

The Interactions between Aerosols and Fogs Based upon Long-Term Satellite Products from MODIS and VIIRS

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The impact of natural and anthropogenic sources of air pollution has gained increasing attention from scientific communities in recent years. In particular, over East and South Asia during winter months, the formation of fogs often coincides with extreme haze events. These tropospheric aerosols not only perturb radiative energy balance by interacting with solar and terrestrial radiation, but also by changing fog properties and lifetime. With the launch of Terra/MODIS in 1999, Aqua/MODIS in 2002, and SNPP/VIIRS in 2011, high quality comprehensive aerosol climatology is becoming feasible for the first time. As a result of these unprecedented data records, studies of the radiative effects on fogs due to tropospheric aerosols are now possible. In this study, we will investigate the interactions between aerosols and fogs over East and South Asia. We will examine the diurnal evolutions of the physical and optical properties of fogs and aerosols by comparing the observations derived from the morning satellite (i.e. Terra) with those from the afternoon satellites (i.e. Aqua and SNPP). Finally, by combining these analyses with the MERRA-2 products the effect of atmospheric dynamics and water vapor in modulating the variability of aerosol and fog properties in Asia will be discussed.