



## **Deep convection in the Sahel : a focus on gust fronts**

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Convection in the Sahel presents a diurnal variability that is influenced by deep convection systems like the Mesoscale Convective Systems (MCSs) and isolated storms or smaller convective systems. These smaller systems have drawn less attention than the MCSs, even though they also play a role in the water cycle of this region, contribute to the monsoon dynamics, and to set the scales of the surface heterogeneities.

During the African Monsoon Multidisciplinary Analysis (AMMA) intensive observation period in 2006, many of these smaller systems have been observed with the Massachusetts Institute of Technology (MIT) radar that was installed in Niamey, Niger. A systematic study of daytime convection observed during the month of July 2006 is carried out based on the MIT radar data and on the complementary observations given by the ARM mobile facility, in order to analyse the processes and mechanisms involved of deep convection initiation. The results highlight a large frequency of occurrence of the density currents, and their importance in the initiation of new convective cells.

Based on this observational analysis and on results from Large Eddy Simulation (LES), density currents are specifically studied, with the aim at : (1) evaluating their frequency of occurrence, (2) assessing their ability to trigger new convective cells, (3) analysing the sensitivity of density currents velocity to land surface contrasts, (4) testing a simple model for their parametrization, (5) evaluating the ability of the LES to represent density currents.