



Cloud Drop Size Distribution in Different Regions over India during CAIPEEX-2009

Savita B. Morwal, Maheshkumar R. S., and Kulkarni J. R.

Indain Institute of Tropical Meteorology, Dr. Homi Bhabha Road, N.C.L. Post Office, Pashan, Pune 411 008. INDIA
(morwal@tropmet.res.in)

Tropical clouds have high albedos and they decrease the amount of solar energy absorbed by the earth system, reducing heating rates. During cloud formation the number concentration of the cloud droplets depends on the number of aerosols present in the air mass. Therefore, aerosols determine the cloud properties such as number concentration of cloud droplets and their size. Recent studies have shown that size distributions of cloud droplets change with the vertical development of the cloud. The fair weather continental cumulus clouds with no precipitation have relatively narrow drop size spectrum while the continental cumulus clouds which have reached more matured stage of cumulus congetus show much broader cloud drop spectrum (Hobbs et al., 1980). The maritime clouds have even broader drop size spectrum as compared to continental clouds (Battan and Reitan, 1957). Warner (1969a; 1969b) has studied in detail the drop size distributions over the Australian coast. Such studies on cloud droplet size distributions, effective radius and their effect on cloud microphysics and dynamics are sparse or non existent in the tropical monsoon clouds occurring over the Indian sub-continent.

Recently a national level observational experiment called 'Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX)' has been conducted over the Indian region during May-September 2009. In this experiment an instrumented aircraft was used to collect in-situ observations of aerosols and cloud microphysical parameters viz. liquid water content, total water content, concentrations of aerosols, Cloud Condensation Nuclei (CCN) and cloud droplets of different sizes, temperature, humidity etc over different parts of Indian sub-continent. Utilizing the data collected through this experiment an attempt has been made to examine the characteristics of cloud droplets distributions in different regions over. The results of the investigation will be discussed.

Battan, L.J. and Raitan, C.H. 1957 Artificial Stimulation of Rain, pargaman.

Hobbs, P.V., Politovich, M. K. and Radke, L. F. 1980: The structures of summer convective clouds in eastern Montana. I: Natural clouds. *J. Appl. Meteor.*, 19, 645–663.

Warner, J. 1969a The microstructure of cumulus cloud: Part I. General features of the droplet spectrum. *J. Atmos. Sci.*, 26, 1049-1059.