



Severe dust storms over the Arabian Peninsula: Observations and modeling

ahmed shalaby

International Centre for Theoretical Physics, Earth System Physics, Trieste, Italy (ashalaby@ictp.it)

Dust aerosols and dust storms have tremendous effects on human health and all development activities. Also atmospheric dust plays a major role in the Earth climate system by its interaction with radiation and clouds. Severe dust storms are considered the severest phenomena in the Arabian Peninsula, since they are occurring all the year round with maximum activity and frequency in Summer. The Regional Climate Model (RegCM4) has been used to simulate severe dust storms events in the Arabian Peninsula from 1998 up to 2011. This long period simulation shows a typical pattern and dynamical features of the large-scale severe dust storm in winter seasons and summer seasons. The Aerosol Optical Depth (AOD) from the model outputs have been compared against ground-base observations of three AERONET stations (i.e. Kuwait, Mazeria and Solar-Village) and daily space-based observations of MISR, Deepblue and OMI. The dynamical analysis of the large-scale severe dust storms reveal the difference between winter time storms and summer time storm. Winter time storm occurs when the cold air front in the north is coupled with the extension of the Red Sea trough from the south. However, the summer time storm is associated with strong Shamal wind that extend from northern Kuwait to the southern Arabian Peninsula.