Precipitation Observation Site in Central Texas for Ground-Validation of Satellite QPE

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High-fidelity satellite Quantitative Precipitation Estimation (QPE) relies on physical assumptions that require localized ground-level constraints. This specialized research field site, established at the University of Texas at San Antonio (San Antonio, Texas, USA) by the author, offers high-resolution surface precipitation measurements that can be used for satellite algorithm validation and the refinement of radar-based rainfall retrievals. The facility features a unique instrumental framework for characterizing microphysical and bulk precipitation quantities, complemented by a 10-m meteorological tower. The suite includes commercially established sensors — such as the OTT Parsivel² disdrometer, OTT Pluvio² weighing gauge, TB-4 tipping-bucket rain gauges, and 3D sonic anemometers — alongside unique research instruments developed by the author's laboratory: the High-speed Optical Disdrometer (HOD) for accurate raindrop size, shape, and fall speed observations and the Aerial Disdrometer for raindrop size distribution and fall speed measurements at different elevations. By providing necessary sub-pixel uncertainty quantification and microphysical constraints, the site has the potential to serve as a regional resource to refine surface rain rate retrievals from spaceborne observations. We will present the technical capabilities of this facility to invite collaborative endeavors aimed at advancing satellite QPE and other hydro-meteorological applications. This material is based upon work supported by the National Science Foundation under Grants No. AGS-1741250.