

RESULTS



(a) Scattering coefficient observed on-board the ATR-42 (45) entiting the entities of diameter higher than 0.5 μ m is plotted in grey as a function of latitude. The black rectangle denotes the zone where the dust content is maximum. (b) The Angström coefficient calculated from scattering coefficients is represented by the blue line. The light blue area corresponds to the error bar including uncertainty in the measurements of scattering coefficients and propagation of errors during calculation



Simulations : (µg.m

Latitude (°) Difference of dust mass concentration between the simulation without sedimentation (NOSED) an simulation including sedimentation (SED). Negative (NOSED) and the concentrations correspond to sedimented particles. The black



exchanges between the ML and the SAL via entrainment **→** Presence of dust particles.

observations VS simulation results :

Different fraction of forest/shrub cover → Different localisation of high dust content.

CONCLUSION

This study describes the impact of vegetation anomalies on mineral dust particle sedimentation and entrainment observed during the AMMA experiment by using a combination of airborne observations and simulation exercises. Airborne measurements of aerosol characteristics were carried out along the meridian from Niamey (Niger) to Cotonou (Benin) and performed by two aircraft (ATR-42 and F-F20) on 13 and 14 June 2006. Observations were then interpreted using a mesoscale model simulation in order to explain the presence of high dust content over an area where local production is largely restricted by the surface cover.

Consistent with model simulations, we infer that the relationship between dust particle concentration and BI temperature occurs due to the deepening of the BL over warmer surfaces, by entrainment. The sedimentation process leads to the vertical transport of dust particles (1000 ug.m⁻³) from the Harmattan layer (or SAL) to the monsoon layer This mechanism may involve deep vertical transport (up to 800m) of dust particles in the monsoon layer. Thus, the comparison results confirm how the sedimentation and entrainment processes are linked with the mesoscale vegetation anomalies observed in the region.

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