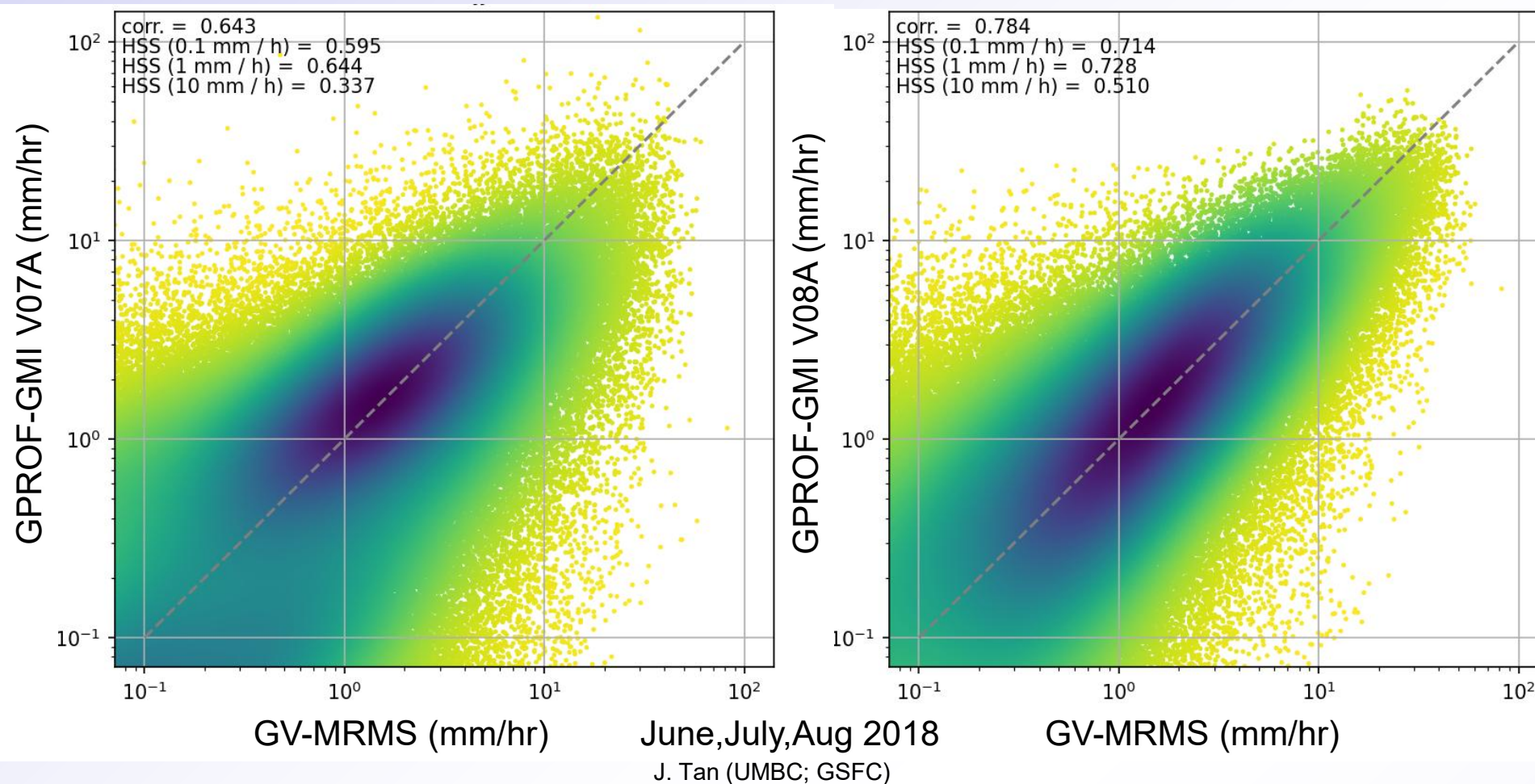


Moving the Precipitation Goal Posts: Shifting from Averages to the Distribution ... In the Right Place

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Good news

- users continue to access our precipitation data for an increasing number of scientific studies and practical applications
- the GPM Core Observatory is expected to fly until early 2034
- early machine learning efforts are paying off



- new sensor technologies are enabling smallsats
- research on QPE and uncertainty estimates is underway

Selected challenges and future directions, taking Reinsurance as an example

- reinsurance companies are using IMERG (currently) to write parametric insurance policies, both for underwriting and payout
- invest in algorithm development:
 - the insurance policies cover extreme events at specific places, so getting the average right isn't sufficient
 - improve the representation of precipitation extremes across the entire history (and into the future) of PMW sensors
 - time/space varying uncertainty estimates will enable underwriters to refine their estimates
 - tackle uncertainty quantification by expanding on recent research
- prioritize future satellite capabilities needed for precipitation estimation:
 - parametric underwriting requires a long, homogeneous data record to ensure a stable statistical sample
 - maintain a satellite with sufficient channel diversity and resolution to serve as the reference for the constellation
 - address the impact of varying-quality and often high-frequency PMW platforms on multi-satellite precipitation products and advance the technology for low-cost low-frequency instruments
- create a modern multi-source data processing system:
 - continued processing, using advanced algorithms, is required for continued support for the reinsurance industry
 - process multiple native-format datasets and co-developed value-added datasets; add running versions of the algorithms in parallel