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Satellite observations of intense dust loading over Indian region during SIDR cyclone

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Tropical cyclones are one of the most prominent weather systems characterized by higher atmospheric pressure gradients and wind speeds. Fierce tropical cyclones occur in India during the pre-monsoon (spring), early monsoon (early summer), or post-monsoon (fall) periods. Originating in both the Bay of Bengal (BoB) and the Arabian Sea (AS), tropical cyclones often attain velocities of more than 100 kmh-1 and are notorious for causing intense rain and tidal waves as they cross the Indian coast. In this study, we examine the changes in aerosol properties associated with an intense tropical cyclone, the so-called “SIDR”, that occurred during 11th - 16th November 2007 over the Bay of Bengal. This cyclone, accompanied with very strong surface winds reaching ~223 kmh-1, caused extensive damage over Bangladesh. Ground-based measurements of Aerosol Optical Depth (AOD) in the neighboring urban environment of Hyderabad, India, showed significant variations due to changes in wind velocity and direction associated with the cyclone passage. Terra-MODIS and AVHRR satellite images showed prevalence of dust particles mixed with anthropogenic emissions over AS, while over the BoB the aerosol load is significantly lower. . Aerosol index obtained from Ozone Monitoring Instrument (OMI) suggested presence of an elevated dust-aerosol layer during and after the cyclone. Meteorological parameters from MM5 Mesoscale model Model were used to study the variations in winds associated with the cyclonic activity.