

CONTRIBUTION OF BLACK CARBON EMISSIONS ON CLIMATE CHANGE**M.L. Karumudi, B. Kvs***National Remote Sensing Agency, Department of Space, Government of India, Balanagar, Hyderabad, India*

There is growing evidence that the earth's climate is changing and will likely continue to change in the future. In this paper, we present results from our measurements on black carbon aerosols, total aerosol mass concentration and aerosol optical depth over an urban environment namely Hyderabad during 2003. Diurnal variations of BC suggests that high BC concentrations observed during 6:00-9:00hrs and 19:00-23:00hrs. Weekday variations of BC suggest that the day average BC concentrations increases gradually from Monday to Wednesday and gradually decreased from Thursday to Sunday. Analysis of traffic density along with meteorological parameters suggests that the primary determinant for BC concentration levels and patterns is traffic density. Seasonal variations of BC suggest that the BC concentrations are high during dry season compared to rainy season due to scavenging effects of BC during rainy season. Fraction of BC to total mass concentration has been observed to be 7% during January to May. BC showed positive correlation with total mass concentration and aerosol optical depth at 500nm. Radiative transfer calculations suggests that aerosol radiative forcing at the surface is as high as -42 Wm^{-2} and at TOA is $+10 \text{ Wm}^{-2}$. The difference between the TOA and the surface forcing over observed to be $+32 \text{ Wm}^{-2}$ which suggests the absorption capacity of atmosphere over the study area. The results have been discussed in detail in the paper.