

# **Study of MODIS-derived cloud top temperature/ pressure and aerosol optical thickness**

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Aerosols influence the earth's radiation balance and climate directly, by scattering shortwave (solar) radiation in cloud-free conditions and indirectly, by increasing concentrations of cloud droplets thereby, enhancing cloud shortwave reflectivity. In this paper level-2 data of Moderate Resolution Imaging Spectroradiometer (MODIS) on-board Aqua and Terra satellites have been used to study Cloud Top Temperature (CTT), Cloud Top Pressure (CTP) and Aerosol Optical Thickness (AOT) over Pakistan. These data were obtained for winter (Dec-Feb), pre-monsoon (Mar-May), monsoon (June-Aug) and post-monsoon (Sep-Nov) seasons over the area covering 22-36°N, 60-80°E for the period 2000-2004. The study shows that maximum values of CTT and CTP are respectively in the range of 293-299° K and 800-875hpa in monsoon over the areas covering (25-36)° N/60-75°E implying that maximum amount of infrared radiation were emitted by the clouds in this season during the study period. Similarly minimum values of these parameters were observed in the range of 243-253° K and 400-450hpa in the winter season over the areas covering (25- 36)° N/75-80°E and 31°N/65-70°E. The maximum value of AOT is in the range 0.9-1.0 at 22°N, 25N/60-75°E during monsoon season while at 22°N/60-68° E it is in the range of 0-0.4 during post-monsoon season. The study concludes that the amount of radiation emitted by clouds and aerosols as measured by satellite was maximum in monsoon and minimum in the post-monsoon season over the study area.