

**EFFECT OF THAR DESERT ON ATMOSPHERIC AEROSOLS STUDY IN UV RANGES OVER NORTH- CENTRAL INDIA USING TOMS AEROSOLS DATA**

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**1. Introduction**

Atmospheric aerosol emissions originating from the Northern Indian Subcontinent region have significant effect on local and regional climate and earth radiation energy budget. The Thar Desert in western India provides a one of the local natural source of dust for the North Indian Subcontinent (Sagnik 2004). The dust and sulfates base aerosols reflect more solar radiation and cool or warm the earth atmosphere. However, the scientific understanding of the aerosols climatology i.e. radiative forcing magnitude are very few over densely populated, highly industrial and urbanization region and different meteorological conditions over North-Central India i.e covering the Geo. Lat.  $24.5^{\circ}\text{N}$  to  $28.5^{\circ}\text{N}$  and Geo. Long.  $40^{\circ}\text{E}$  to  $95^{\circ}\text{E}$ . This region covers the various type of geographical areas such as Shara Desert, Marine Region, Thar Desert, Indo-Gangetic Basin and provide to study the effect of dust storm, urbanization, industrialization, seasonal and geographical dependence of atmospheric aerosols.

**2. Data Analysis**

In the present study, an attempt will be made to study the atmospheric aerosols over North-Central Indian Region specifically, effect of Thar Desert using the TOMS Aerosols Data in UV range for to January, 1980 to December, 1981. The monthly, seasonal and spatial variation of atmospheric aerosols in UV range over North Central India region are shown in Fig.1 (a, b, c, d). The monthly mean values with standard error bars of the mean values are also shown in the figures.

**3. Results**

- (i) Fig.1 (a, b, c, d) show the variation of the mean value of Aerosols Optical Depth (AOT) in UV ranges for each month with longitudes for three latitude i.e.  $24.5^{\circ}$ ,  $26.5^{\circ}$  and  $28.5^{\circ}\text{N}$ . The over all trend of variation of AOT for the same geographical region are almost the same during year 1980 and 1981. However, the higher values of AOT are found in April and May (Pre- Monsoon Period) and the lower values are observed in winter months ( December and January). The magnitudes of AOT also shows the dependence with

- longitudes. It ranges are from low value of .2 to high value of 2.0. The error bars exhibit variation in value of AOT of the order  $\pm 0.1$ .
- (ii) The higher value of AOT are found over Gulf Desert i.e Long.  $45^\circ$  to  $50^\circ\text{E}$  and sharply decreasing trend is observed in marine region i.e.  $50^\circ$  to  $55^\circ\text{E}$  (Figs. 1 (a, b, c, d)). After that the values of AOT are showing the increasing trend with longitude up to  $90^\circ\text{E}$  to  $80^\circ\text{E}$ . This range of longitude decreases with the increasing the latitude range. This increasing trend with longitudes are more evident in Pre-Monsoon Period (Fig. 1(b)). The peak values of AOT are observed in the value of 2.0 to 1.8 over the IG basin during the Dust Storm Period.
- But the reverse trend is observed in June to October months. The more details of results would also be discussed.

#### 4. References

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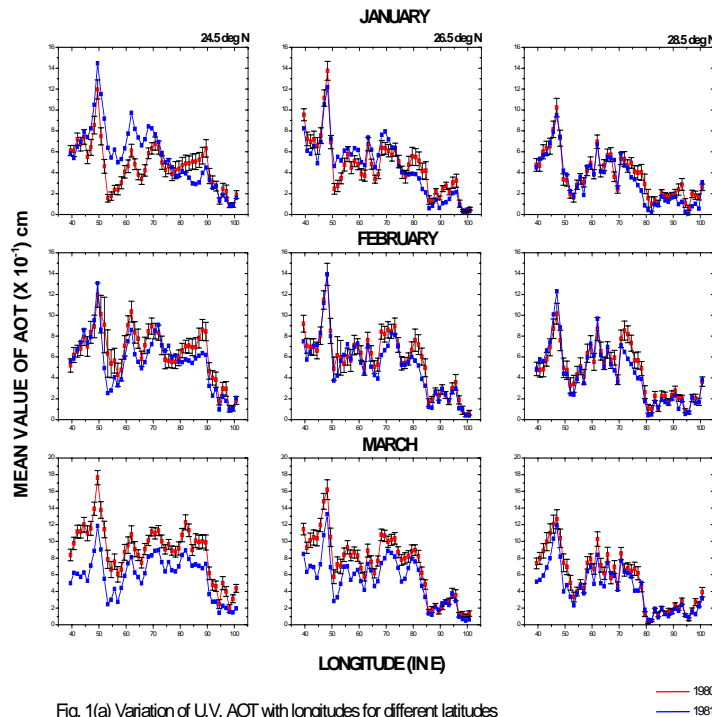


Fig. 1(a) Variation of U.V. AOT with longitudes for different latitudes

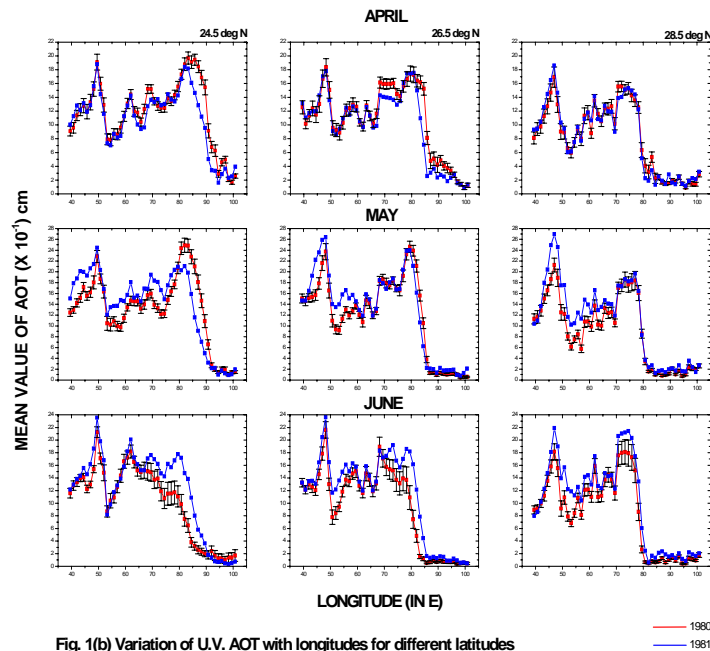


Fig. 1(b) Variation of U.V. AOT with longitudes for different latitudes

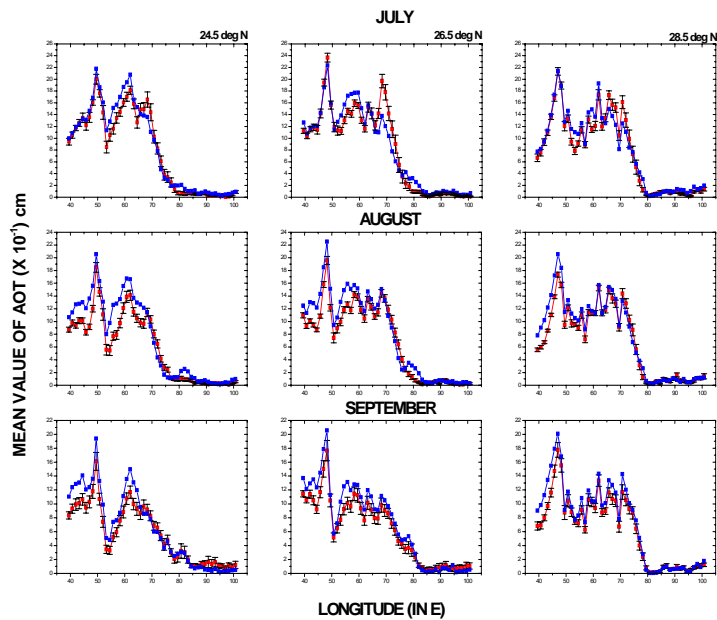


Fig. 1(c) Variation of U.V. AOT with longitudes for different latitudes

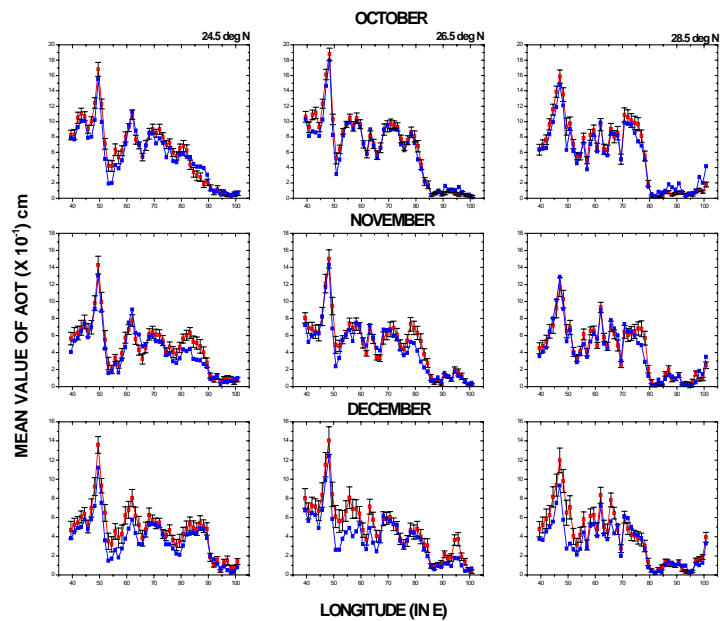


Fig. 1(d) Variation of U.V. AOT with longitudes for different latitudes

— 1980  
— 1981