

Aerosol and Cloud Microphysical Properties During Normal and Weak Monsoon Conditions as Observed in CAIPEEX

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Observational study of clouds, aerosols and their interaction is very essential for understanding the various mechanisms which lead to precipitation and also for conducting the precipitation enhancement experiment. Clouds can have many uncertain aspects like their formation, persistence, and ultimate dissipation where the role played by aerosols is very significant. Recently, many efforts are being undertaken to improve the current state of knowledge of aerosol-cloud interactions, and their impact on precipitation/monsoon activity. One such major observational campaign being conducted in India is CAIPEEX (Cloud Aerosol Interaction and Precipitation Enhancement Experiment), by the Indian Institute of Tropical Meteorology (IITM) and funded by the Ministry of Earth Sciences (MoES), Govt. of India. In-situ observations of aerosol, cloud microphysical properties and all the meteorological parameters were carried out over different parts of India using an instrumented aircraft during the Phase-I of CAIPEEX from May to September 2009.

The aircraft data collected from Hyderabad and Bareilly as bases were utilized in this study to bring out the observed differences in the aerosol and cloud microphysical properties during weak and normal monsoon conditions. Though the SW monsoon covered the above two regions by 9th June, and 30th June 2009 respectively, the initial period rainfall activity were observed to be weak. The transition from weak to active monsoon conditions was experienced in a week's time over Hyderabad. Preliminary analysis showed the broadening of the cloud droplet spectra over these regions apart from changes observed in aerosol parameters. Over Bareilly region, first observations were made during the third week of July 2009 when the monsoon activity was weak. Again the observations were repeated during the third week of August 2009 when the monsoon activity was normal. Here also changes were observed in the cloud microphysical parameters during the above periods. More results along with the reasoning will be discussed.

Keywords : Monsoon, aerosols, cloud microphysics