



## **Impacts of the Saharan Air Layer on Tropical Cyclone Genesis**

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Recent observations of tropical cyclone genesis in the Atlantic during NAMMA, have indicated that interaction of convection associated with the Saharan Air Layer (SAL) leads to explosive growth of convection causing genesis of a tropical storm. This is in contrast with previous observations of Dunion and modeling studies of Tripoli and Dunion (2007) that the SAL actually inhibits storm development. The SAL, characterized by warm mid level temperatures, low relative humidity and high concentrations of Saharan dust is known to have several impacts. The previous studies of Mediterranean storms by Tripoli et al (2005) have demonstrated that the SAL can act to suppress convection while destabilizing the atmosphere, creating a loaded gun type thermodynamic profile that leads to intense convection when triggered. Presumably, the storm circulation may act as such a trigger. Hashino and Tripoli have also shown that the increased ice nuclei of the SAL can impact the microphysical process, altering rain rates of Mediterranean storms. More recently Tripoli and Dunion (2007) show that the shear associated with the SAL can strongly suppress the genesis process.

Hence, three separate effects of the SAL have been identified that can affect the tropical cyclone genesis process: (1) Impact of the dust on the microphysical process, (2) thermodynamic impact of the mixed layer and (3) dynamic impact of the increased wind shear caused by the SAL. In this talk, a controlled numerical investigation of how tropical cyclogenesis is affected by these three processes will be presented to address these questions.