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CALIPSO observations on the dynamics of dust plumes over West Africa during summer.

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North and West Africa is the world's largest source of mineral dust [e.g. Prospero et al., 2002]. Dust emissions over this region are highest during summer (e.g. Engelstaedter and Washington 2007) and are very variable in time and space. A recent study by Schepanski et al., [2009], has demonstrated that the dust activity over West Africa during the monsoon season, when the annual peak of dust emissions is observed, remains underestimated by regional models. Hence, accurate studies of dust emissions and transport over West Africa during the summer monsoon season are particularly important for better understanding the role of dust aerosol in the climate system.

In this study, dust emissions and transport are investigated using the space borne Could-Aerosol LIdar Orthogonal Polarization (CALIOP) on board the Cloud-Aerosol and Infrared Pathfinder Satellite Observations (CALIPSO) satellite, the Meteosat Second Generation (MSG) Spinning Enhanced Visible and Infra-Red Imager (SEVIRI) images produced from a combination of three infrared channels, namely channel 10 (12μm), channel 9 (10.8 μm) and channel 7 (8.7μm) and are analysed by mean of numerical simulations using the non hydrostatic mesoscale model MesoNH.

Satellites observations allowed the following of the spatio-temporal evolution of dust plumes over the continent and the determination of their vertical structure in connection with meteorological conditions specific to the summer wet-season.