Meeting Objectives

- ✓ **Review Science Teams Readiness for JPSS-1**
  - ✓ SDR/EDR Algorithm Development/Improvements for J1
  - ✓ R2O, Support for Operational flow Transitions
  - ✓ Schedules and Milestones
  - ✓ Cal Val plans
  - ✓ Major Accomplishments/Highlights Moving Towards J1
- ✓ **Review Science Teams Support for Suomi NPP**
  - ✓ Suomi NPP Long Term Monitoring and Adaptation to JPSS-1
  - ✓ Integrated Calibration Validation System (ICVS) for SDRs/EDRs
- ✓ **Interaction/Communication Among Stake Holders**
- ✓ **Feedback from User Community**

Please submit the RFA form or email me: Lihang.Zhou@noaa.gov

SDR Overview (Ken Carey)

- The STAR JPSS SDR team has been reorganized to enhance the management and technical cohesiveness, effectiveness and delivery. STAR has close working relationships with NASA and vendor scientists for each of the instruments. The JPSS SDR major accomplishments in 2015 included:

- Completed comprehensive SDR Cal/Val Plans for JPSS-1. The cal/val tasks are presented with clear role and responsibility, task objective, expected outcomes, and lessons learned from SNPP
- Developed an offline CrIS full spectral resolution (FSR) SDR processing system and made the FSR products available to user community
- Developed ATMS radiance-based radiometric calibration, replacing Rayleigh-Jeans approximation in two-point calibration system
- Developed J1 VIIRS DNB waiver mitigation and delivered pre-operational software to IDPS program on-time, and implemented the operational straylight correction in DNB band
- SNPP OMPS earth view SDR products have reached the validated maturity level after updating LUTs of wavelength scale, solar irradiance and earth view radiance coefficients
- Integrated Cal/Val System (ICVS) – Lite version was successfully transitioned to GRAVITE for NASA Flight and OSPO operational uses

ATMS SDR Path Forward
Ninghai Sun

- JPSS-1 ATMS Readiness
  - Prepare for JPSS-1 ATMS TVAC regression testing
  - Derive JPSS-1 ATMS PCT using full radiance process algorithm using TVAC regression testing datasets
  - Test reflector emissivity correction algorithm
  - Evaluate striping noise for JPSS-1 ATMS
  - Validate JPSS-1 ATMS mounting matrix
- Prepare for ATMS SDR FRP operational implementation
- Develop ATMS reflector emissivity correction operational code for IDPS implementation
- Develop ATMS geolocation accuracy trending package for ICVS
- Keep supporting S-NPP ATMS scan reversal activities

VIIRS SDR Breakout Session 6a Summary (Changyong Cao)

- A successful and productive session;
- Presentations focused on J1 VIIRS readiness, waiver mitigation, instrument performance, and validation capability development;
- Presenters included STAR scientists, instrument vendor, NASA, and the Aerospace Corp. which facilitated excellent technical interchange.
- The team made significant progress toward J1 readiness:
  - STAR successfully delivered J1 VIIRS DNB geocode change as part of the waiver mitigation on schedule;
  - J1 VIIRS SDR LUT ver1.0 has been delivered;
  - Completed prelaunch data analysis and instrument characterization;
  - RSB autocal will be turned on in a week;
  - Validation capabilities have been expanded, including new tools for waiver validations;
  - Cal/Val plan has been developed, with additional field campaign preparation planned.

VIIRS SDR Breakout Session 6a Actions (Changyong Cao)

- A number of actions have been generated to address issues and challenges:
  1. Prepare and provide simulated images of I3 with noisy detector (d4), and DNB images with op21,op21/26 for the EDR teams;
  2. Investigate possible M5 biases relative to MODIS using spectrally flat targets;
  3. Determine the J1 VIIRS DNB extent of the extended earth view based on useful earth view scan angles;
  4. Prepare and provide the official parameters for the J1 VIIRS polarization for EDR teams to use in their algorithms;
  5. Re-assess the need for quarterly WUCD; deep dive analysis on BB calibration to mitigate impacts on SST spikes;
  6. Prepare reprocessing by researching the best approaches leveraging similar activities for the RSB; perform feasibility study of a SDR L1.5 product working closely with the SST team;
  7. Further verify the effect of NOVAS library updates (initially estimated to be up to 400m near the poles).

CrIS Breakout Session
Yong Han/Dave Johnson

- 8 Presentations cover various areas critical for both S-NPP and J1 mission with a focus on J1 readiness
- **Preliminary J1 SDR algorithm and calibration LUTs have been delivered and algorithm updates are progressing towards an on schedule delivery.** The cal/val team continues to make good progress in optimizing the performance of the SDR algorithm.
- **CrIS radiometric performance for SNPP and J1 is approaching levels sufficient for climate trending.**
- J1 and SNPP CrIS spectral calibration accuracy is on the order of 2 ppm.
- The J1 CrIS bit trim and impulse noise masks are ready for launch, and based on SNPP data techniques show promise for correcting the remaining few radiation spikes that slip through the current impulse mask.
- Good progress is being made on **further improvements to geolocation accuracy at the ends of the CrIS cross track scan.**
- A 2-hour CrIS SDR team face-to-face meeting was held on Thursday afternoon to discuss ongoing and future work

Sounding
Mark Liu/Tony Reale

- 16 presentations
- ***NWS forecasters support use of NUCAPS sounding products as a valuable tool via AWIPS-2***
- Presentations focused on scientific performance, utility and visions for NOAA sounding EDR on a global scale.
- NOAA/CPC uses OLR for precipitation diagnostic and verification
- Trace gas products are evolving with applications for air quality monitoring
- NASA OCO-2 very successful and good for CrIS CO2 validation
- Hyperspectral sounder on GEO (MTG) in 2019/2020 to provide new high resolution sounding and associated validation challenges
- CALWATER and other field campaigns provided hydrometeor and ozone testbeds
- International working group including NOAA/STAR coordinating on radiative transfer model comparisons and retrieval algorithms.

Ozone
Larry Flynn

- **The product session for ozone provided coverage of a busy and productive year for operations, applications and research.**

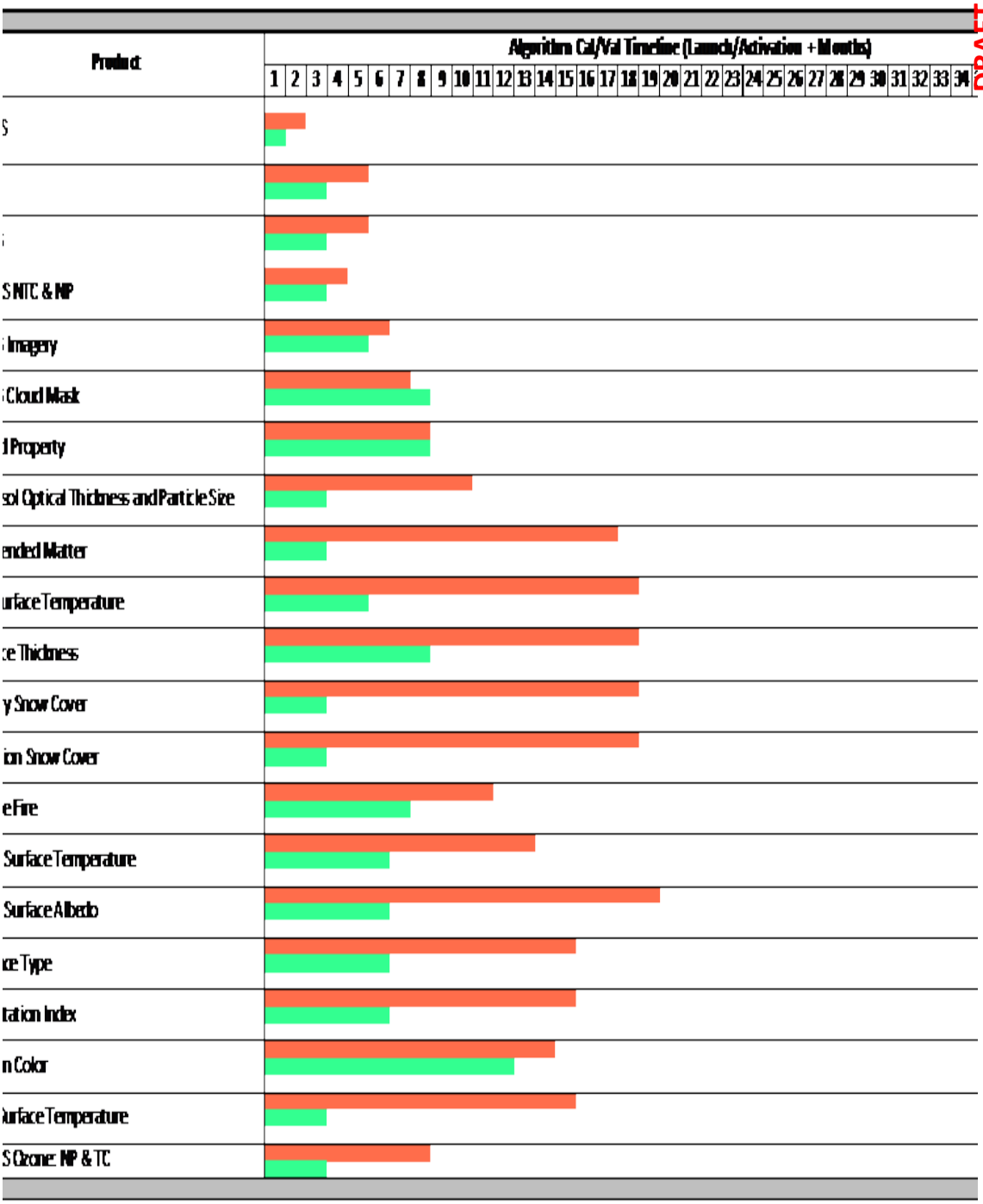
- **There was good progress as we delivered both the V8Pro and V8TOz as enterprise heritage algorithms and have high performing research versions of algorithms to generate SO2 and NO2 products.**

- **OMPS ozone products (total column, nadir profile and limb profile) are stable and precise and fulfill their role as the satellite component of NOAA's ozone monitoring system.**

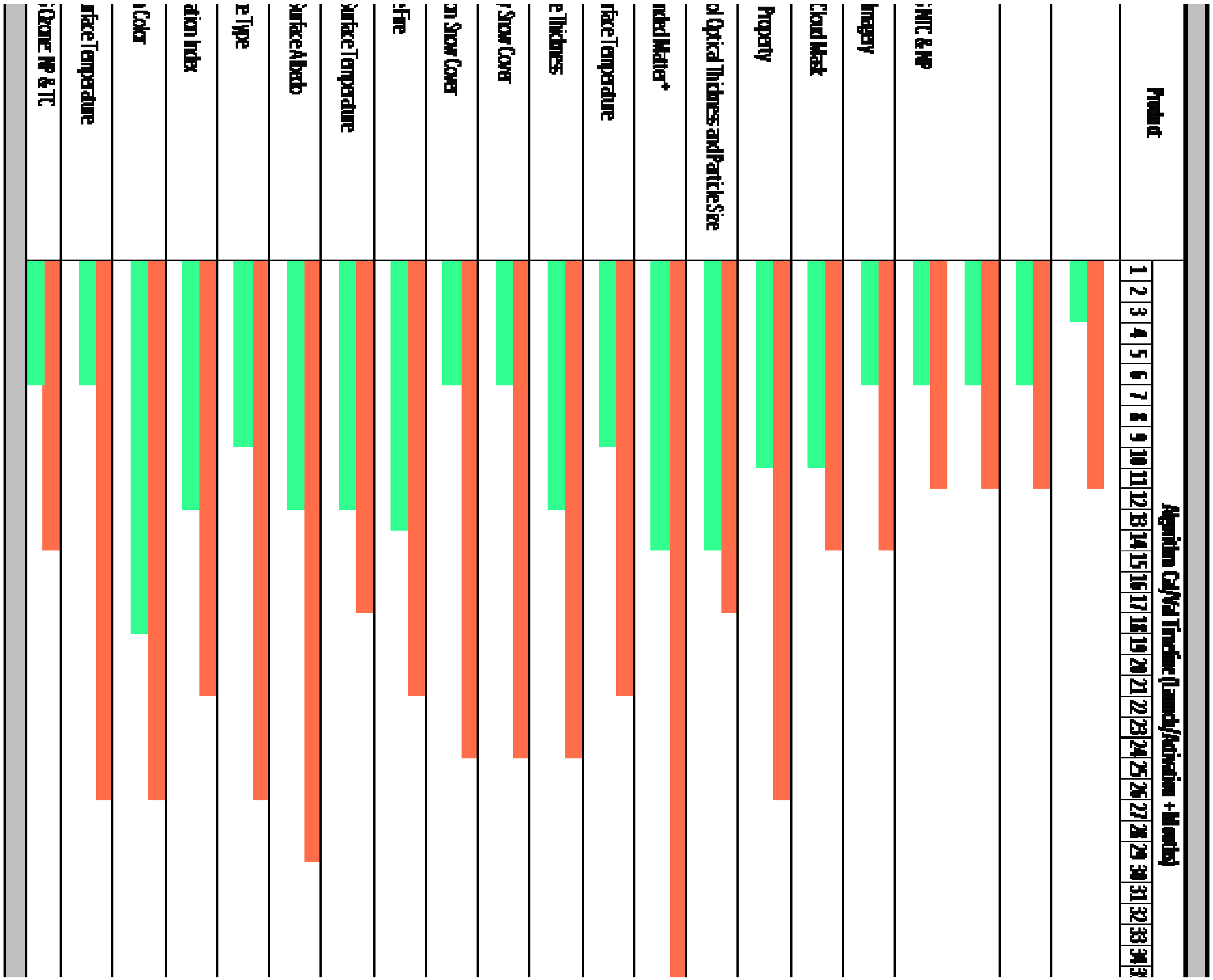
- **Projects are underway that show the added value of ozone and other OMPS products for air quality, hazard identification and aerosols applications.**

JPSS-1 vs. SNPP Cal Val Timeline Beta

DRAFT



JPSS-1 vs. SNPP Cal Val Timeline Provisional



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JPSS-1 vs. SNPP Cal Val Timeline Validated

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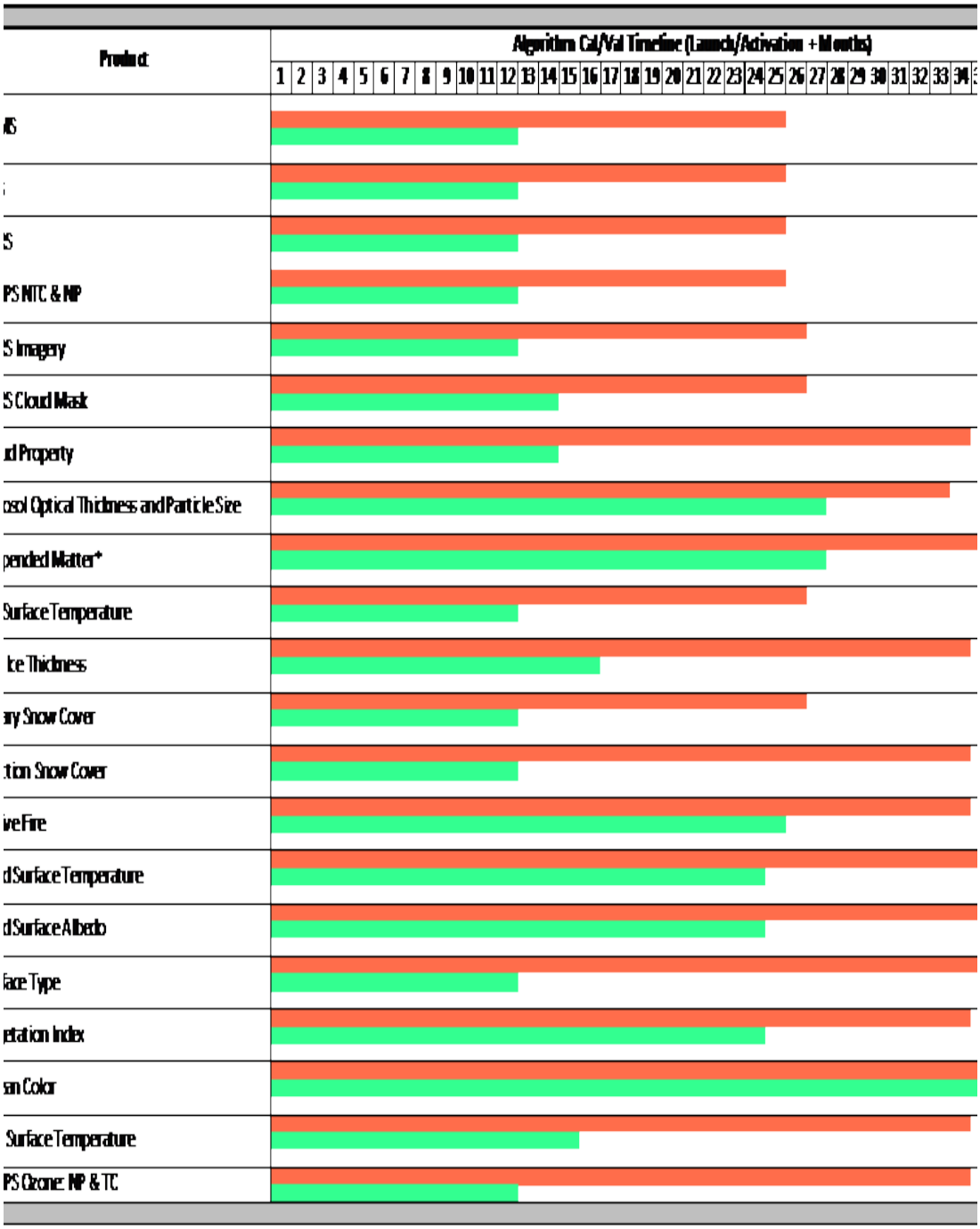


Near Term Actions

- **Finalize FY16 Plans**
  - Deliverables and Schedules
  - Finalize J1 Cal Val Plans
- **Enterprise Algorithm Detailed Roadmaps**
  - Each product team; timelines; reviews
  - Users interactions/facilitation
- **Coordinated Science Quality Data Processing**
  - Work with each team on setting up the capability
  - Work with key program stake holders on implementation, archive and distribution
- **J2 Waiver Analysis and Coordination**
- **Coming New JSTAR Teams:**
  - GCOM-W Cal Val/LTM (Paul Chang/Ralph Ferraro)
  - MIRS (Cal Val/LTM) (Jerry Zhan)
  - Vegetation Health/Fraction Cal Val/LTM (Marco Vargas/Felix Hogan)

NOAA NESDIS Mission & Challenge
From Steve's talk on Monday

Our mission is to deliver accurate, timely, and reliable satellite observations and integrated products and to provide long-term stewardship for global environmental information in support of our Earth Observation mission.

Our challenge is to provide these observations and products reliably while improving the information content and evolving to stay current with the expanding complexity of the Earth Observing contributors

We have made a lot of progress!
We still have a long way to go…

STAR JPSS 2015 Annual Sciences Team Meeting

Session 6c ATMS SDR Summary

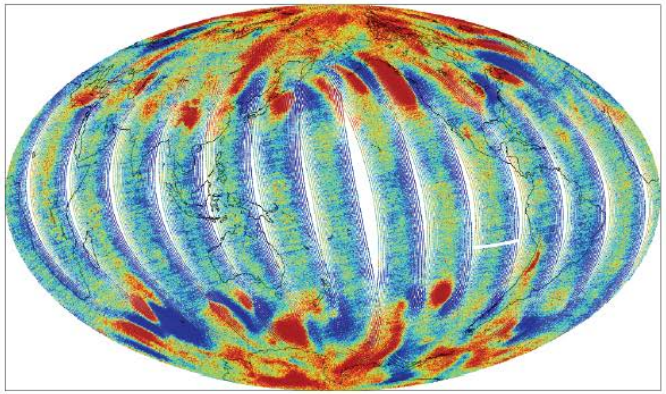
Prepared by: Ninghai Sun

Date: August 28, 2015

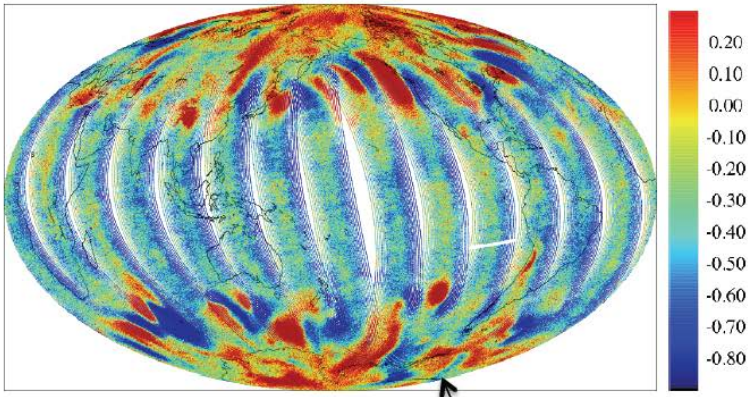
S-NPP ATMS Striping Mitigation

Global O-B Distributions of ATMS Channel 8

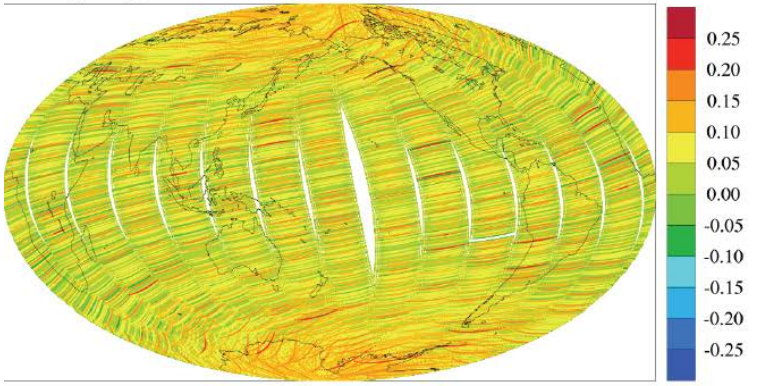
Before de-striping



After de-striping

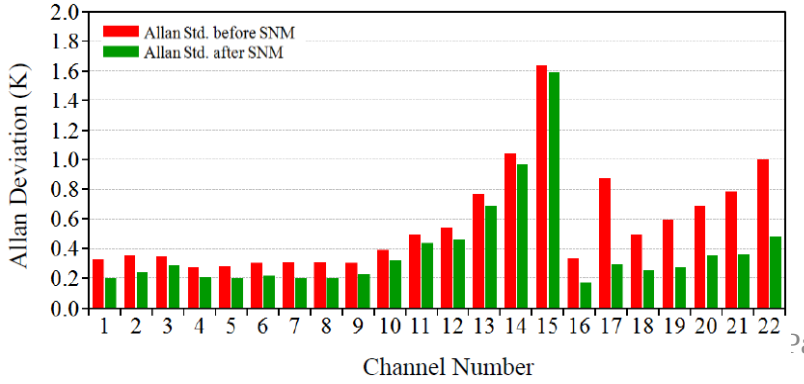


Striping noise filtered



Striping noise is not visibly seen anymore in the global O-B field after de-striping using the PCA/ SymFilter algorithm.

Channel noise is reduced after de-striping →



Xiaolei Zou, *et. al.* (UMD/ESSIC)

JPSS-1 ATMS Readiness

Summary of ATMS Status

- S-NPP flight unit status
  - Post-launch validation activities have confirmed S-NPP ATMS is meeting or exceeding its performance specifications (see papers in S-NPP special issue of JGR)
  - On-orbit testing of scan drive mitigation (reversals) is in progress

- J1 flight unit status
  - just completed 1 year of re-work, and begun environmental re-testing
  - If environmentals are problem-free, J1 unit installs on s/c in Nov
  - J1 observatory-level tests partly done using EDU as stand-in
  - J1 observatory-level TVAC probably in early CY2016
  - If those tests stay on schedule, then launch date is looking good

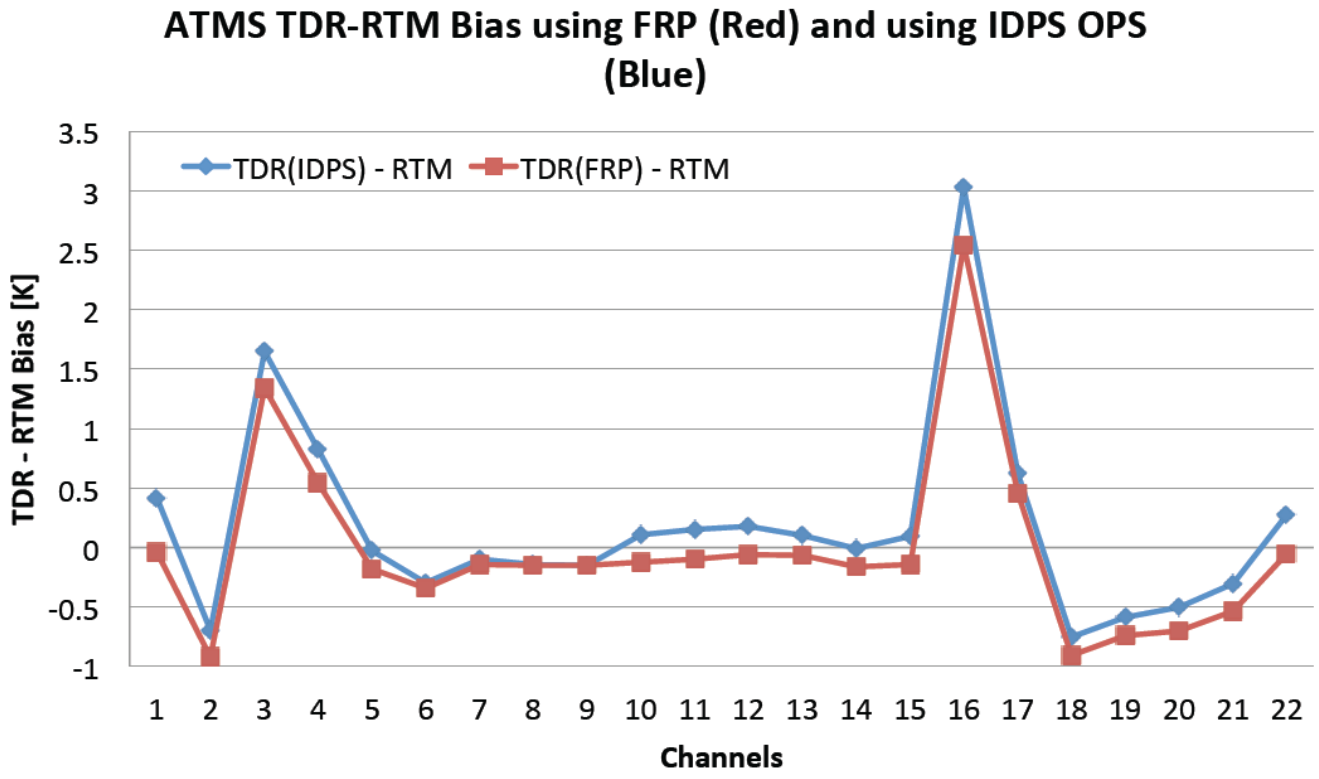
- J2 flight unit status
  - procurements have begun

Ed Kim, *et. al.* (NASA/GFSC)

ATMS SDR Full Radiance Process (FRP)

Global Mean TDR-RTM Bias

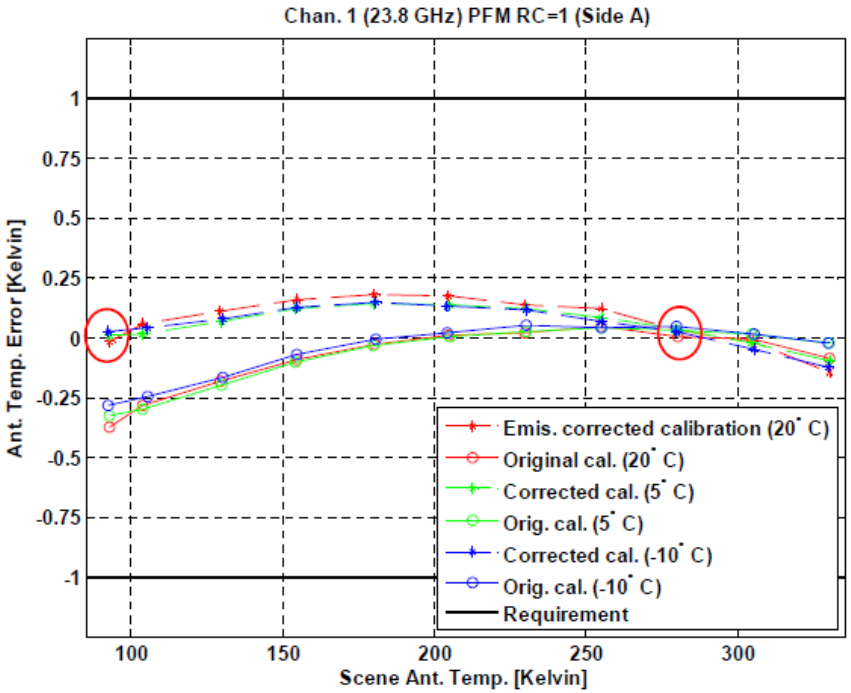
- Calibrated scene temperature from ADL-Full radiance are consistently lower than IDPS at all ATMS channels
- Major cause of the difference is due to the incorrect application of nonlinearity correction in IDPS

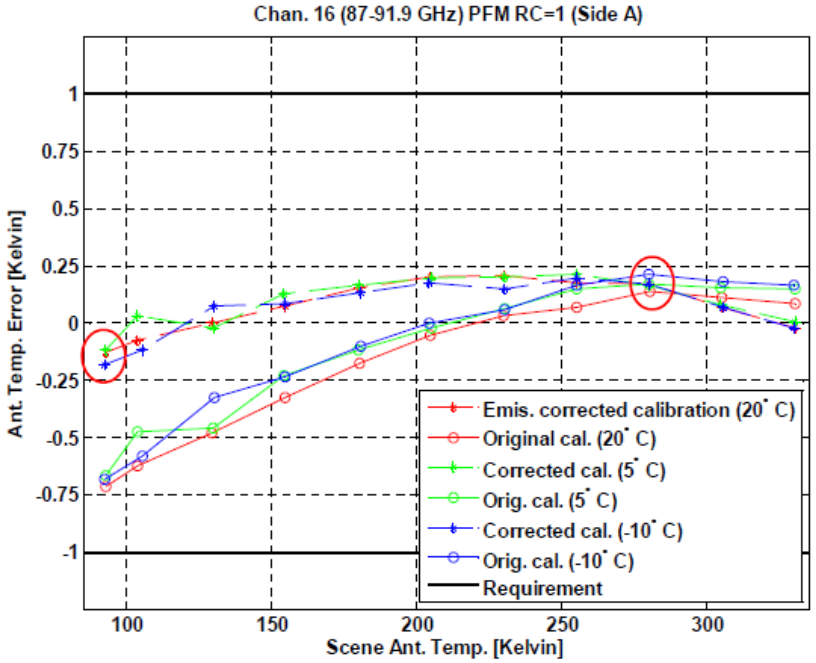


Hu (Tiger) Yang, *et. al.* (UMD/ESSIC)

S-NPP ATMS Reflector Emissivity Correction

Applying Correction to Calibration Testing

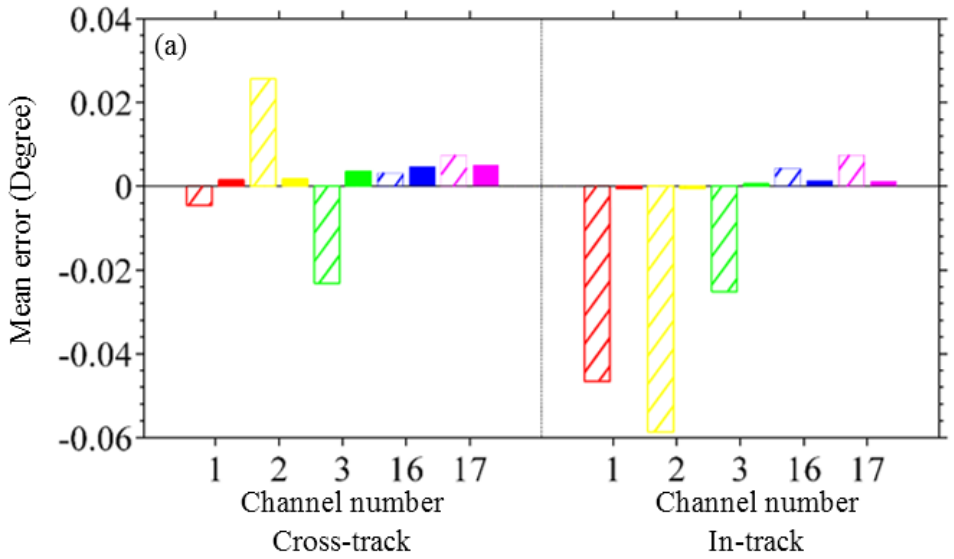


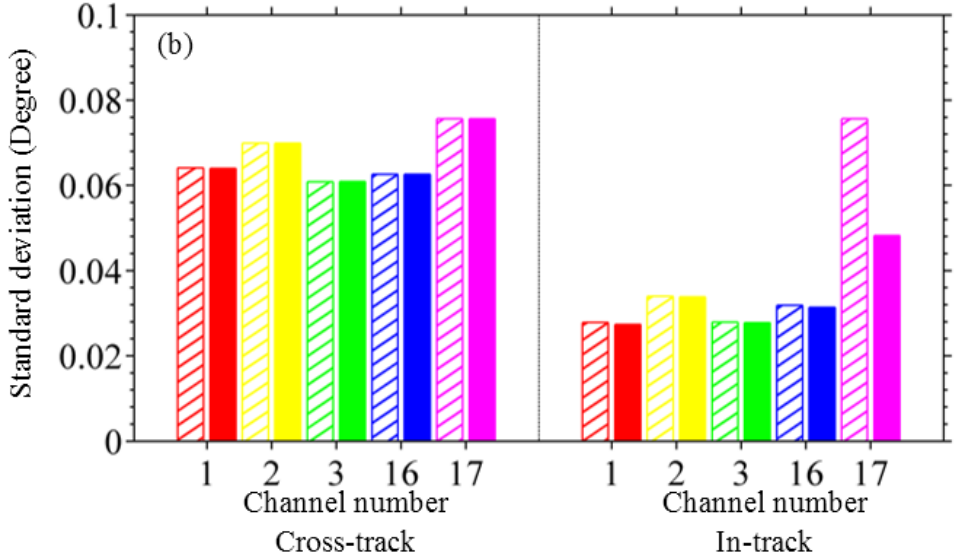


- The error of quasi-V channels moved close to zero at the two calibration points
- V-band quasi-H channels also moved closer to zero

Vince Leslie *et. al.* (MIT/LL)

S-NPP ATMS Geolocation Validation





	K	Ka	V	W	G
Roll	-0.0525	0.1645	-0.1967	-0.0103	0.0186
Pitch	0.3538	0.4388	0.1992	-0.0219	-0.0132
Yaw	-0.0938	-0.0594	-0.0524	0.0682	-0.0954

- S-NPP ATMS in-track and cross-track geolocation errors meet the requirement
- A rotation correction matrix is derived based on the analysis to improve the geolocation accuracy

Ninghai Sun, *et. al.* (STAR/ERT)

ATMS SDR Path Forward

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