



## **Analysis of the Impact of Major Dust Events on the Aerosols Characteristics over Saudi Arabia**

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The Kingdom of Saudi Arabia is a major source of atmospheric dust. Frequent dust storms blow up and significantly affect human activities, airports and citizens' health. Aerosols optical and physical characteristics are influenced by major dust storms outbreaks. In this, paper, ground based AERONET measurements are integrated with space-borne sensors, namely MODIS and CALIPSO to analyze aerosols' characteristics during March – May of 2009 where a massive dust storm blew up and caused a widespread heavy atmospheric dust load over Saudi Arabia and the same period during 2010, where less dust activities were reported. The MODIS Deep Blue AOD analysis showed similar aerosols pattern over the land, however a substantial variance in aerosol loading during March – May 2009 compared with the same period in 2010 was observed. The angstrom exponent analysis showed that the majority of aerosol measurements in 2009 and 2010 are dominated by coarse-mode particles with angstrom exponent  $< 0.5$ . Detailed analysis of aerosol optical properties shows significant influence of coarse mode particles in the enhanced aerosol loading in 2009. The volume depolarization ratios (VDR) derived from CALIPSO backscattering measurements is used to find latitudinal profile of mean aerosol optical depth to indicate the type of particles and to discriminate spherical aerosols with non-spherical particles.

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