

Simultaneous Study of Atmospheric Black Carbon Aerosols over Udaipur, A Semi Urban Area and Jaisalmer, A Thar Desert Area using AETHALOMETER

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Extensive measurements on atmospheric black carbon (BC) have been made in recent years so far over several parts of Indian Subcontinent using well known instrument like Aethalometer specifically over southern, northern, eastern and middle part of Indian sites. However, there are very few reports available in literature quantifying the BC measurement and its radiative forcing over western region part of India which is located near Thar Dessert region. The Thar desert, some time also described as 'The Great Indian Desert', lying in the North western part of India with an area of about the 10^6 km^2 , is also known to be important sources of single largest contributor about 30% of natural aerosols over different parts of the globe. The long range transport of these mineral dust aerosols produced by weathering of soil and originated from the arid and semi arid region of Indian Thar region, Pakisatan, Iran, Iraq, Saudi Arabia, Oman, Yemen etc., are also made significant contribution even at locations far away from their sources and over remote oceans by the combined action of convection currents and general circulation system. The dust aerosols also exhibit high variability in their different types of concentrations materials and resulted example as radiative impact due to of dominance of Fe, Hematite which is strongly absorbing type of incident solar radiation. Further more, high variability also arises mainly due to the variation of the soil characteristics from region to region as well as due to accumulation of black carbon aerosols on dust while airborne.

To study the dust aerosols and BC and their impact on the earth's climate via earth energy radiation budget and atmospheric instability, the continuous and near- real instrument for the measurements of Black Carbon Mass Density was started at Jaisalmer (Geo Lat. 26.9°N, 70°E, Alt. 212 meter) a Thar Desert region since March, 2009 and also at Udaipur (Geo Lat. 24.6°N, 73.6°E, Alt. 590 meter), slightly about 350 km toward south east to Thar Desert region. In this regard, the two similar Aethalometer (Model AE-31) have been installed at both site after completing the calibration process of both Aethalometer at Udaipur under ARFI research project of ISRO- GBP. The regular and round the clock continuous observations of BC mass density at seven channels have been carried out in each five minutes interval from March, 2009. From the analysis of BC data over two stations, the diurnal, monthly and

day and night time variations of BC over the Jaisalmer and Udaipur would be presented in this paper. More details of the above results in the light of comparison of these BC results with several meteorological parameters and air mass trajectories over both stations would also be discussed in the present paper.