Inferences from *in situ* and Satellite Aerosol and Cloud Observations during a Dry to Wet Transition

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An intensive observation period of Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX) was conducted over Pune during 17-20 May, 2009. This period was characterized by an enhancement in the aerosol loading, as evidenced by Aeronet aerosol optical depth (AOD) observations (Figure 1). The MODIS level II observations over Pune (73.86 ^{o}E, 18.5 ^{o}N) region showed considerable spatial heterogeneity in the aerosol optical depth in the valley. The increase in cloudiness and thunderstorm events during the later part of the study period showed a reduced aerosol optical depth at selected locations. The CAIPEEX observations on May 17, 19 and 20th showed the existence of an aerosol rich boundary layer and an elevated aerosol layer. The CAIPEEX observations also indicate that aerosol effective radius enhanced in the presence of clouds during the later part of the study period. Vertical profiles from Calipso and Cloudsat observations are used for further verifications

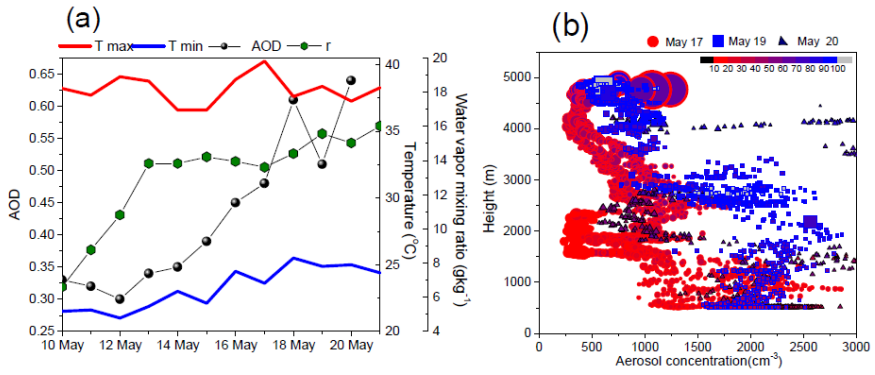

Figure 1. AOD from Aeronet observations over Pune and daily maximum and minimum temperature and water vapor mixing ratio (r) over Pune (a). Vertical profile of aerosol concentration and effective radius (size of symbols) and relative

humidity (colormap) from three CAIPEEX flights over Pune screened for cloud (b)

Various cloud parameters from MODIS terra and aqua passes at 1 km and 5 km resolutions are considered for comparison with CAIPEEX observations. Flow trajectories are used to interpret the disparities between various observations, which are also influenced significantly from the dynamical interactions.

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