

Winter-Time Aerosol and Pre-Cursor Gas Characteristics over Bay of Bengal during ICARB

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An Integrated Campaign for Aerosols, gases and Radiation Budget (ICARB) in winter 2008-2009 had been undertaken under the aegis of ISRO's ongoing climate change research program, from December 27, 2008 to January 30, 2009 over the Bay of Bengal (BoB) region. This special cruise was meticulously planned also to characterize aerosols and gases along the boundaries of BoB, particularly the eastern most coastline of BoB, where not many measurements of this sort were made earlier. In this communication, we report columnar aerosol optical depth (AOD) at different narrow spectral bands centering at 340, 440, 500, 675, 870 and 1020 nm, and pre-cursor gases (water vapor and ozone) retrieved from high-time resolution (five-minute interval throughout) Sun-photometer and Ozonometer data. Observations carried out on about 20 days under clear-sky conditions have been considered in this study. Pending presentation of more details, salient results of the study are summarized below:

- (i) The mean AOD_{500 nm} values over whole and middle BoB are found to be 0.31 ± 0.15 and 0.25 ± 0.11 respectively, while in coastal regions, AOD is found to be significantly higher as compared to middle BoB, with an exception to the north-eastern corridor of BOB (Myanmar), where AODs are found to be lower as compared to those near coastal regions of Bengal and Bangladesh. Interestingly, AOD exhibited the highest values in the latitude belt between 15.8° and 20.6°N during the entire cruise period. Such high latitudinal gradients of AOD seem to result from changes in large-scale circulation pattern, leading to spatial convergence and vertical confinement of aerosols.
- (ii) The diurnal variations in AODs are found to vary from a low of 3.8%, 5% to a high of 23%, 29% at 500 nm and 1020 nm, respectively.
- (iii) The Angstrom exponent ($\alpha_{340-1020}$) shows a minimum value of 0.74 in the middle of BoB and maximum value of about 1.4 near the coast.
- (iv) The diurnal variability in columnar water vapor (CWV) and total column ozone (TCO) is found to vary from a minimum of 2.7%, 0.7% to a maximum of 9.5%, 7%, respectively. TCO shows higher values close to Thailand and Andaman territory than rest of the places over BoB.