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Influence of Saharan Air Layer on convective development: the Lagrangian approach

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The Saharan Air Layer (SAL) is an intensely dry, warm, and mineral-dust-laden mass of desert air which often propagates westward, overlaying cooler, more humid air of the tropical Atlantic Ocean. The SAL has been shown to be detrimental to tropical cyclone formation and, as such, been cited among potential causes of the weaker-than-anticipated 2006 Atlantic hurricane season. In this study, we seek to better understand the evolution of Atlantic deep convection as influenced by the SAL during the 2006 hurricane season. Specifically, we are creating a Lagrangian data base of convective systems by tracking cloud patterns in high temporal resolution, Spinning Enhanced Visible and Infra-Red Imager (SEVIRI) observations using cross-correlations. These Lagrangian cloud trajectories are composited with aerosol data from the Ozone Monitoring Instrument (OMI), microwave sea surface temperatures from Remote Sensing Systems, radiative flux measurements by the Geostationary Earth Radiation Budget (GERB) sensor, and upper-tropospheric humidity estimates from SEVIRI water vapor channels. This study details the methodology behind our automated cloud tracking algorithm, and presents a preliminary statistical summary of the life cycle of deep convection as a function of aerosol amount and sea surface temperature.