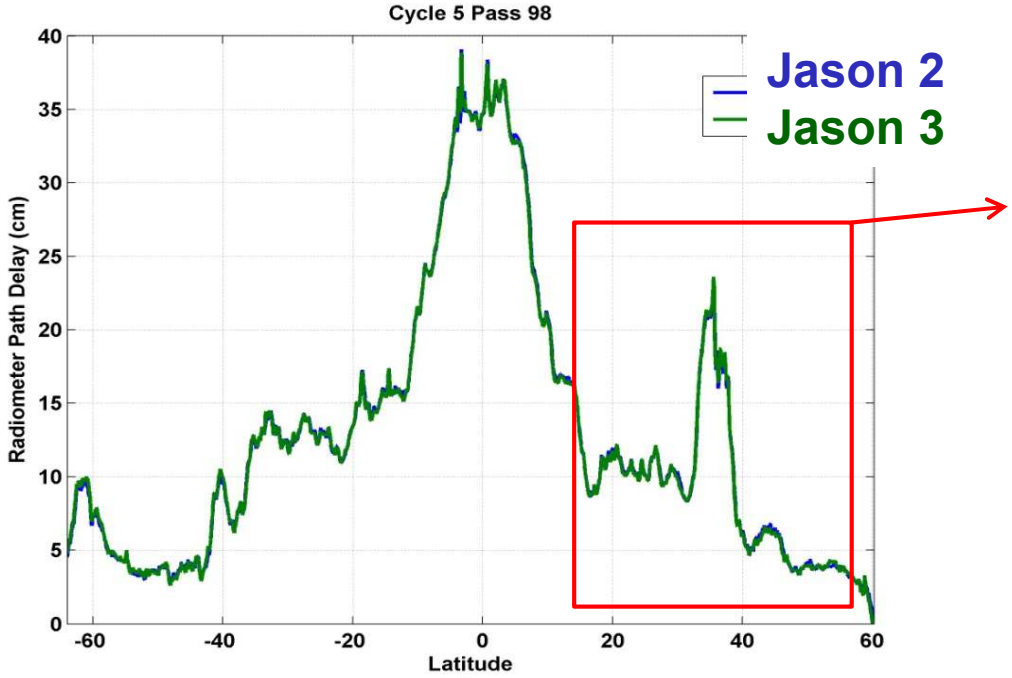
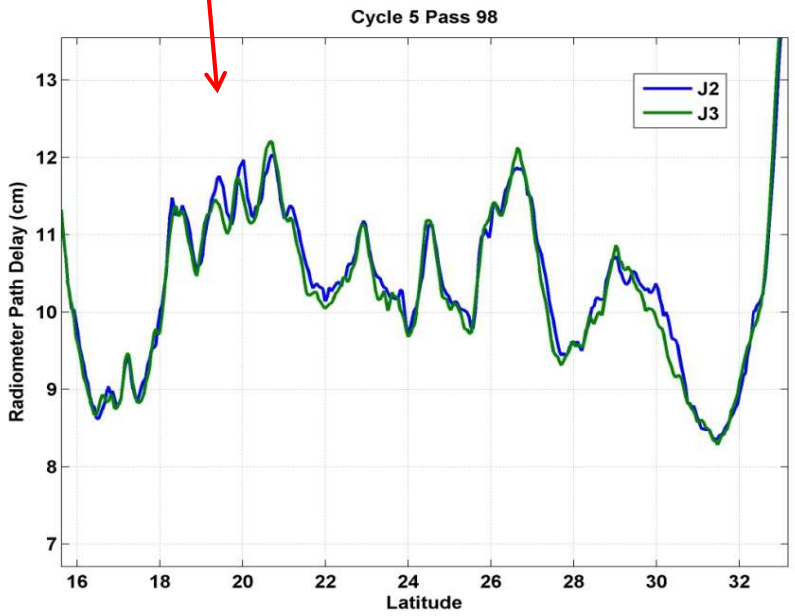
Instrument Processing: Corrections Summary

7 oral presentations and 7 poster presentations

Covered radiometer wet tropospheric correction, sea state bias correction and flags

Jason-3 AMR Performance Assessment

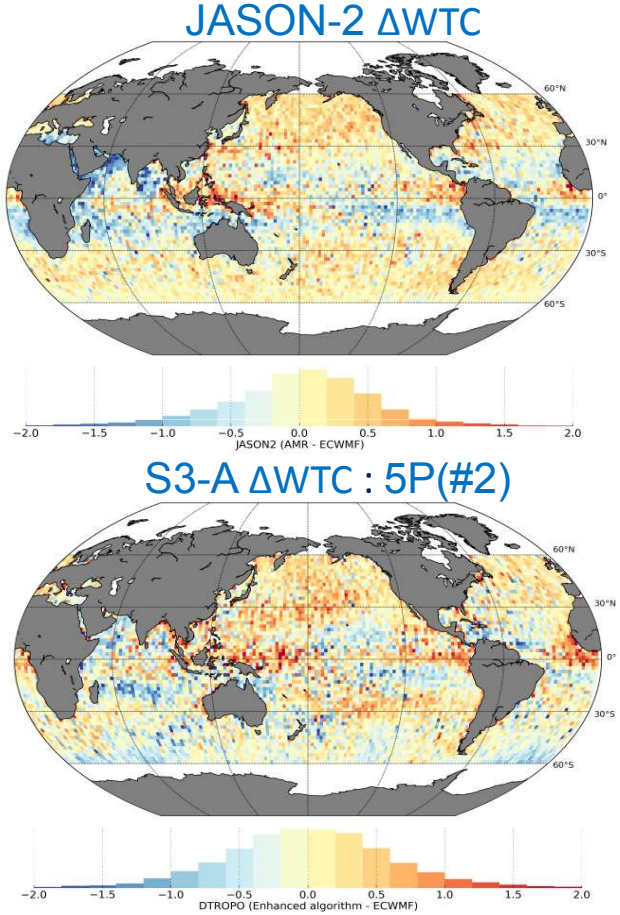




- Jason-3 AMR performing well
  - Jason-2 and Jason-3 producing identical PDs to within 3mm
- Jason-3 is experiencing a noise diode drift which is removed using the cold sky calibrations and the vicarious cold reference (ocean)

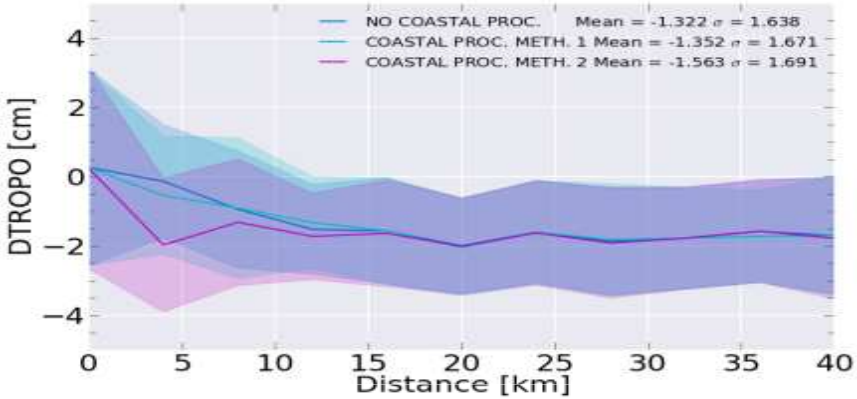
Sentinel-3 MWR Performance Assessment

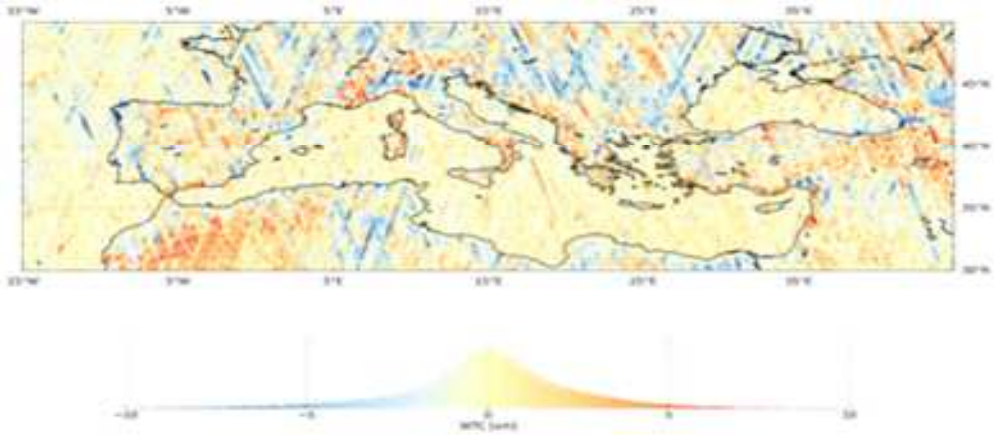
- Very good performances of S3A/MWR since switch-on: Global good agreement with other radiometers
  - Good performances for hottest BTs
  - Lowest Bts are cooler than other MWR, the new set of calibration parameters address the issue
- Assessment of wet tropospheric correction
  - Good performances on the wet tropospheric correction for both new NN algorithms
- Perspectives
  - New radiometer calibration timeline to reduce data gaps in L2 products

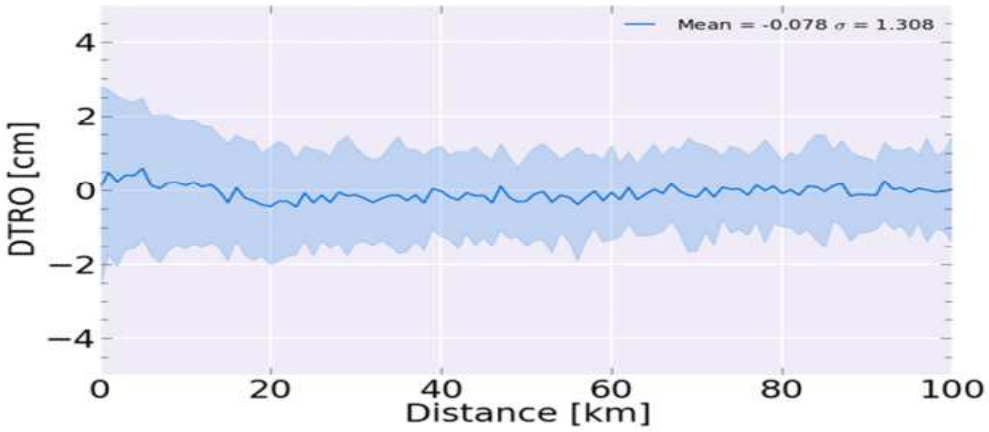


Future Microwave Radiometers for Atmospheric Correction

- Study to evaluate new optimized instrument design and retrieval algorithms for wet tropospheric correction
  - Focused on improvement in coastal areas, using benefit from high-frequency channels
- Optimized radiometer
  - Channel selection based on retrieval performance and instrument design constraints (e.g. cost, feasibility, resources)
  - 23.8, 36.5 50.3, 53.596, 89, 183+/-11 GHz
- Combination of high-frequency channels and 1D-var approach promise to the capability to downscale retrievals not limited by instrument resolution





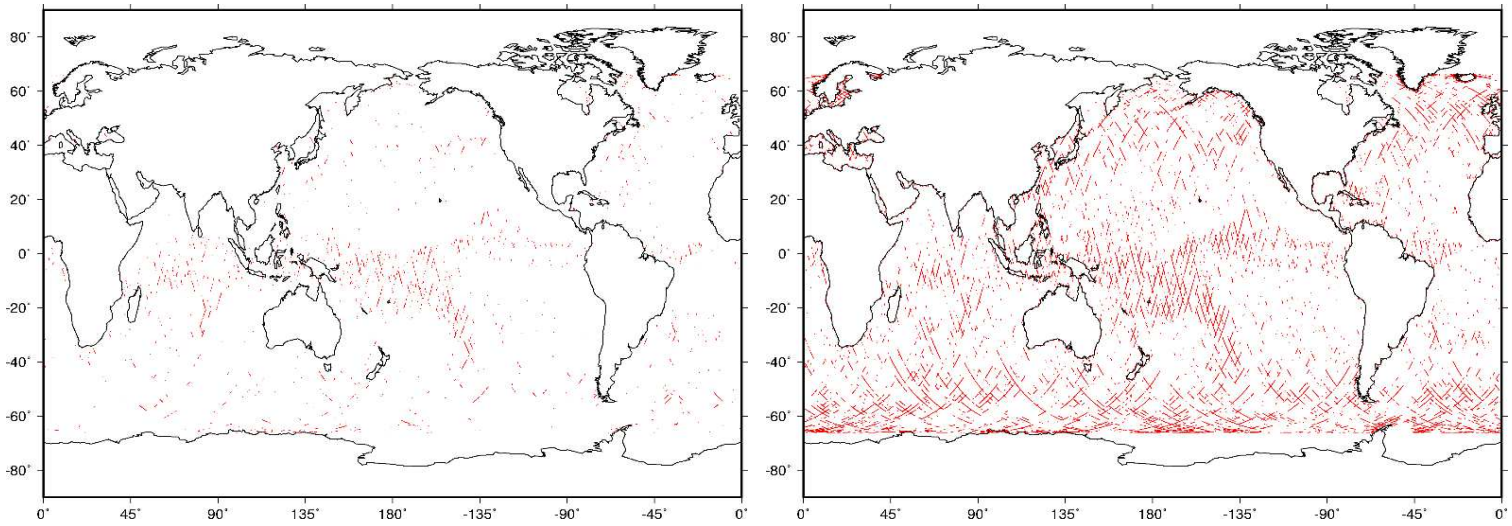


Improvements to rain flag

- Several issues identified with current implementation of Jason-3 rain flag, resulting in an anomalously large number of flagged values
  - Rain flag seemed to be based only on CLW
  - There are biases between expected values from lookup table (LUT) vs. measured values of s 0
  - The rain flag is set when rad_surf_type > 0 (coastal zones) & qual_alt_1hz_ku > 0

- Corrected algorithm resulted in more reasonable amount of flagged values
  - Future improvements could consider SST dependence of differential backscatter at Ku and C-bands for more accurate flagging

Jason-3 OGDRs: 2016/02/12-22

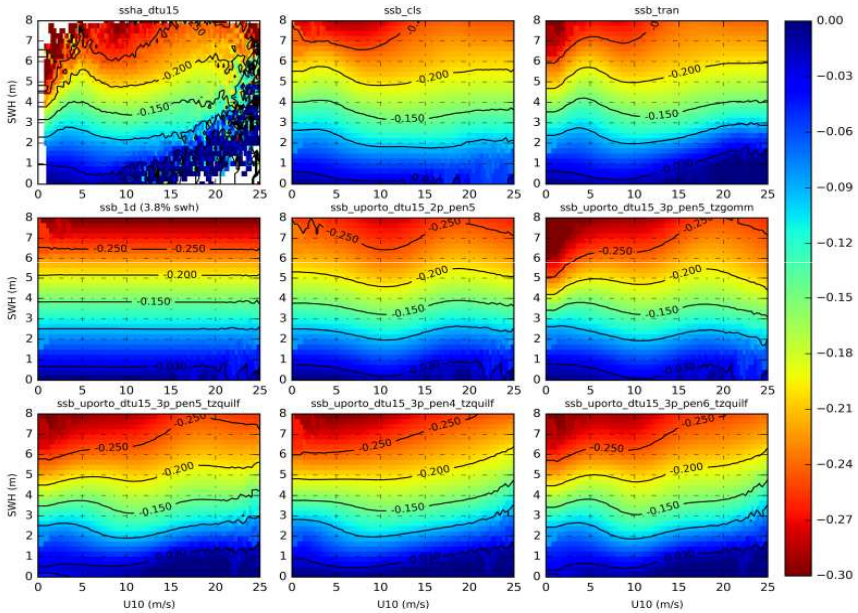


Corrected Rain Flag

Preliminary Rain Flag

Consistent set of SSB models for reference missions

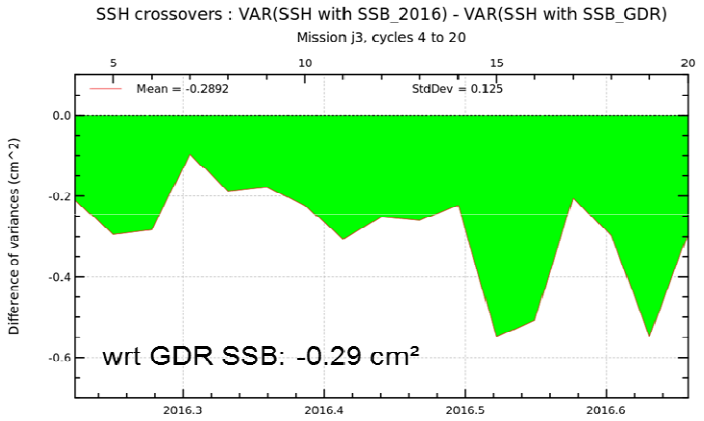
- Comparison of various SSB models with UPORTO SSB model
- For Topex and Jason-1, the validation of UPORTO SSB model is in line with the standard SSB models currently available
- The proposed approach is capable of generating a reliable model with a limited training dataset (20 cycles)
- For Jason-2 and -3 the proposed model achieves a reduction of SLA variance in 1% when compared with standard SSB models

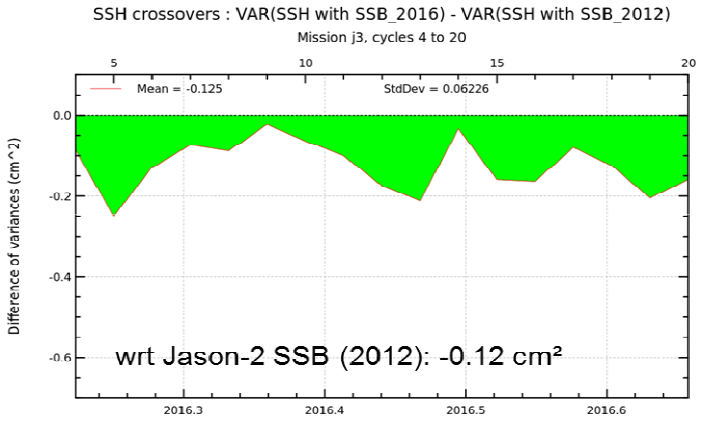


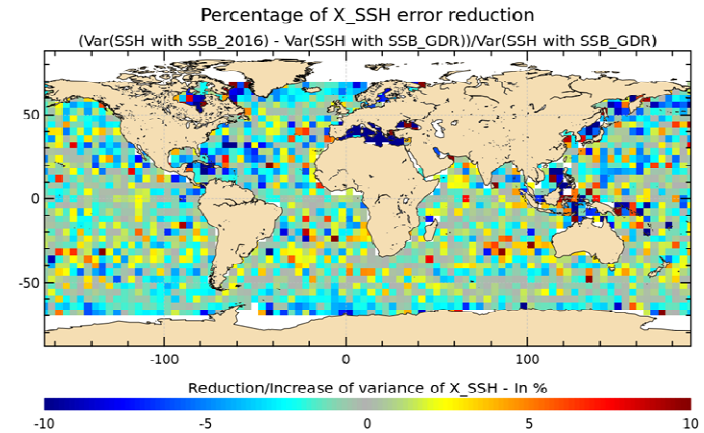
Improvements to Jason-3 SSB Correction

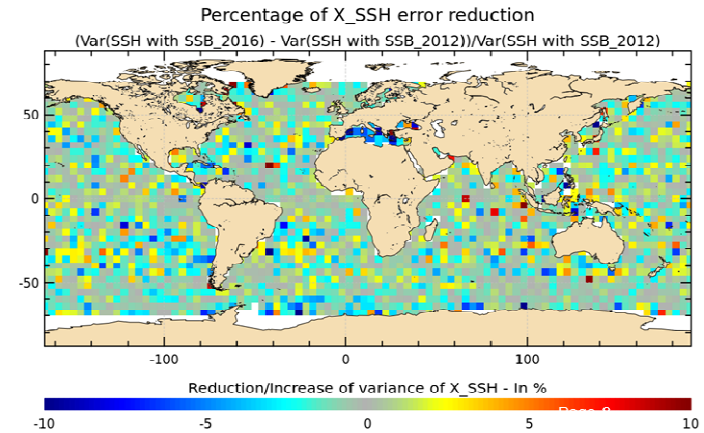
- Preliminary Jason-3 SSB models (2D and 3D) have been computed, will be re-computed after 1-year of GDR data

- Alternate 3D SSB models derived from collinear SSH differences have been computed and show some differences with standard 3D models derived from SLA data; further comparisons are needed.









Roundtable Discussion/Recommendations (1 of 2)

- **Jason-2 cold sky maneuvers**
  - Cold sky maneuvers have proved valuable for Jason-3 and should be continued for Jason-2, at least for inter-leaved mission
    - Provide data to stabilize long term record
    - Provide additional insight into calibration behavior which may benefit first 8 yrs of mission

- **Change in GDR production schedule allowing up to 90-day latency for optimal use of cold sky data**
  - Proposal fully supported by IPC
    - Best quality product, lower potential for large changes to GDR later on
    - Having the best possible calibration on GDR extends time between reprocessing
    - All GDRs have equal uncertainty, instead of some having higher uncertainty
    - Median latency only changes +5 days (65 days compared to 60) – user community input from other splinters

Roundtable Discussion/Recommendations (2 of 2)

- **Calibrator for Sentinel-6 (Jason-CS)**
  - IPC supports long term stability requirement and need for calibrator on Sentinel-6
    - Thanks to the project for seeking OSTST comment on this important issue
    - Radiometer calibration is largest source of error in measured GMSL trend – new requirement for stability on Sentinel-6 ensures stable measurement for next decade
    - Radiometer design for Sentinel-6, which includes calibrator and new risk compared to Jason-2/3, will still meet equivalent reliability standards as other operational instruments, including prior Jason radiometers
    - Risk of failure no different than any other part on spacecraft (all components meet operational reliability requirements)