Behaviour of Monsoon Precipitating Cloud Systems Over Semi-arid-regions of India

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Kadapa (14.47°N; 78.82°E) is located in semi-arid zone and experiences often experiences drought and also it receives scant rainfall and its annual average rainfall is much below the National average. The ground water level is at 600-900 feet below the earth's surface in many areas of Rayalaseema, more especially, in Kadapa and Anantapur districts. The ground water level never reaches to expected levels even in monsoon seasons due scanty rainfall and poor seepage conditions. Under these conditions, only drought prone plant species alone survive resulting in the decrease of forest cover. In summer, the maximum temperature reaches ~46^0. These semi-arid conditions resulted in desertification. Many predict that total desertification is not very far. Hence, Yogi Vemana University (YVU) is establishing a semiarid zonal Atmospheric Research Centre (SARC) at YVU campus with the active support of Indian Space Research Organization (ISRO) to understand the monsoon, planetary boundary layer and also atmosphere processes/dynamics, more especially the precipitation thorough round the clock observations using remote and in-situ sensors. The main objectives of the SARC is to set-up and operate ***SARC observational facility with a comprehensive set of remote sensing and in-situ equipment to characterize the state of the semi-arid atmosphere, its radiative properties and interaction with the land surface, for the study of physical/dynamical processes, climate monitoring studies, Weather Disaster Management and validation studies.***

The main objective of the present study is to understand the challenging issues/problems relating to monsoon variability, specially the issues related to the interaction between clouds, aerosols and radiation and the land-atmosphere interactions in the semi-arid zones, continuous monitoring of the atmospheric conditions by remote sensing instruments. For the present study 2-Automatic Weather Stations, India Meteorological Department Climate Station, Micro Rain Radar and Laser disdrometer is utilized to understand the microphysical characteristics of precipitating clouds systems observed during Southwest (SW) and Northeast (NE) Monsoon seasons. Comparison of Rain integral parameters obtained Disdrometer and MRR shows a fairly good agreement. SW monsoon rain intensity is high and short duration. Whereas NE monsoon rain intensity is moderate to low and long period. A cloud system [Convective, mixed (Convective/stratiform), Stratiform] Algorithm utilize to understand monsoon precipitating clouds. Micro Rain Radar observed vertical profiles of Rain Integral Parameters show the existence of maximum occurrence of Convective clouds during SW

monsoon whereas mixed and stratiform clouds observed during NE monson precipitating event. The details of the analysis procedure, causative mechanisms and other important findings over Kadapa were reported during the symposium.