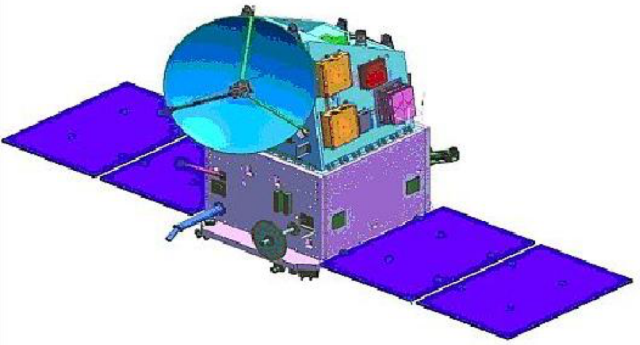
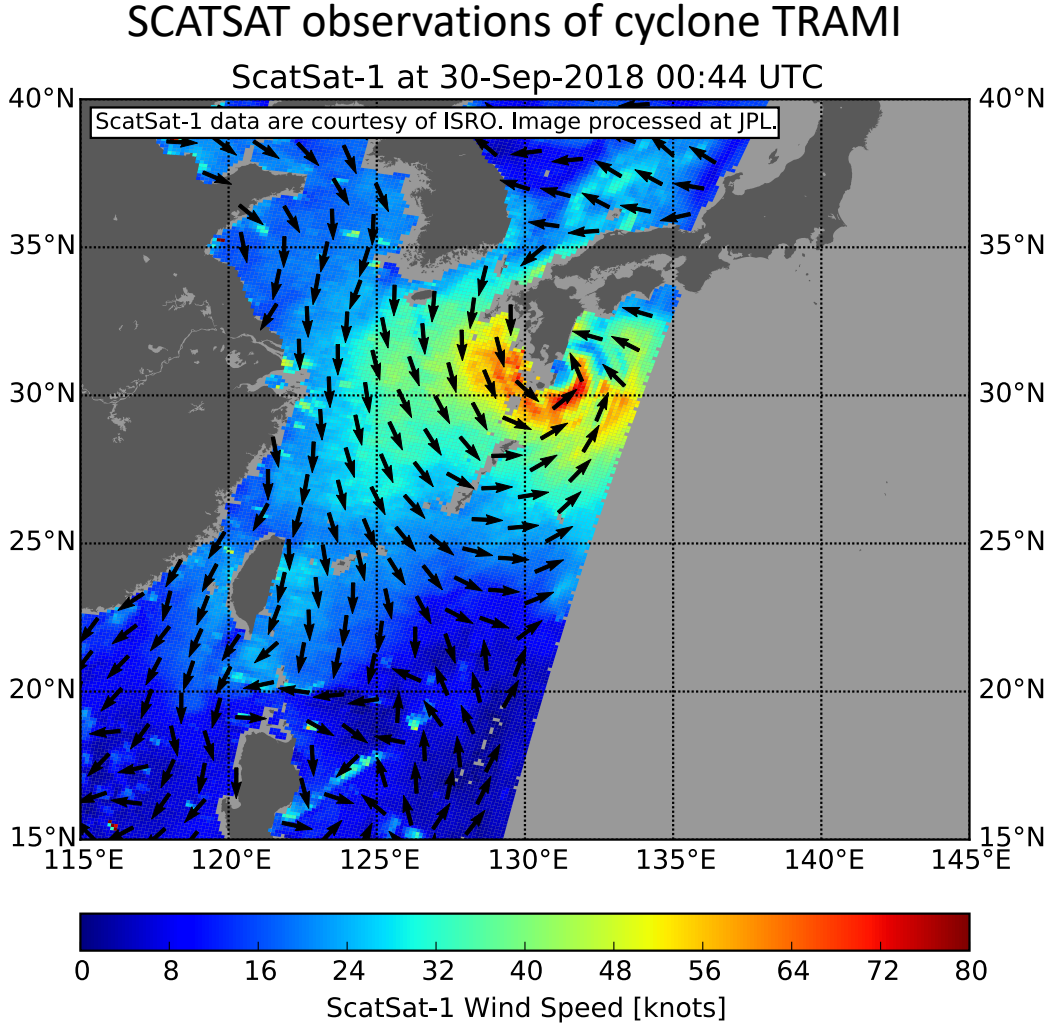


SCATSAT NRT data and Preliminary Calibration

Alexander Fore, Bryan Stiles, Sermsak Jaruwatanadilok, and Ernesto Rodriguez

Jet Propulsion Laboratory, California Institute of Technology



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Initial SCATSAT Calibration using QuikSCAT

- Using QuikSCAT we determined calibration estimates from both Ocean and Amazon (from 1.1.3 testdata)
  - We correct for LOTD between QuikSCAT and SCATSAT using data derived from RapidSCAT.
  - *They are not in agreement, neither were they for OSCAT, and to a lesser degree RapidScat.*

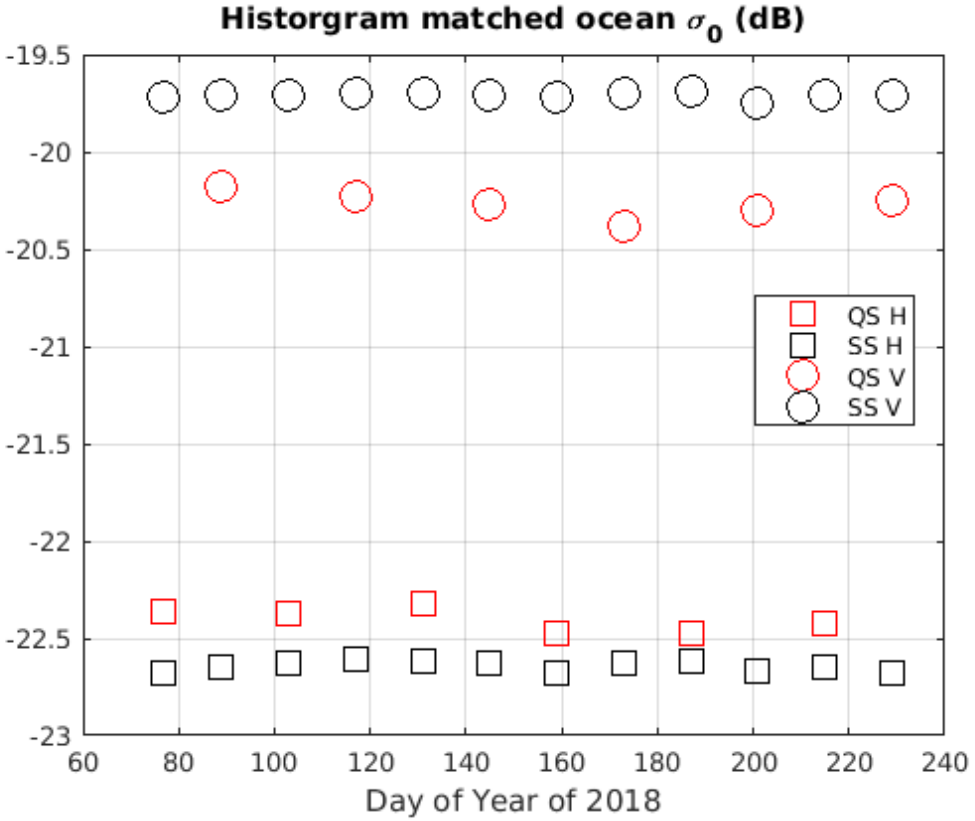
SCATSAT	Ocean via QS	Amazon via QS	Difference	Used in proc.
HH adjustment	+0.31 dB	-0.15 dB	+0.46 dB	+0.51 dB
VV adjustment	-0.56 dB	-0.82 dB	+0.26 dB	-0.26 dB

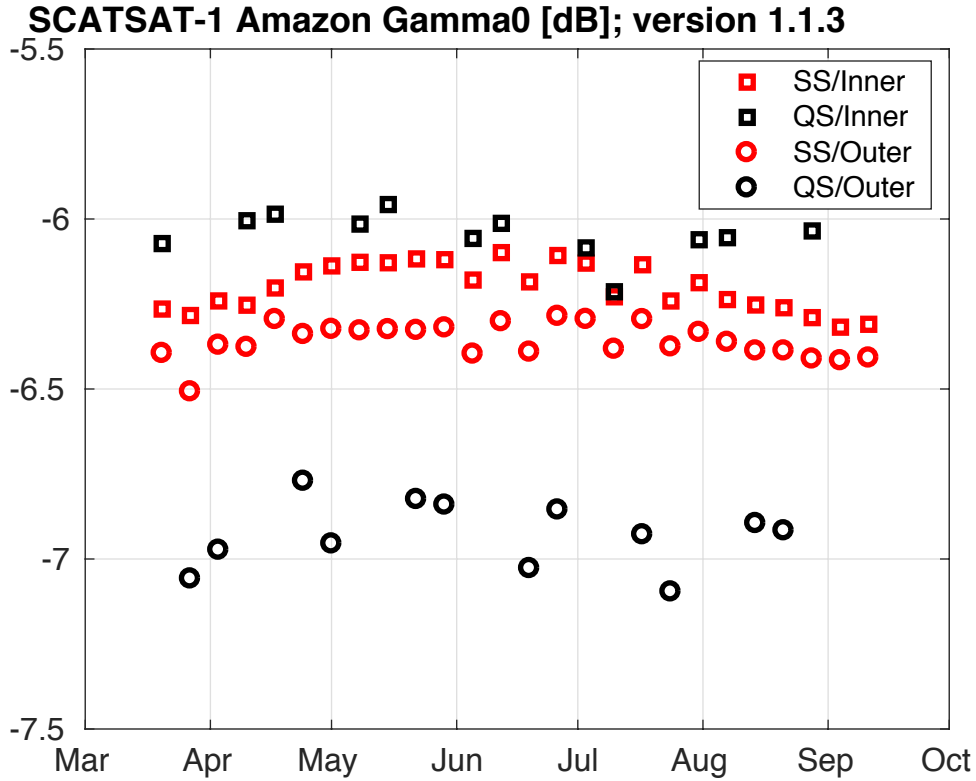
RS (low SNR 2)	Ocean via QS	Amazon via QS	Difference	Used in proc.
HH adjustment	+0.07 dB	+0.25 dB	-0.18 dB	+0.16 dB
VV adjustment	+0.17 dB	+0.28 dB	-0.11 dB	+0.23 dB

OSCAT	Ocean via QS	Amazon via QS	Difference	Used in proc.
HH adjustment	+0.53 dB	+0.15 dB	+0.38 dB	+0.53 dB
VV adjustment	+0.30 dB	-0.06 dB	+0.36 dB	+0.30 dB

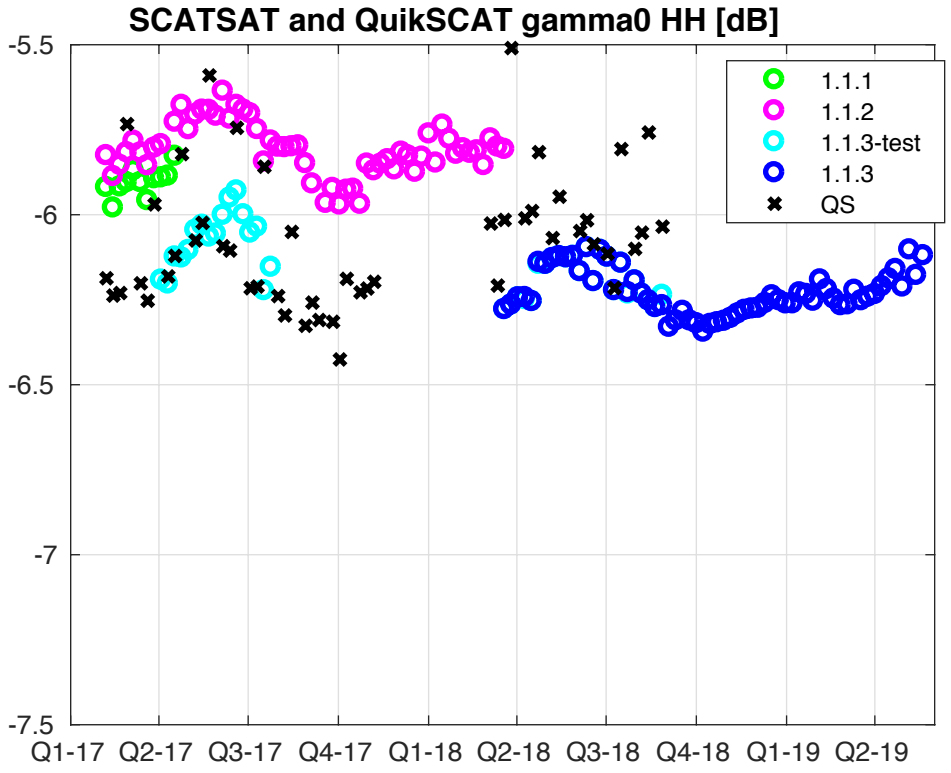
Updated Calibration Estimates

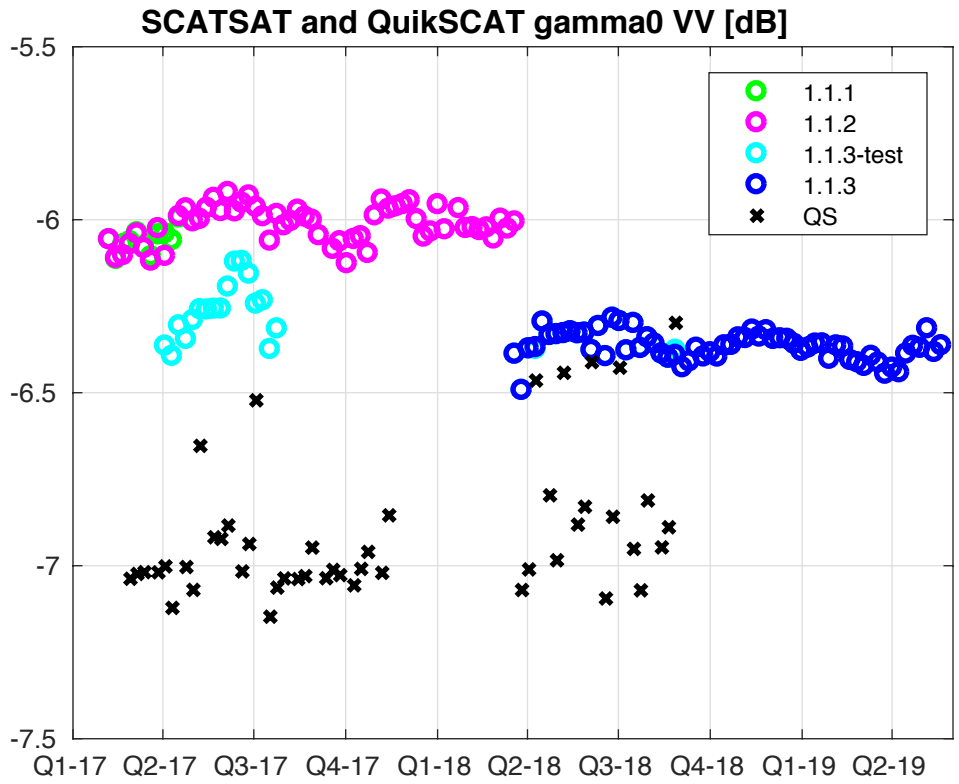
- Using 2018 QuikSCAT and 1.1.3 SCATSAT data
  - QuikSCAT at correct incidence angles to match SCATSAT.
  - Ocean: HH: +0.24 dB; VV: -0.56 dB
  - Land: HH +0.01 dB; VV: -0.68 dB (+0.15 / -0.54 without LTOD correction)





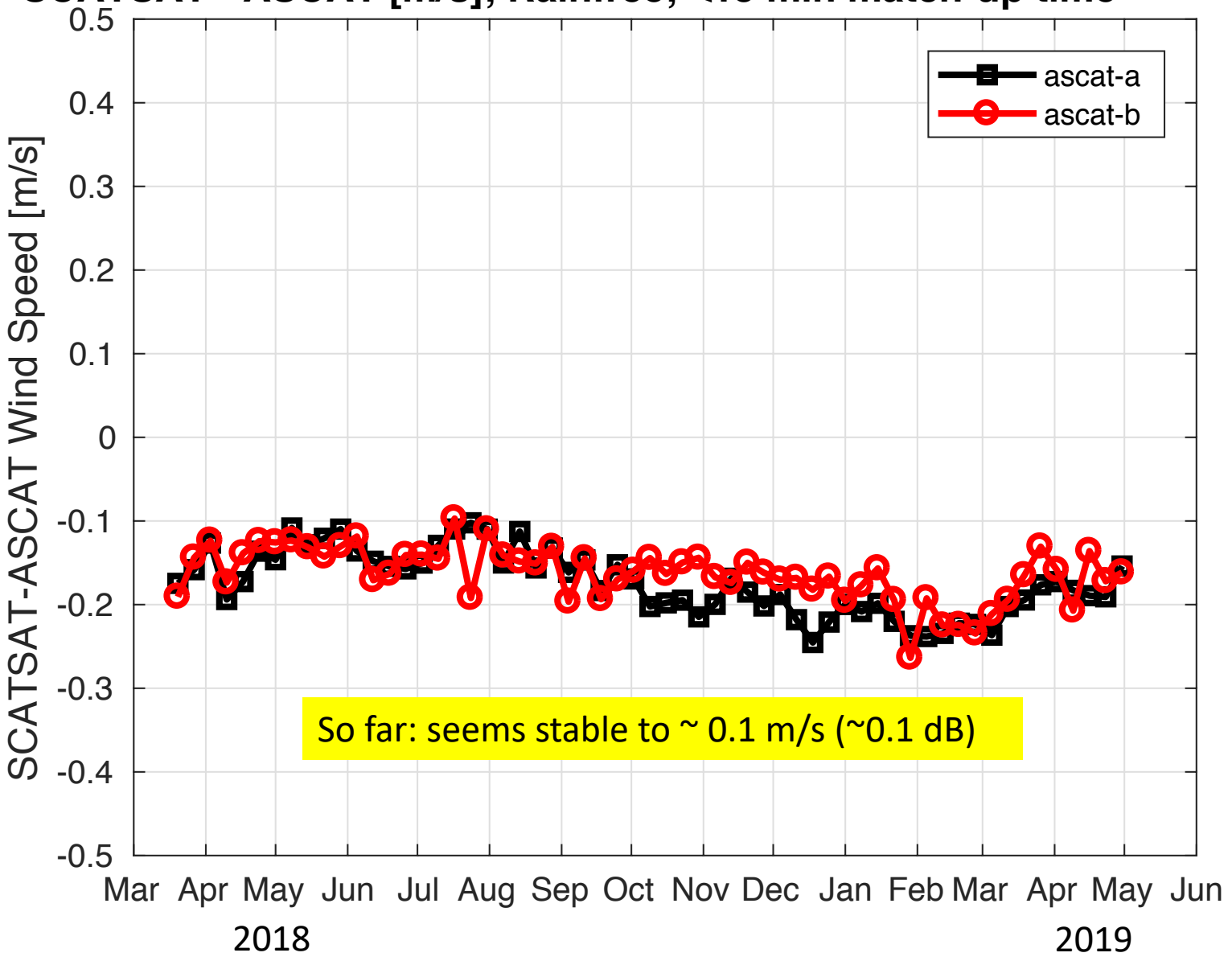
SCATSAT Calibration Stability over Amazon





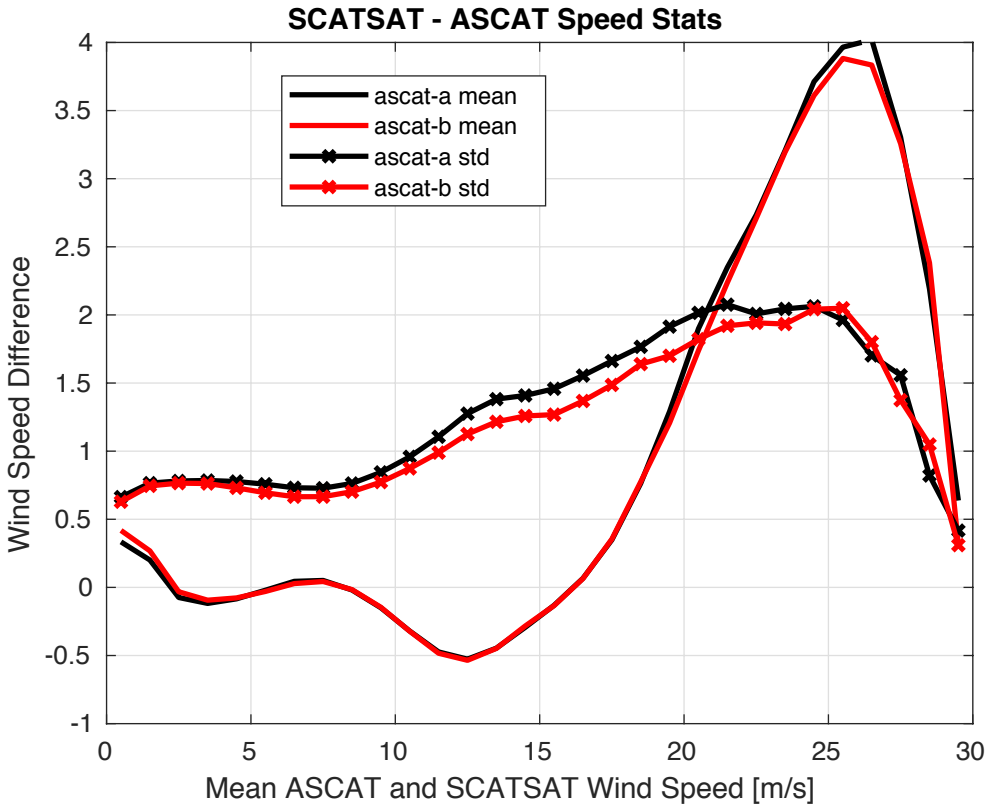
Calibration Stability over Ocean

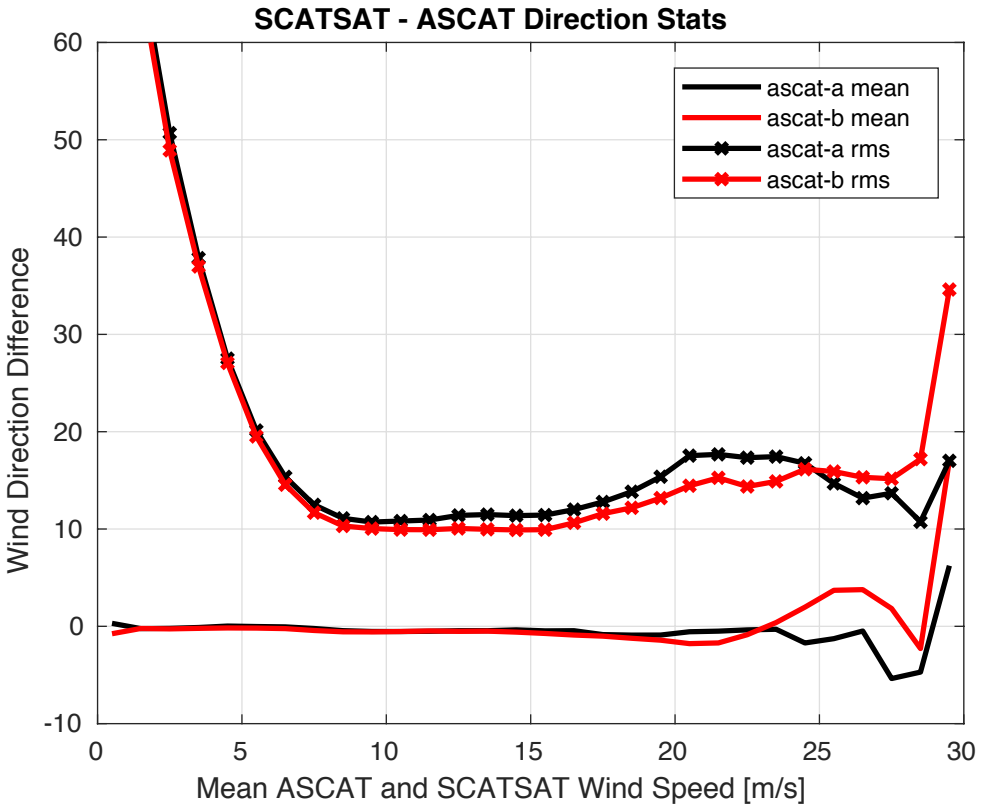
- *QuikSCAT was turned off at end of August 2018*.
- Only have contiguous SCATSAT 1.1.3 data since March 2018.
- We plan to use ASCAT-A/B collocations to track the calibration stability.
  - Triple-collocation of SCATSAT, ASCAT, + (NWP, buoy, …etc), many options.



NRT Data validation

Clearly meets QuikSCAT science reqs: 2 m/s (<20 m/s), 10% (>20m/s) and 20 deg (RMS)





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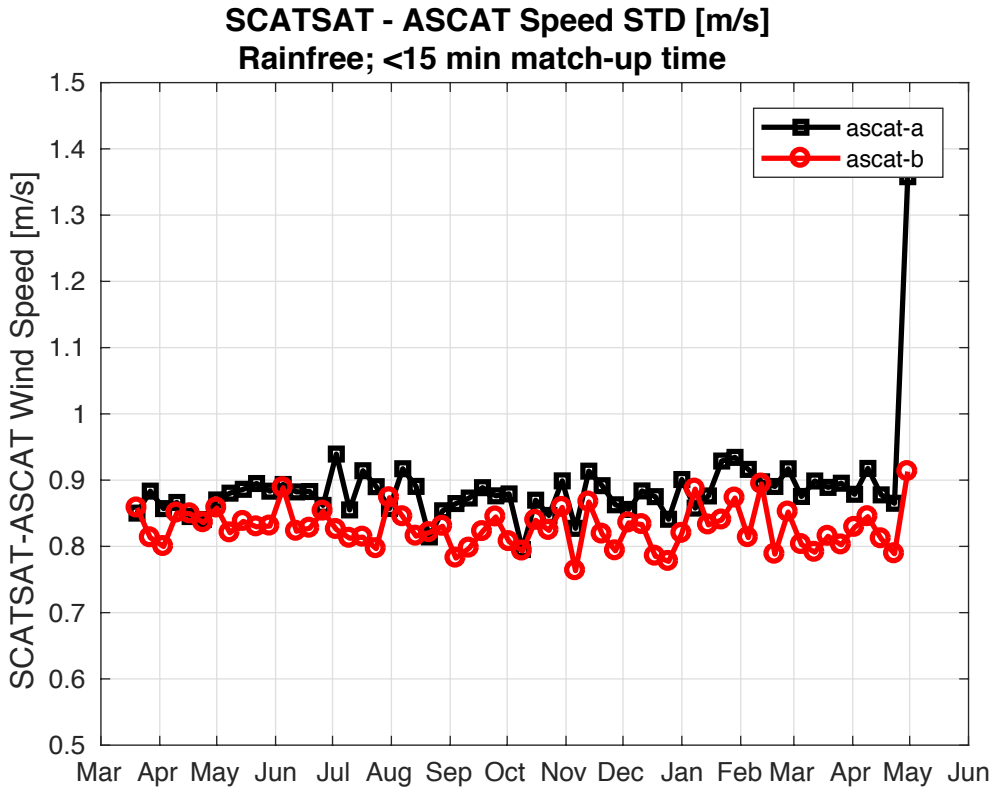
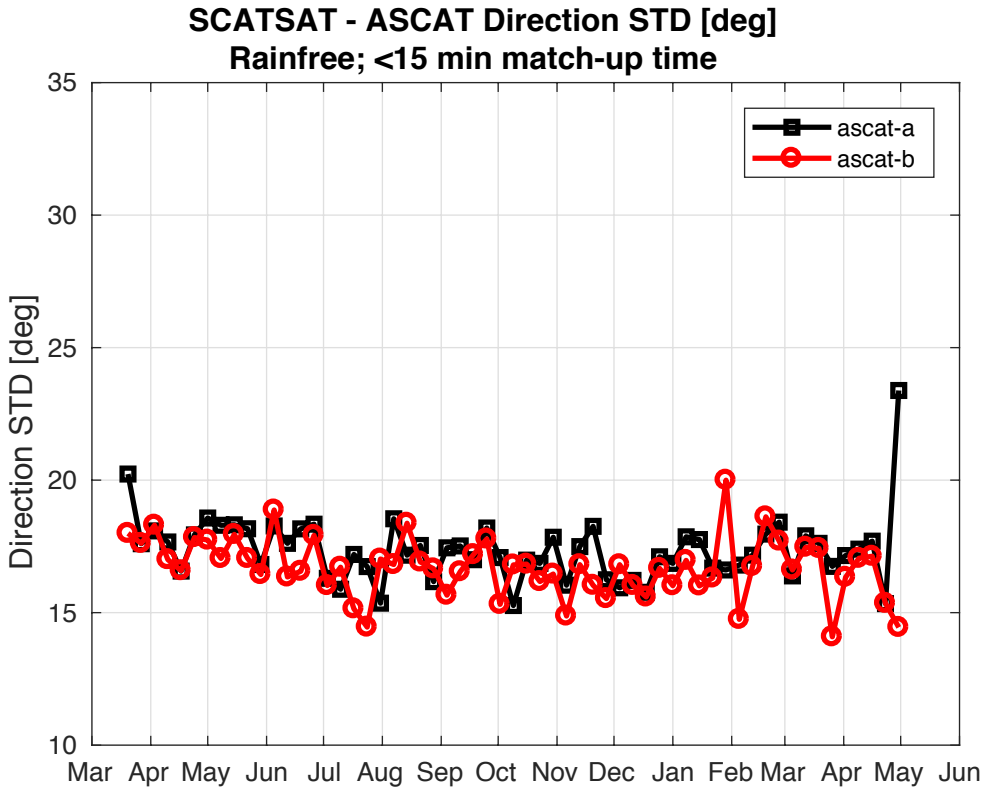
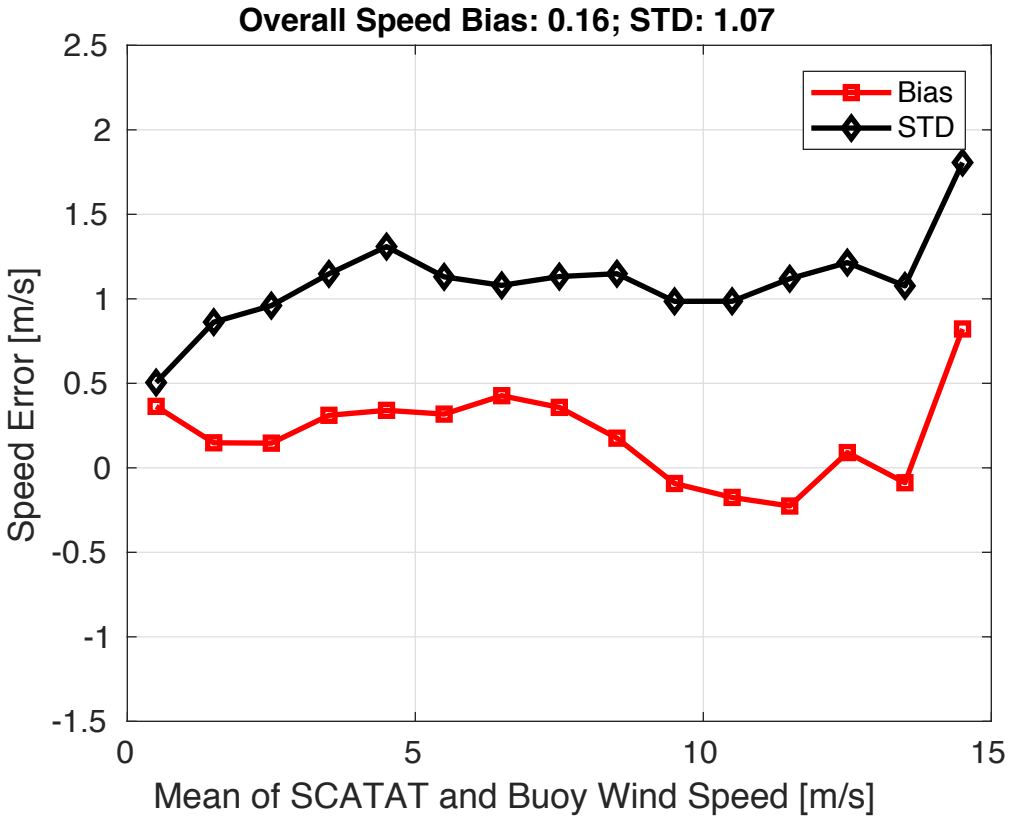
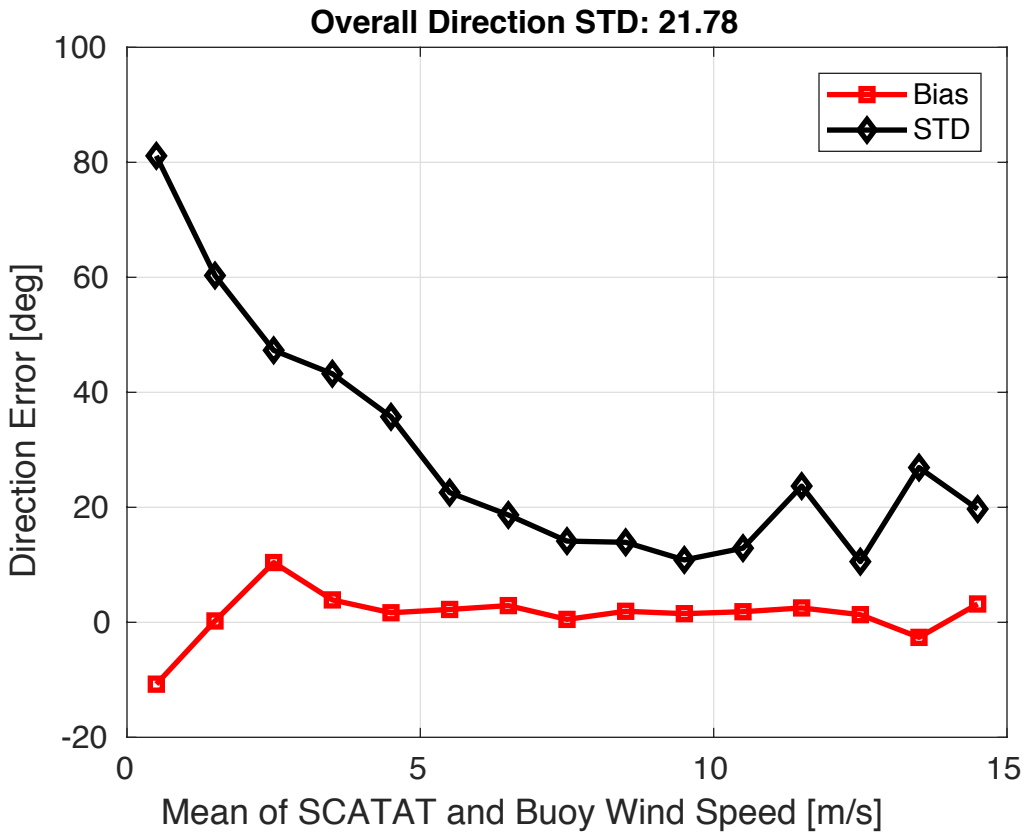


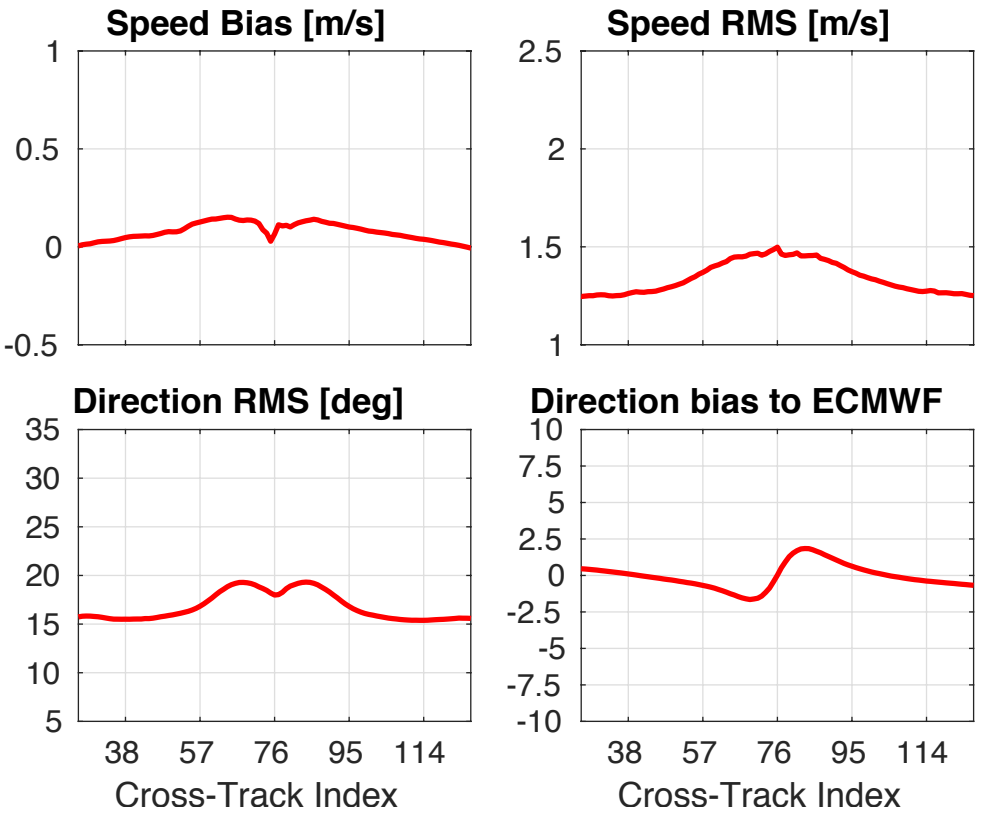


NRT Data validation vs Buoys

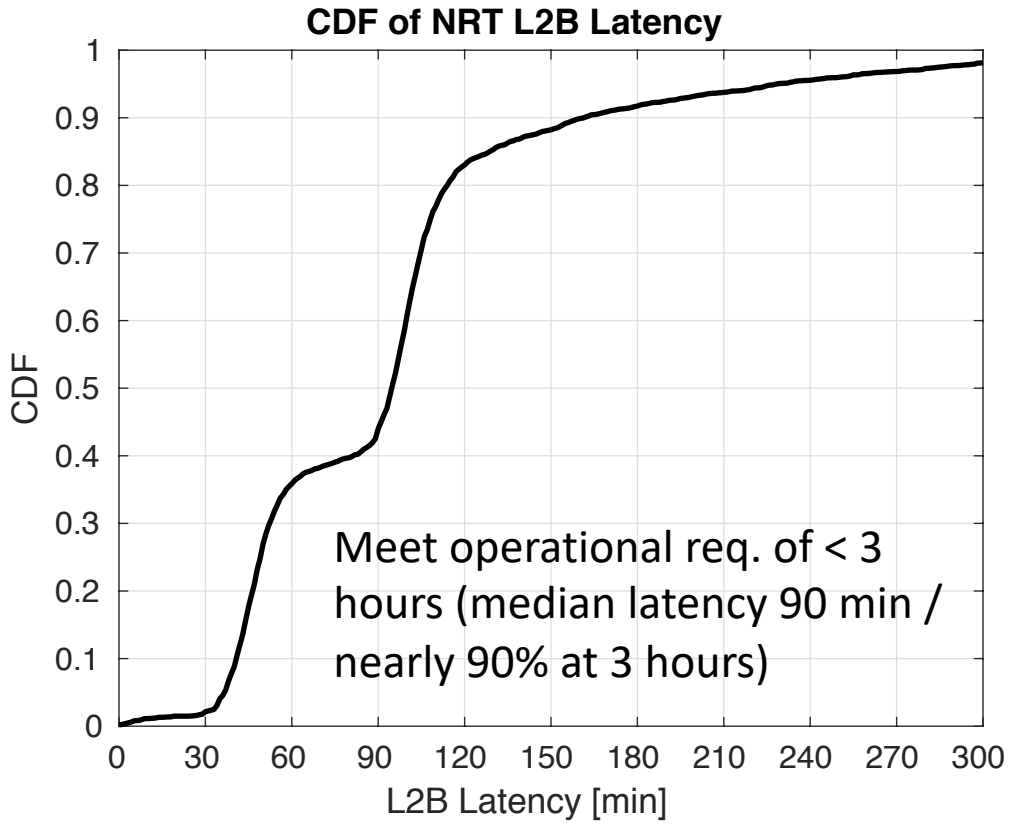




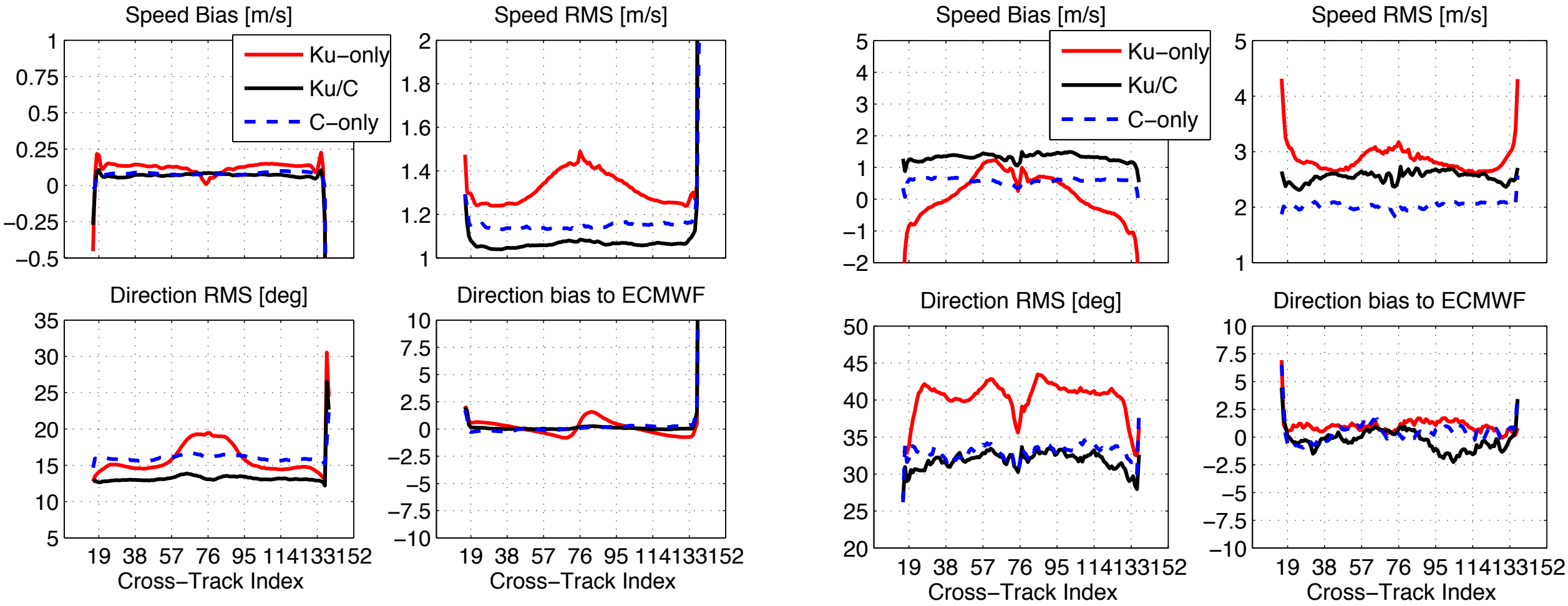
NRT Data validation and latency



vs ECMWF
ECMWF speed in [3, 30]

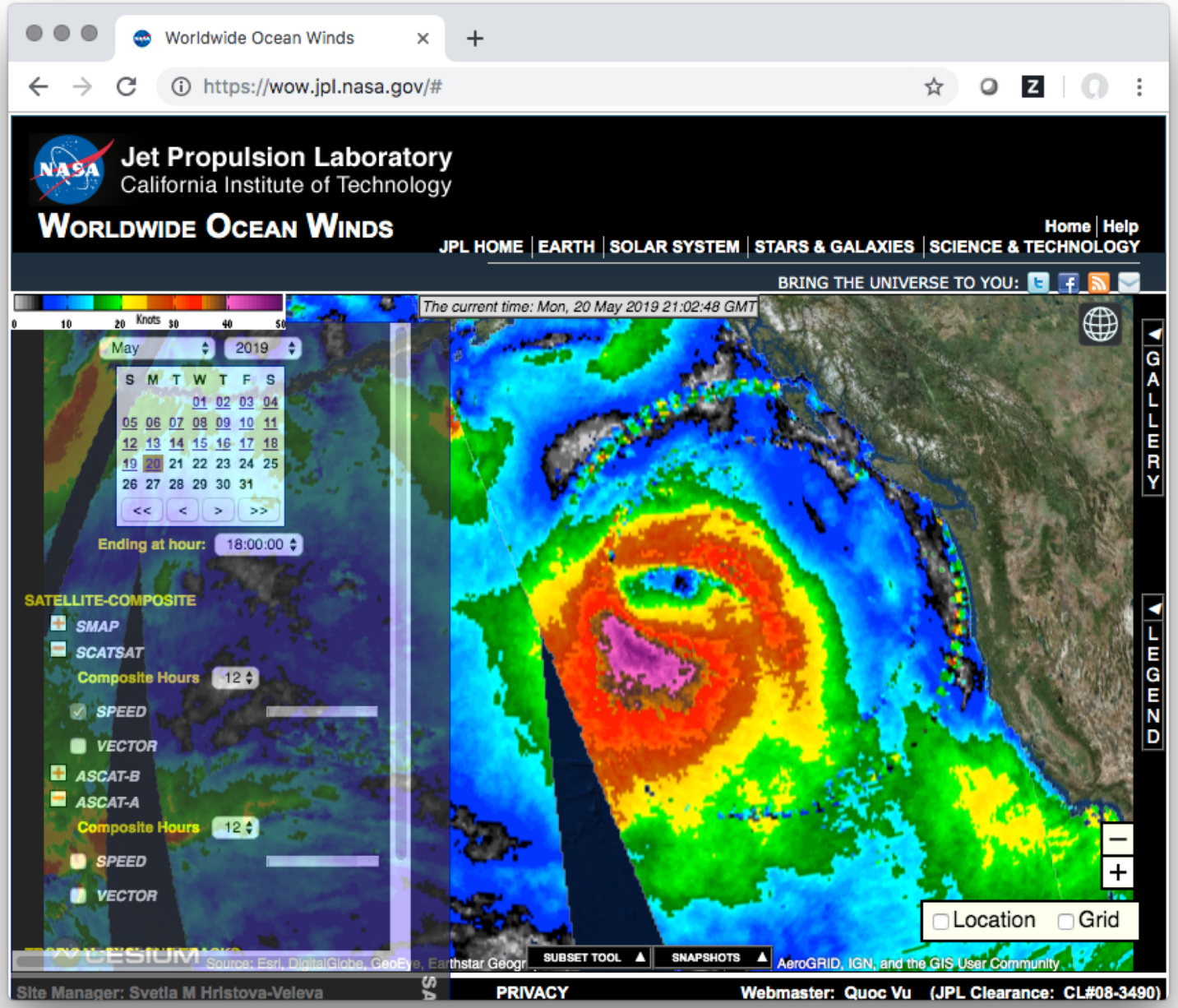


Preliminary C/Ku Winds



Ring Artifacts

- Some revs have entire scans where data does not seem right.
- Only see issues on ground, not in scan angle / orbit angle space => geolocation error.
  - σ_0 seems to be right.
  - Gives large wind speed errors.



Summary / Future Work

- NRT data has been distributed since June 2018.
  - Consistently processed since March 2018.
  - Meets QuikSCAT science requirements (2 m/s; 20 deg).
  - Has median latency ~90 minutes from sensing time to data availability.
- Final 1.1.3 cross-calibration with QuikSCAT is essentially unchanged.
- Preliminary C/Ku data product generated for testing.
- Future Work:
  - Climate-quality SCATSAT version 1.0 (early FY20):
    - Implement KuSST GMF used for QuikSCAT and RapidScat.
    - Tweak beam balance.
    - Cross-track adjustment.
    - Stiles et al new neural-net rain correction based on ASCAT.
    - Released via PODAAC.
  - Release initial version of joint C-Ku data processing (mid/late FY20).
    - Address ASCAT calibration.
- NRT data available at sftp://rscatftp.jpl.nasa.gov; E-mail fore@jpl.nasa.gov for access.