Validation of the GOES-R ABI LAP retrieval algorithm using the GOES-13 sounder

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Topics: Severe Weather and Lightning

Program: AWG

2. Introduction

- Continue validation of GOES-R ABI legacy atmospheric profile (LAP) algorithm (Xie et al. 2012)

- Use GOES-13 sounder measurements as proxy (Lee et al. 2013)
  - Similar coverage as ABI over the CONUS
  - Similar geometry

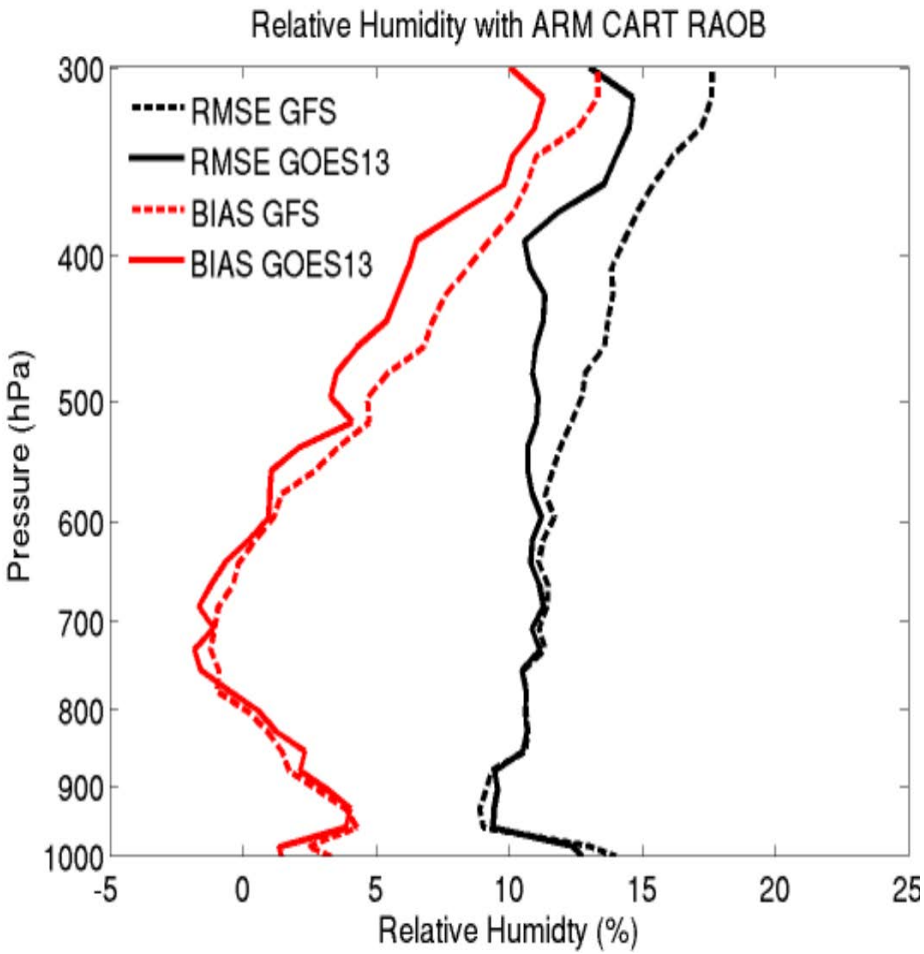
- Explore the use of the GOES-R ABI LAP algorithm for the current instruments

3. Methodology/Expected Outcomes

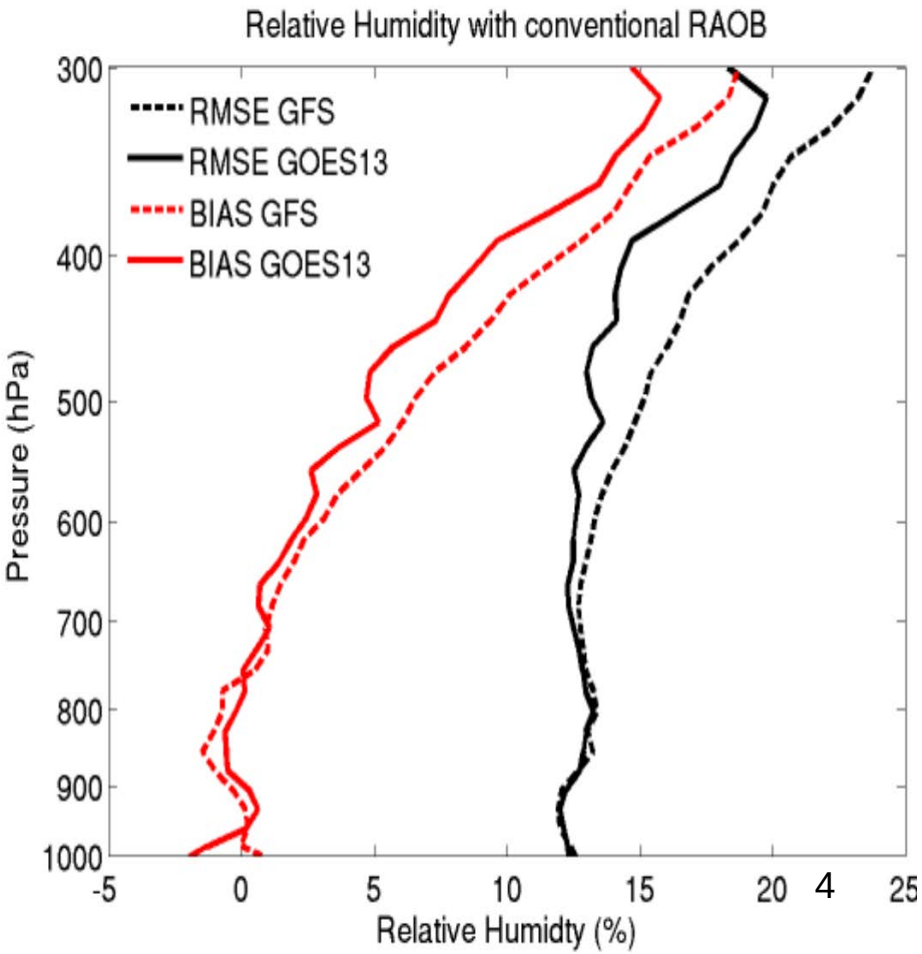
- Compare the GOES-13 LAP products from the GOES-R ABI LAP algorithm with
  - RAOB profiles
    - CART ARM site
    - Conventional
  - TPW measurements
    - ARM RAOB
    - Conventional RAOB
    - ARM microwave radiometer (MWR)
    - AMSR-E (ocean)
    - GPS

4.1 Results: validation of RH profiles using RAOB

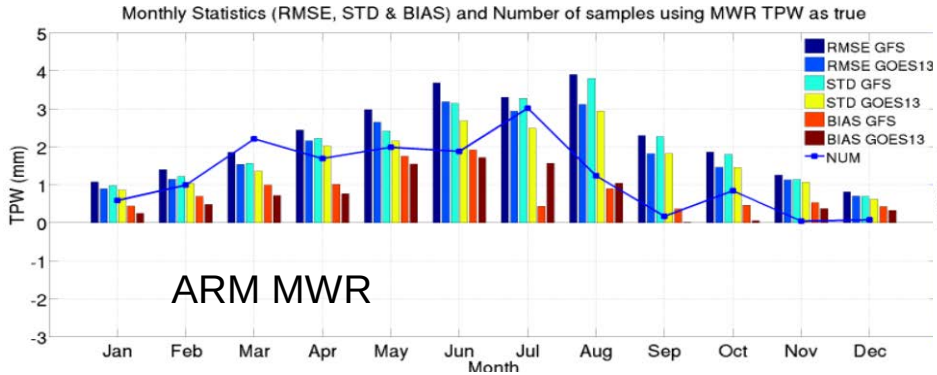
ARM

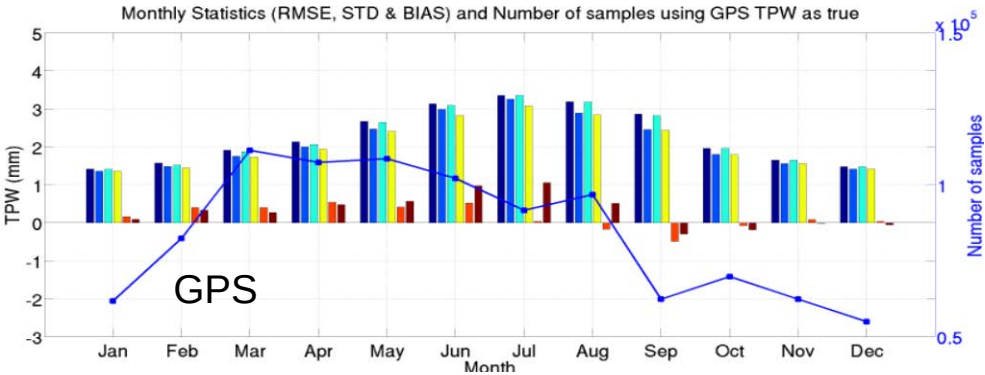


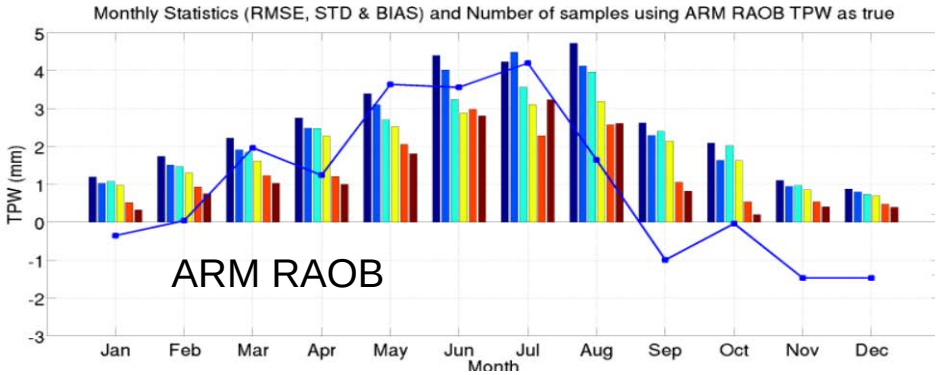
Conventional

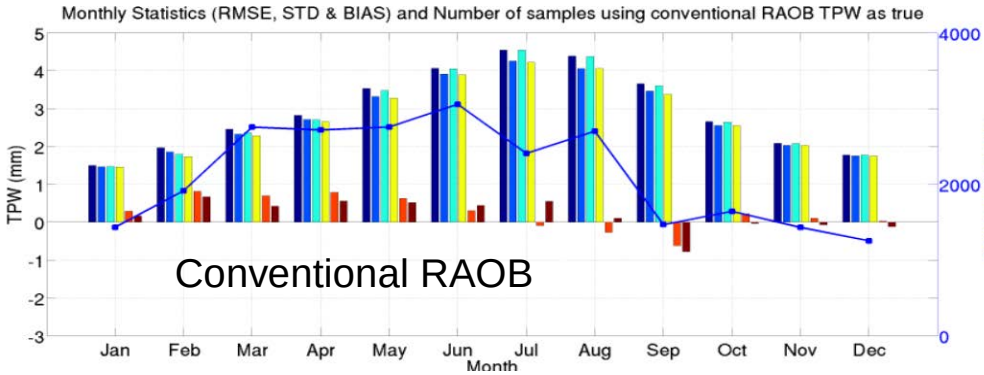


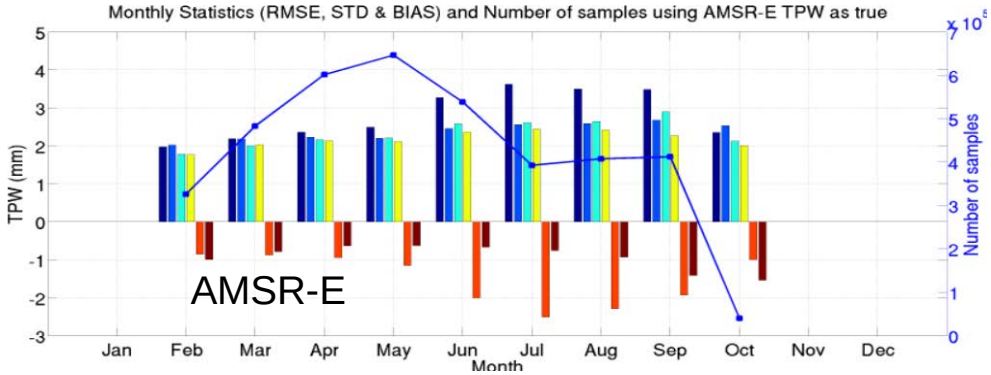
4.2 Results: validation of TPW ---- Monthly



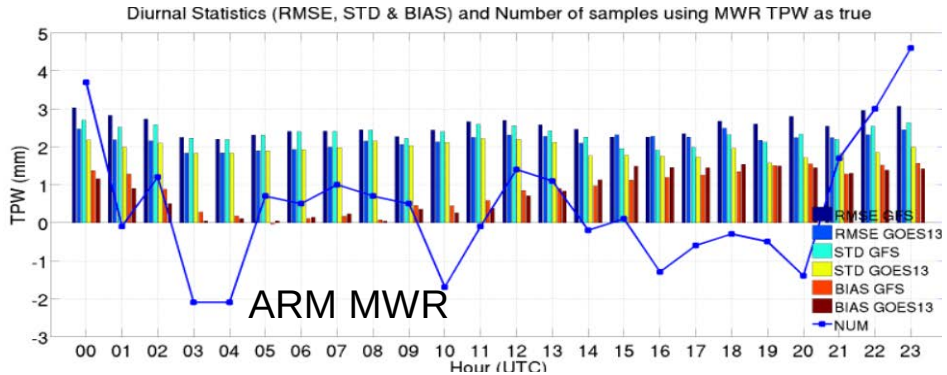


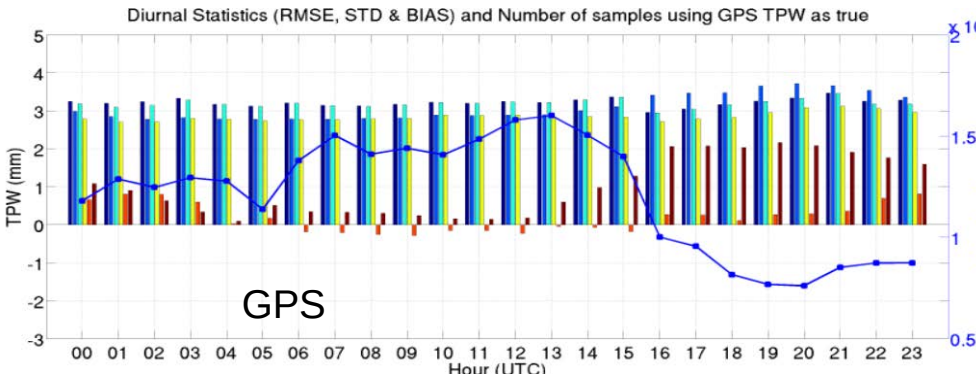


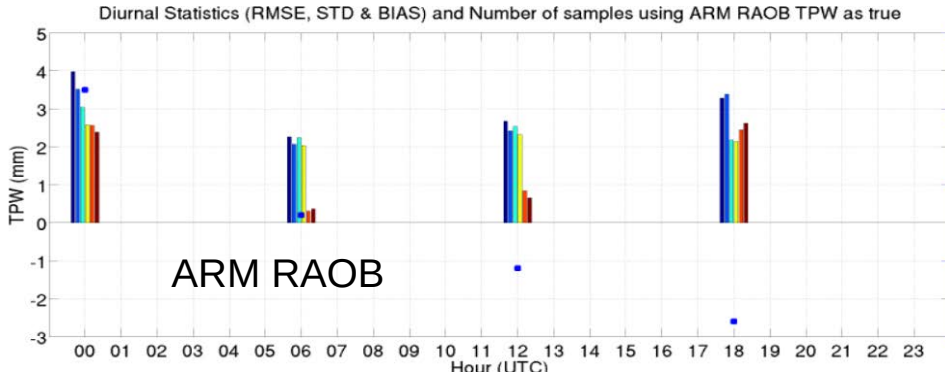


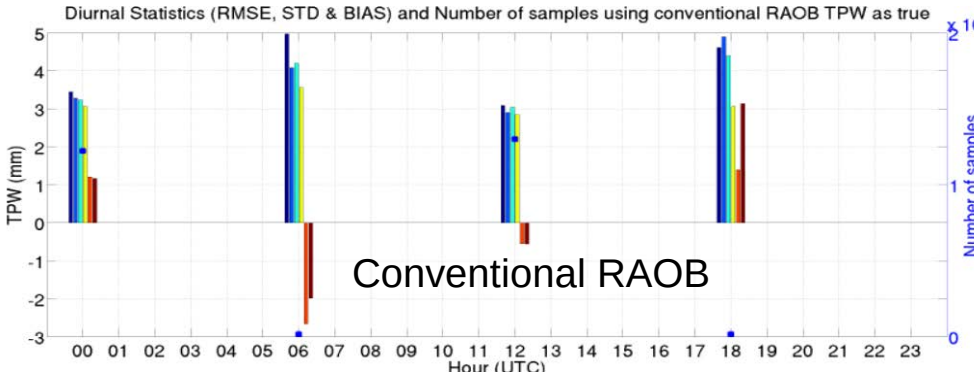


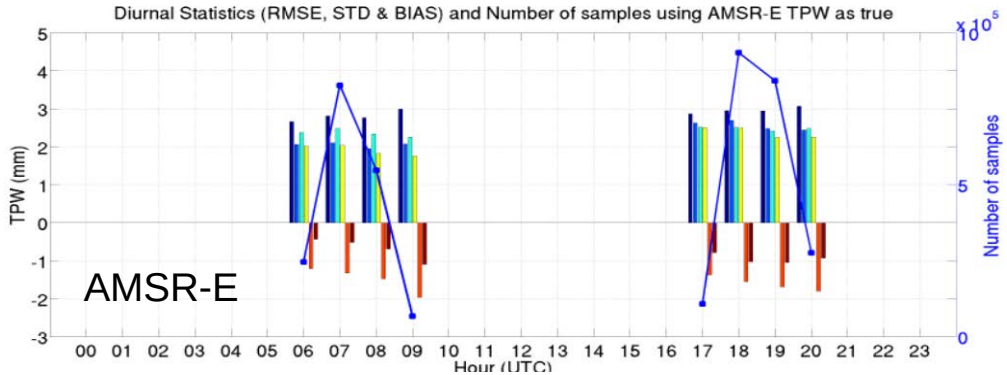
4.3 Results: validation of TPW ---- Diurnal



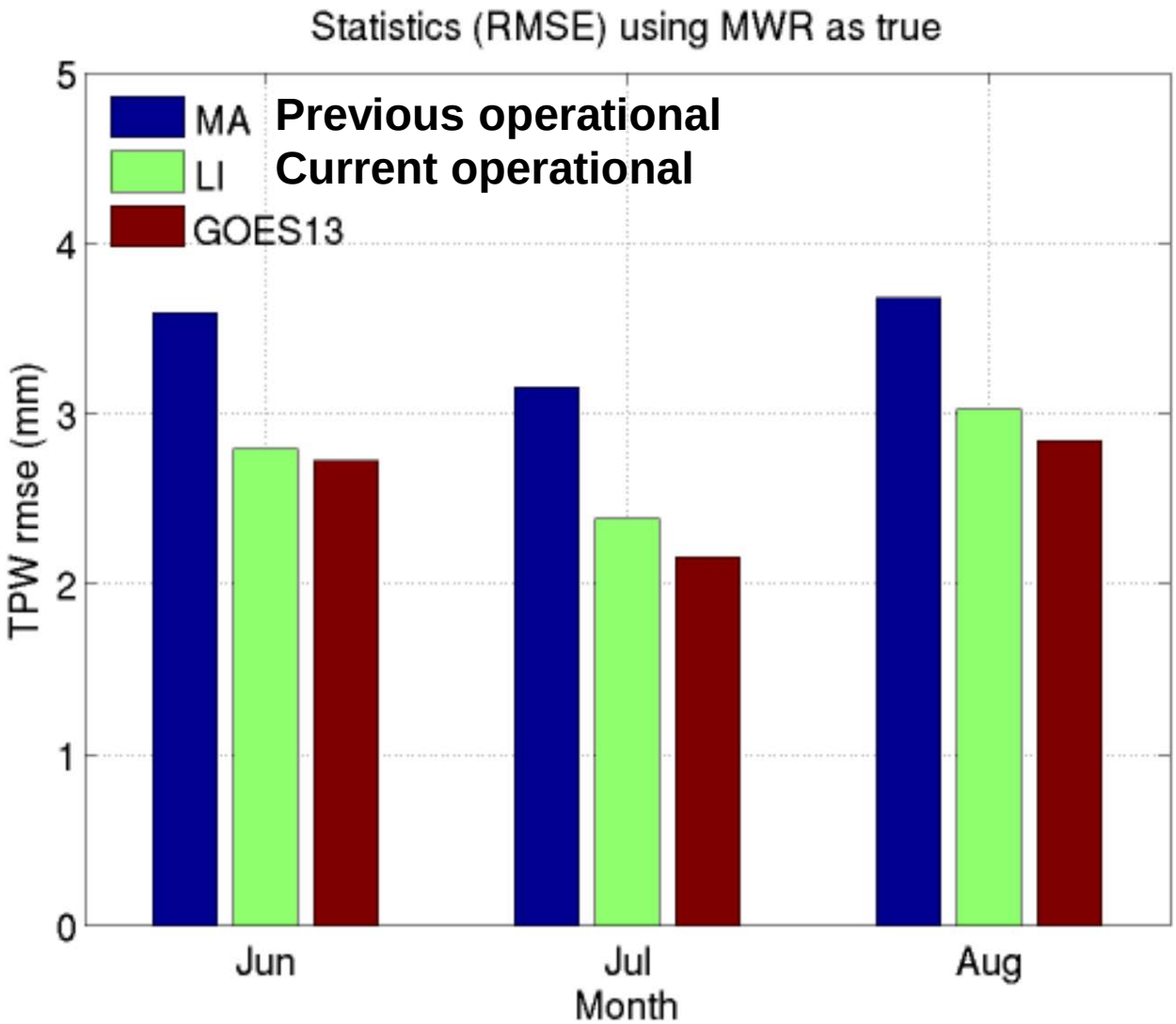








4.3 Results: comparison with the current operational GOES sounding products



5. Possible Path to Operations

- Besides GOES-R operation, the GOES-R ABI LAP algorithm could be potentially applied to the current instruments for improved operational sounding products
  - GOES sounder
  - MODIS
  - SEVIRI

6. Future Plans

- Improve GOES-R ABI moisture sounding using GPS TPW (Li 2009)
  - Half an hour
  - High precision
- Cloudy GOES-R ABI LAP sounding in (Li et al. 2009)
  - Thin clouds
  - Low clouds
  - Cloud edge

7. Publication List

- References
  - Li, Zhenglong, J. Li, W.P. Menzel, J.P. Nelson, III, T.J. Schmit, E. Weisz, and S. A. Ackerman (2009), Forecasting and Nowcasting improvement in cloudy regions with high temporal GOES Sounder infrared radiance measurements. J. Geophys. Res., 114, D09216, doi:10.1029/2008JD010596.
  - Li, Zhenglong (2009), Improvements and Applications of Atmospheric Soundings from Geostationary Platform. Ph.D thesis. University of Wisconsin- Madison, Madison, WI
- Project Publications
  - Lee, Yong-Keun, Z. Li, J. Li, and T. J. Schmit (2013), Evaluation of the GOES-R ABI LAP retrieval algorithm using the GOES-13 sounder, submitted to Journal of Atmospheric and Oceanic Technology.
  - Xie, Hua, N. R. Nalli, S. Sampson, W. W. Wolf, J. Li, T. J. Schmit, C. D. Barnet, E. Joseph, V. R. Morris, and F. Yang (2012), Integration and Ocean-Based Prelaunch Validation of GOES-R Advanced Baseline Imager Legacy Atmospheric Products, submitted to Journal of Atmospheric and Oceanic Technology.