

Title :

**Aerosol Optical Thickness and Total Ozone Column
Diurnal Variation and Characterization
Using a Microtops II Sunphotometer in Manila, Philippines**

Authors :

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Abstract

Ground-based measurements of Aerosol Optical Thickness (AOT) at 1020 nm and Total Ozone Column (TOC) were done in Manila, Philippines (14.567° N, 120.980° E) using a Microtops II sunphotometer for the period of February to April 2014 at 30-minute intervals (0900-1200H, 1300-1600H, LT). The diurnal variation of the mean AOT was 0.238 with $AOT_{\min}=0.118$ and $AOT_{\max}=0.461$ with $SD=0.0907$. TOC mean was 222.546 DU while $TOC_{\min}=204.794$ DU and $TOC_{\max}=266.976$ DU with $SD=9.539$. There is a large day-to-day variation for AOT and TOC due to some surface meteorological factors and atmospheric conditions. Analysis of variance for TOC and AOT resulted in p-values of 4.27×10^{-10} and 1.14×10^{-5} , respectively, which indicate a significant difference between both timeslots. Also, a significant difference was found between the monthly datasets for TOC ($p=1.66 \times 10^{-29}$) and AOT ($p=3.68 \times 10^{-7}$). The study also investigated the effects of solar zenith angle (SZA), relative humidity (RH) and surface temperature (ST) on AOT and TOC. ST showed weak positive correlations with AOT ($r=0.28$) and TOC ($r=0.29$). RH was only moderately correlated with AOT ($r=0.422$) and had a weak positive correlation with TOC ($r=0.234$). On the other hand, SZA showed a strong positive correlation and influence on TOC behavior ($r=0.626$), but had a weak negative correlation for AOT ($r=-0.102$).

Keywords:

Aerosol Optical Thickness, Total Ozone Column, Microtops II, Sunphotometer, Urban Monitoring, Surface Temperature, Relative Humidity, Solar Zenith Angle

Suggested topics :

Remote Sensing Applications – Urban Monitoring

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