



On Possible Effects of African Aerosol on the Atlantic ITCZ

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This presentation serves two purposes. The first is to point out the current gaps between the research on aerosol and on the short-term (seasonal to decadal) climate variability in the tropical Atlantic. Research on aerosol has mainly focused on either their radiative impacts on climate change or their effects on microphysics of clouds. Research on the short-term climate variability of tropical Atlantic has mainly focused on air-sea coupling and remote influences from ENSO and NAO. The lack of interaction between the research communities of aerosol and climate variability of the tropical Atlantic is stunning when one realizes that Africa is the largest source of aerosol, including biomass burning aerosol and mineral dust, and in the tropical Atlantic, immediately downstream of Africa, the aerosol concentration undergoes seasonal, interannual and decadal variability. Possible roles of African aerosol on the short-term climate variability of the tropical Atlantic through their effects on clouds in the ITCZ have hardly ever been studied. Such roles are possible because of the connections between the ITCZ and SST, SST and African rainfall, and African rainfall and African aerosol that have been demonstrated by observations and modeling. The missing link is between African aerosol and the ITCZ. The second purpose of this presentation is to show some recent satellite observations that indicate such a link might indeed exist. If so, African aerosol should be an integral component of the climate system of the tropical Atlantic, instead of its external stochastic forcing as currently viewed.