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## Precipitation variability from drop scale to urban scale in the Dallas-Fort Worth metro region

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Precipitation variability from drop scale to regional scale is not fully understood, except we know there is variability at all scales. The Center for Collaborative Adaptive Sensing of the Atmosphere (CASA) Dallas-Fort Worth (DFW) urban demonstration network consists of a high-resolution, dual-polarized X-band radar network and a National Weather Service S-band radar system for areal coverage as well as a network of in-situ instruments including tipping bucket gauges, and disdrometers in the DFW international airport. Based on the CASA DFW monitoring platform, we have been exploring the rainfall variability across the airport scale of a large airport such as DFW. We study the variability of precipitation within the airport grounds and the corresponding impact on airport monitoring and regulatory compliance issues. We also extend this variability analysis across the DFW metro which is also considered a large metro region. The particle size distribution and its small-scale variability are analyzed on both heavy and light rainfall events. As for the catchment scale, the spatial heterogeneity of precipitation in the DFW international airport is specially explored. As for the regional scale, the DFW metropolis is used, and its precipitation variability and trends are demonstrated under the DFW urban radar network. Finally, hydrological response to precipitation variability during the rainstorm event in the DFW international airport is discussed. These observations provide an insight into the relation between space time variability of precipitation and practical response activities in an important region such as airport grounds.