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On-field measurements of size resolved dust emission flux in Niger during AMMA

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For assessing at regional scale the impact of mineral dust produced by wind erosion on radiative transfer, one must be able to predict the spatial and temporal distribution of 1) dust concentration and 2) those of its characteristics that rule particle interactions with solar and terrestrial radiation. Practically, these concentration and characteristics fields are sought by coupling a transport/deposition scheme with an emission model able to simulate the intensity and initial characteristics of emission fluxes at the source. Because of its major influence on the aerosol optical properties as well as on its ability to be transported away from the source, the initial size distribution of dust particles is particularly crucial.

A Dust Production Model (DPM) allowing computation of emission flux intensity and size distribution has been developed from wind-erosion simulations performed in a wind-tunnel. To this day, it has been only partially validated in the sense that only its vertical flux intensity predictions have been compared with outdoor measurements made in natural conditions. Until quite recently, the initial size distribution predicted by the model had never been validated for lack of appropriate field measurements. Such measurements have been performed for the first time in summer 2006 during the AMMA summer special observation periods that were performed in Banizoumbou (Niger). Erosion events observed during the field campaign can be sorted into two different categories: emissions due to the occurrence of convective systems (squall lines) and emissions due to monsoon southwesterly winds.

After presenting the original experimental system implemented to measure the size-distribution of the emission flux, this work analyses and compares the results obtained

in the two different generation conditions. A preliminary comparison of the measured size distribution with those predicted by the DPM is also presented.