

**CHARACTERIZATION OF AEROSOLS AND GASES OVER MAITRI DURING 24<sup>TH</sup> INDIAN ANTARCTICA EXPEDITION**

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## Introduction

Aerosols and pre-cursor gas observations over the Antarctic region play a great role not only in the Earth's radiation budget but provide reference levels for all environmental and pollution studies due to its remoteness and restricted human activities. Thus, in this region, while the total mass of the aerosol particles suspended in the vertical atmospheric column of unit cross section yields smaller values, the lower aerosol optical depth at all the visible and near-infrared wavelengths is of great concern for Earth's radiation budget studies. The attenuation of solar irradiance and the processes of scattering and absorption by the aerosol particles may cause appreciable effects on the radiative exchange mechanisms occurring in the Antarctic atmosphere. Hence the aerosol properties and their effects on other weather and climate of this region are certainly different from other continental areas. Moreover, the study of heterogeneous chemistry of aerosols - a unique phenomenon of polar regions, provides information on gas-to-particle conversion processes leading to formation of secondary aerosol particles and their influence on ozone content.

The present paper essentially deals with measurement of optical, physical and radiative properties of aerosols and pre-cursor gases, and estimation of direct aerosol radiative forcing and document heterogeneous chemical effects of aerosols in the Antarctic region. In order to investigate these aspects, extensive field experiments have been undertaken at Maitri, the Indian Antarctic station, during the 24<sup>th</sup> Indian Antarctic expedition to characterize aerosols by means of multi-spectral solar radiometers that can measure concurrent total column aerosol optical depth, size distribution, ozone and water vapor, and also down-welling radiative flux using a pyranometer, simultaneously. Such studies are very sparse and almost non-exist over the Maitri station, and hence the proposed measurements would help bridging this gap to certain extent. The experimental and data details along with other interesting results obtained will be presented. Comparison of the results with those obtained over southern Indian Ocean during transit journey between Cape Town and Antarctica will also be discussed.