DUST AND CLIMAT OVER KUWAIT

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We investigate the consistency between Aerosol Optical Depth (AOD) retrieved by MODerate resolution Imaging Spectroradiometer (MODIS) sensor aboard NASA's Aqua satellite and measurements collected by ground-based AErosol RObotic NETwork (AERONET) site in Kuwait for 2007-2012. Figure 1 shows a good correlation (r = 0.7) between the two datasets. The concentration of particles with geometric mean radius ranges of 0.05–15 μm has been studied as well. Seasonal variations are clearly found in the shape and magnitude of the volume size distributions (VSDs) for PM2.5 and coarse particles. The highest concentrations of aerosol coarse particles are found during the spring. Both PM2.5 and coarse particles concentrations increase substantially during dust storms,

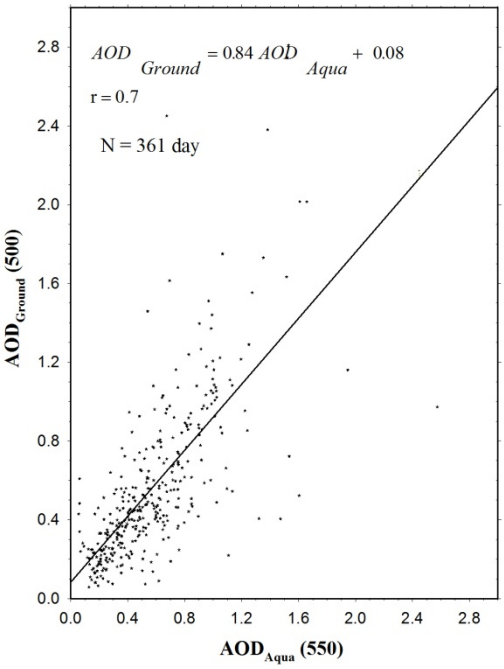

Figure 1. linear regression between satellite and AERONET datasets.

reaching the highest values during the dust storm of 24 May 2012. The method of superposed

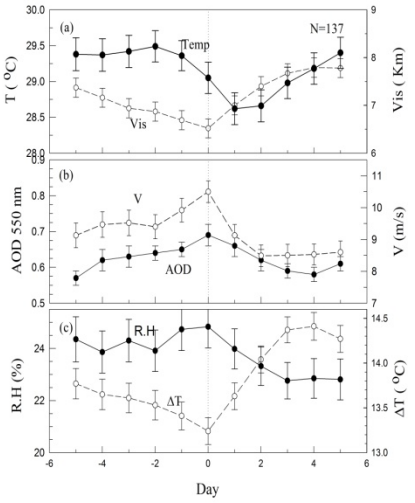

Figure 2. Superposed meteorological parameters centered on the 137 dusty days.

epoch analysis (Sabbah, 2010) is used to test the behavior of meteorological parameters during the dusty days of 2012. Figure 2 shows significant increase in wind speed (v), reductions in visibility (Vis) and diurnal temperature range (DTR) during dusty days. We also see a decrease in air temperature (Temp) one day after dust occurrence. This effect can be due to scattering of sunlight back to space by the suspended dust particles.

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