Long term trends in Total Ozone Column over Indian region

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The functional attribute of the Total Ozone Column (TOC) to modify the incoming solar radiation by filtering the high energy ultra violet (UV) portion of the spectrum is crucial for life on Earth. In present study, time-series decomposition analysis was performed on girded Multi Sensor Reanalysis (MSR) Total Ozone Column (TOC) monthly mean time-series data-set [1979-2008] for Indian region covering latitude spread 0° N - 40° N, and longitude spread 67.5^o E to 97.5^o E (1o Latitude x 1.5o Longitude grid size; total 861 grid points). Long-term trends were estimated after removing annual cyclic (seasonal) variations. Errors associated with the long-term trend estimation were calculated taking into account the auto correlation present in the deseasonalized monthly mean MSR TOC time-series for each grid point. Statistically significant declining trends ranging from (−) 0.8 - (−) 1.5 percent/decade were seen over Indian region above 25o N latitude in MSR TOC data-set (1979-2008). Observed TOC decline covered 40% of total geographical area of Indian region, however rest of the Indian region (peninsular) did not show any statistically significant trend.