

## ABSTRACT

### EFFECTS OF SURFACE METEOROLOGICAL PARAMETERS ON AEROSOL OPTICAL PROPERTIES FROM SUNPHOTOMETER MEASUREMENTS OVER MANILA

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Aerosol optical properties such as aerosol optical depth (AOD) at 500nm together with wavelength exponent ( $\alpha$ ) and Ångström turbidity coefficient ( $\beta$ ) obtained from SP02 Middleton Sunphotometer over Manila were used to analyze their response to the changes in temperature, relative humidity (RH) and zonal wind. Data retrieved for a one year period of measurements (August 2009- July 2010) were used to describe the variations of the aerosol optical properties. Hourly daytime variation of AOD,  $\alpha$  and  $\beta$  were described in terms of percent departure from the mean. The maximum positive digression from the mean were observed at 11am, 2pm and 11am for AOD,  $\alpha$  and  $\beta$ , respectively. The maximum AOD was measured in June 10, 2010 while the minimum occurred in April 14, 2010. The highest monthly variation was recorded in June 2010. Significant seasonal variations in aerosol optical properties were observed. The temperature, relative humidity and wind speed played their important roles to modulate the aerosol behavior in the region. Temperature showed weak correlations with the aerosol optical properties. Relative humidity both obtained from surface and lower troposphere confirmed evidence for its influence on aerosols size distribution and dominant aerosol type. Zonal wind demonstrated influences on the prevailing aerosol present at a certain area and caused alteration the amount of its loading. A weak positive correlation has manifested between Total Suspended Particulates (TSP) and AOD. This means that a high TSP does not necessarily mean a high AOD and vice versa. AOD obtained from MODIS and the SP02 sunphotometer showed a similar trend. However, values from the latter were much higher compared with the former.