Role of Saharan air layer in tropical storm – A NU-WRF simulation of a HS3 event

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The role of Saharan Air Layer (SAL), characterized by an extremely hot, dry and dust-laden layer of the atmosphere, in tropical storm formation and intensification remains an open scientific question. The Hurricane and Severe Storm Sentinel (HS3) mission is designed to address the question through the substantial measurements over three hurricane seasons using two Global Hawks unmanned aircrafts that are equipped with a set of instruments geared toward environmental measurements and understandings of storm inner-core structure and processes. The National Aeronautics and Space Administration (NASA) Unified WRF (NU-WRF) is an observational driven regional modeling system that represents chemistry, aerosol, cloud, precipitation and land processes at satellite-resolved spatial scales. The Goddard Chemistry Aerosol Radiation and Transport (GOCART) module has fully been coupled with the Goddard microphysics and radiation schemes in NU-WRF that allows investigations of the direct and indirect aerosol effects in the climate/weather system. The NU-WRF has been employed to simulate a SAL event during the HS3 campaign period (August 24 and 25, 2013) to probe the role of dust aerosols in tropical storm development. This presentation will compare the simulation results to the HS3 measurements, and discuss the linkage between Saharan dust and tropical storm over the Atlantic Ocean.