



Unravelling the features of thunderstorm rainfall for 8 contrasting regions of India through Disdrometer network

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Indian Institute of Tropical Meteorology (IITM), Pune has built up the testbed for rainfall microphysics for understanding the detail features of rainfall characteristics as observed over 8 different regions of India which differ contrastingly with respect to their geographical and climatic variations. The regions include New Delhi, Mumbai, Kolkata, Chennai, Kochi, Pune, Mahabaleshwar and Bhopal– thereby covering the coastal, orographic and plain regions of Indian sub-continent where 8 Joss-Waldvogel Disdrometer are been in operation continuously. The raindrop size distribution (DSD) data for the month of March-May during 2021- 2023 have been used in this reported study. With the present system in operation, the study tried to highlight the variation of DSD as observed over these 8 stations specially during these pre-monsoon period when the regions experience the rainfall accompanying with severe thunderstorm. The initial analysis reveals that the majority of this rainfall occurs during the afternoon hours for almost all these stations with a contrasting diurnal variation with each other. The impact of strong surface heating and evaporation plays an important role for this contrasting diurnal pattern of rainfall distribution. Similarly, it has also been found that the raindrops of diameter 2.8 mm are dominant for the New Delhi rainfall with respect to all the other stations during these pre-monsoon periods. The morphology of the prevailing clouds is also considered to be one of the important factors for these heterogenous microphysical features of DSD. In line of that it has been observed that the maritime and continental clouds provide their strong impact on the variation of surface DSD where maritime cloud contains smaller concentration of larger droplets and continental clouds contains “tenfold”-larger concentrations of respectively smaller droplets. Although the pre-monsoon rainfall over Indian region is generally continental in nature, but the biasness of these rainfall towards the continental/maritime side has been revisited in more details with respect to Z-R relationship in this study. More details related to this study will be highlighted in the Conference.