# Particulate Extinction in the Tropical UTLS Region Over the Indian Sector

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Annual variation of particulate extinction ($\alpha_a$) in the UTLS region at different latitudes over the Indian longitude sector (70-90ºE) for 30ºS-30ºN is examined in detail using the SAGE II data during the volcanically quiescent period of 1998-2003. For the latitudinal sectors between 10°S-15°N, though the value of $\alpha_a$ is relatively high in the UT region irrespective of season, a pronounced summer-winter contrast is observed over Northern hemisphere. North of 15°N, the winter peak becomes relatively weak and almost insignificant beyond 25°N. South of 20°S, the $\alpha_p$ in the UT region is relatively small and does not show any pronounced annual variation. The observed temporal variation of $\alpha_p$ in the UT region could mainly be caused by the migration of ITCZ (associated with the movement of deep convective region) over a confined latitudinal region 20°S-20°N. The annual variation of Convective indices in different latitudes over this region is well correlated with the corresponding variation of $\alpha_p$ in the UT region. In general, the value of integrated $\alpha_a$ ($\tau_p$) in the UT region decreases with increase in latitude from equator. The particulate loading in the lower stratosphere also is quite high near the equator and decreases with increase in latitude. This feature confirms the existence of a stratospheric aerosol reservoir which is mostly confined to tropics. While the particulate extinction in the 18-21 km region shows relatively low values in the equatorial region up to ±15°, it shows an increase in the off equatorial regions. The latitude variation of $\tau_p$ at a higher altitude (21-30 km) shows an opposite behavior with high values near the equator and low values towards north. While the values of $\tau_p$ at lower altitudes (18-21 km) near the equator could be attributed to rapid transport of particulates from near equatorial region to higher latitudes, the high values of $\tau_p$ in the upper regime (21-30 km) could be attributed to lofting and accumulation. While the particulate extinction in the UT region over the NH and SH are seasonally complementary, they are more-or-less annually symmetric in the lower stratosphere region except for the fact that the winter peak is less pronounced over the SH especially in the off equatorial region.

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