revealing essential in understanding the organization of convective activity, represent therefore a powerful tool for a full understanding of physical characterisation of WAM. Furthermore, in order to provide a dynamical description of monsoon mechanisms for both rainy seasons a Regional Reanalysis strategy has been developed based on Regional Atmospheric Modelling System (RAMS) forced by NCEP/NCAR Reanalysis. The RAMS better physical description, with respect to the NCEP/NCAR dataset, along with its higher spatial resolution (50km), provide a coherent and reliable atmospheric dataset especially for what concerns surface - atmosphere interaction governing monsoon dynamics.