



JPSS DPA Program Annual Review

SDR Team Accomplishment Highlights

- *Coordinated and worked closely with CalVal community*
- *Established a peer-reviewed process for NPP products*
- *All SDR products have reached or passed the beta version and SDR teams are planning for the provisional product review in October 2012*
- *Submitted more than 500 DRs and resolved many software processing bugs in IDPS*
- *Engaged in broader community through JPSS SDR/EDR presentations*
- *Enhanced operational capability through STAR ICVS LTM*s
- *Developed innovative calval sciences for JPSS program*
- *Published one paper in JGR and one in IEEE GRSL*
- *Planning for NPP CalVal Special Issue on IEEE TGRS*

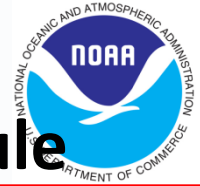


September 18, 2012





Summary of Suomi NPP TDR/SDR Algorithm Schedule



Sensor	Beta	Provisional (planned)	Validated (planned)
CrIS	May 7, 2012	December, 2012	2013
ATMS	February 22, 2012	December, 2012	2013
OMPS	March 12, 2012	December, 2013	2013
VIIRS	May 2, 2012	December, 2012	2013

NPP SDR Product Maturity Levels

1. Beta

- Early release product.
- Initial calibration applied.
- Minimally validated and may still contain significant errors (rapid changes can be expected. Version changes will not be identified as errors are corrected as on-orbit baseline is not established)
- Available to allow users to gain familiarity with data formats and parameters
- Product is not appropriate as the basis for quantitative scientific publications studies and applications

2. Provisional

- Product quality may not be optimal
- Incremental product improvements are still occurring as calibration parameters are adjusted with sensor on-orbit characterization (versions will be tracked)
- General research community is encouraged to participate in the QA and validation of the product, but need to be aware that product validation and QA are ongoing
- Users are urged to contact NPOESS NPP Cal/Val Team representatives prior to use of the data in publications

3. Validated/ Calibrated

- On-orbit sensor performance characterized and calibration parameters adjusted accordingly
- Ready for use by the Centrals and in scientific publications
- There may be later improved versions
- There will be strong versioning with documentation



JPSS DPA Program Annual Review

ICVS<M Team

September 18, 2012





Outlines



- STAR Team Membership
- FY-12 Accomplishments
- Scientific Advancements
- Issues, Challenges, Setbacks
- FY-13 Schedule and Milestone
- Path Forward (FY-14 thru FY-16)
- Summary



STAR Team Membership



- Science Lead
Fuzhong Weng

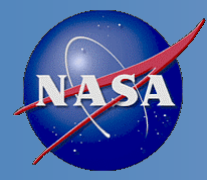
- System Lead
Ninghai Sun

- ATMS
Lin Lin

- CrIS
Xin Jin

- VIIRS
Tim Chang

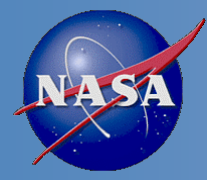
- OMPS
Mike Grotenhuis



FY-12 Accomplishments



- LTM system enhancements and New Capability:
 - Added NPP spacecraft data in ICVS-LTM
 - Routinely Monitored NPP Instrument Bias
 - Better OMPS
 - Corrected some bugs in NEDT calculations
 - Browsing VIIRS global image
- Delivered:
 - NPP Instrument Performance Monitoring Website (Trending, Bias, and Products)
 - NPP ATMS/CrIS Software Tools (readers, imaging processing, documents, etc.)



NOAA Instrument Long-Term Monitoring System



STAR Center for Satellite Applications and Research
formerly ORA — Office of Research and Applications



NOAA Satellite and Information Service
National Environmental Satellite, Data, and Information Service (NESDIS)

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Search STAR websites

Satellite Integrated Calibration / Validation System (ICVS)

» Integrated Cal/Val System

» NPP Instruments

» Instrument Performance Monitoring - Telemetry >>

- IPP S/C Telemetry
- **IPP ATMS >>**
- IPP CrIS
- IPP VIIRS
- IPP OMPS

- HOAA-19 AMSU-A
- HOAA-19 MHS
- HOAA-19 AVHRR
- HOAA-19 HIRS

- MetOP-A AMSU-A
- MetOP-A MHS
- MetOP-A AVHRR
- MetOP-A HIRS

- HOAA-18 AMSU-A
- HOAA-18 MHS
- HOAA-18 AVHRR
- HOAA-18 HIRS

- DMSP F16 SSMIS
- DMSP F17 SSMIS
- DMSP F18 SSMIS

- GOES-11 Sounder
- GOES-12 Sounder
- GOES-13 Sounder
- GOES-14 Sounder
- GOES-15 Sounder

» Instrument Performance Monitoring - Bias

» Products Demonstration

Data and images displayed on STAR sites are provided for experimental use only and are not official operational HOAA products. [More information>>](#)

ATMS Channel NEdT

All Channel Snapshot

ATMS Channel Gain

All Channel Snapshot

ATMS Cold Calibration Count

All Channel Snapshot

ATMS Warm Calibration Count

All Channel Snapshot

ATMS 4-Wire PRTs

K,Ka,V-Band Sensor

ATMS Receiver Shelf 2-Wire PRTs

K-Band

ATMS 2-Wire PRT (27 PRTs)

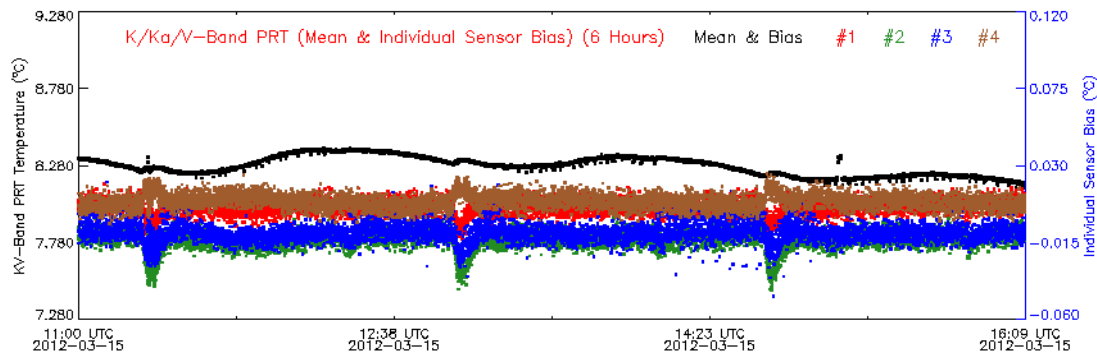
K-Band Receiver Front End Temperature

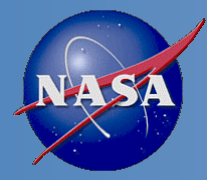
ATMS Health/Status Analog Parameters (35 Index)

Signal Processing Assembly +5V Secondary Voltage

NPP ATMS K, Ka, V-Band 4-Wire PRTs Science RDR

(Updated at Thu Mar 15 18:30:56 2012 UTC)





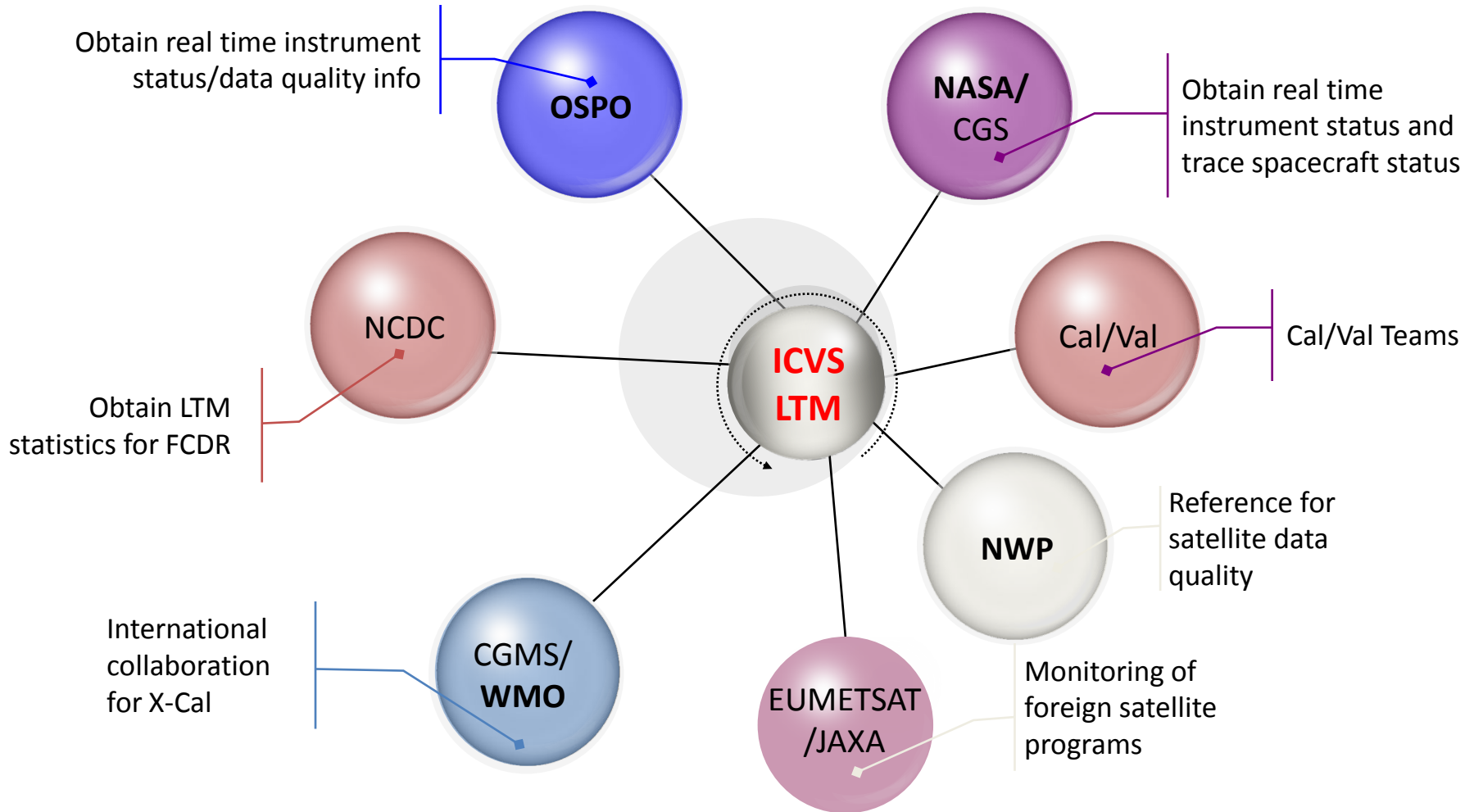
Major Benefits from Instruments LTM



- 1. Identify bugs and flaws in ground processing systems**
- 2. Characterize the instrument in-orbit performance (e.g. noise for NWP)**
- 3. Update the processing coefficient files (PCT) and lookup table (LUT)**
- 4. Detect instrument anomaly and provide the root-cause analysis**
- 5. Provide the alert and warning to user community on satellite data quality**

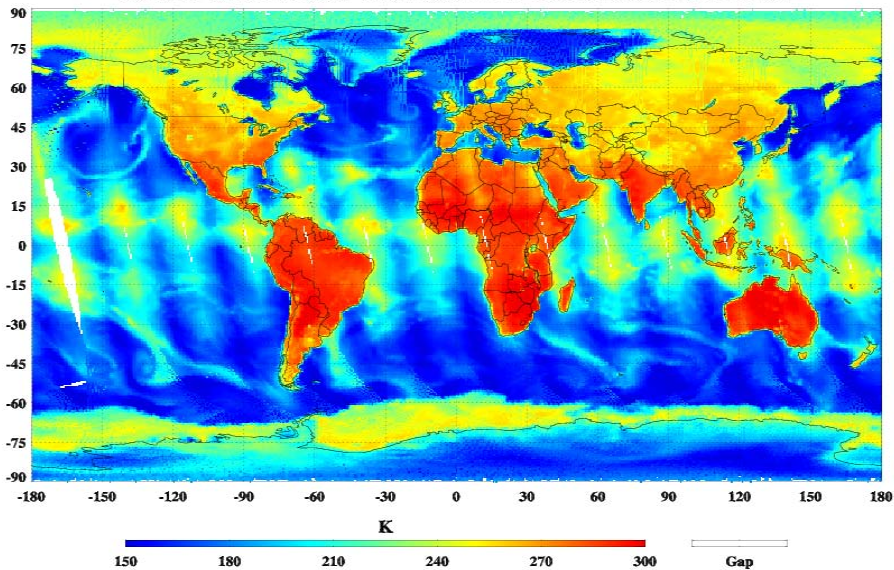


LTM Primary Users



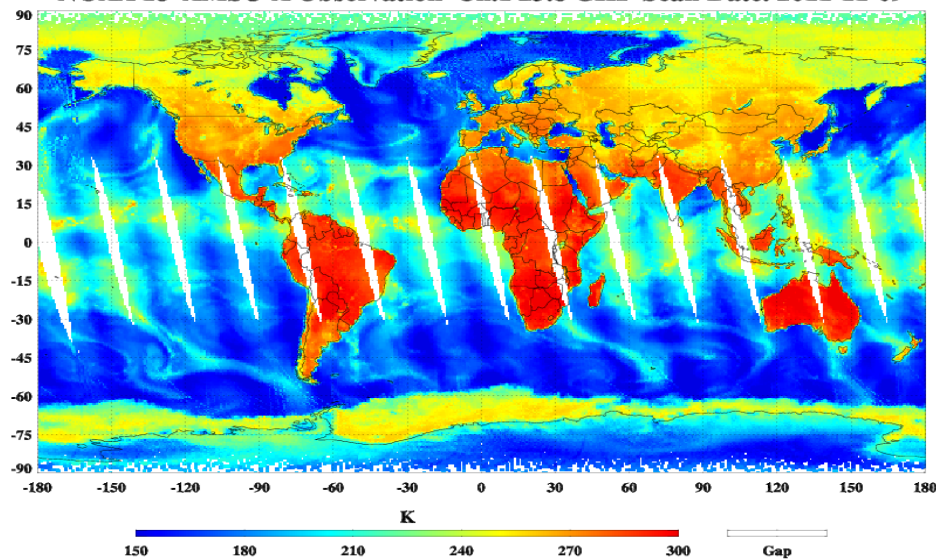
ATMS Observation Ch.1 Ascending

ATMS Observation Ch.1 23.8 GHz Scan Date: 2011-11-09



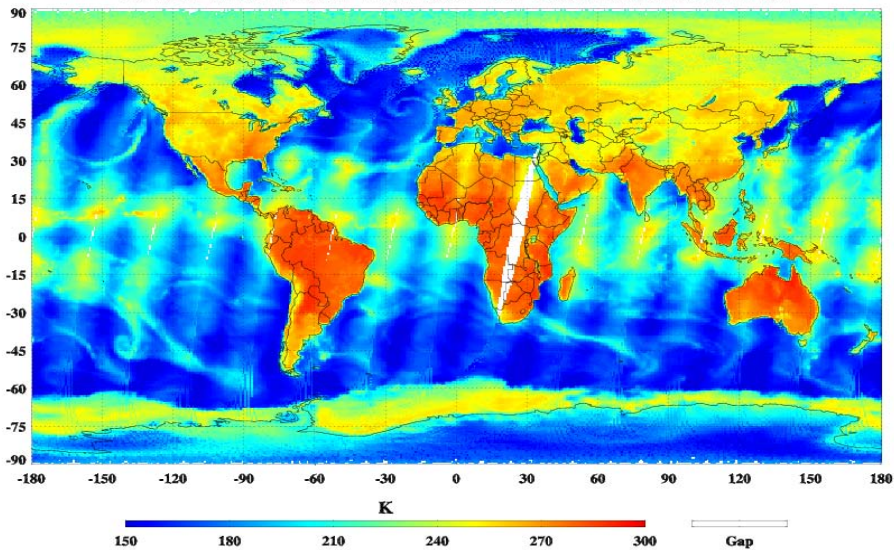
NOAA 18 AMSU-A Observation Ch.1 Ascending

NOAA 18 AMSU-A Observation Ch.1 23.8 GHz Scan Date: 2011-11-09



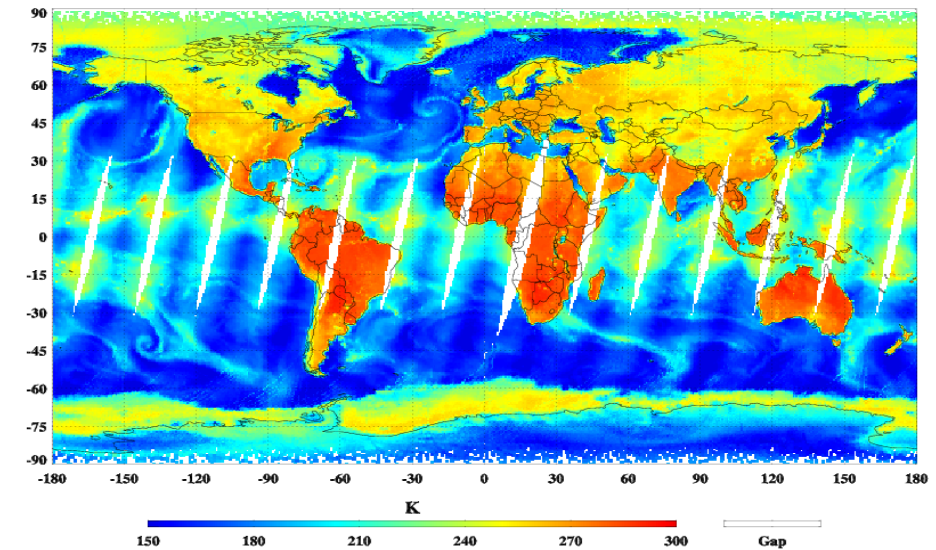
ATMS Observation Ch.1 Descending

ATMS Observation Ch.1 23.8 GHz Scan Date: 2011-11-09



NOAA 18 AMSU-A Observation Ch.1 Descending

NOAA 18 AMSU-A Observation Ch.1 23.8 GHz Scan Date: 2011-11-09

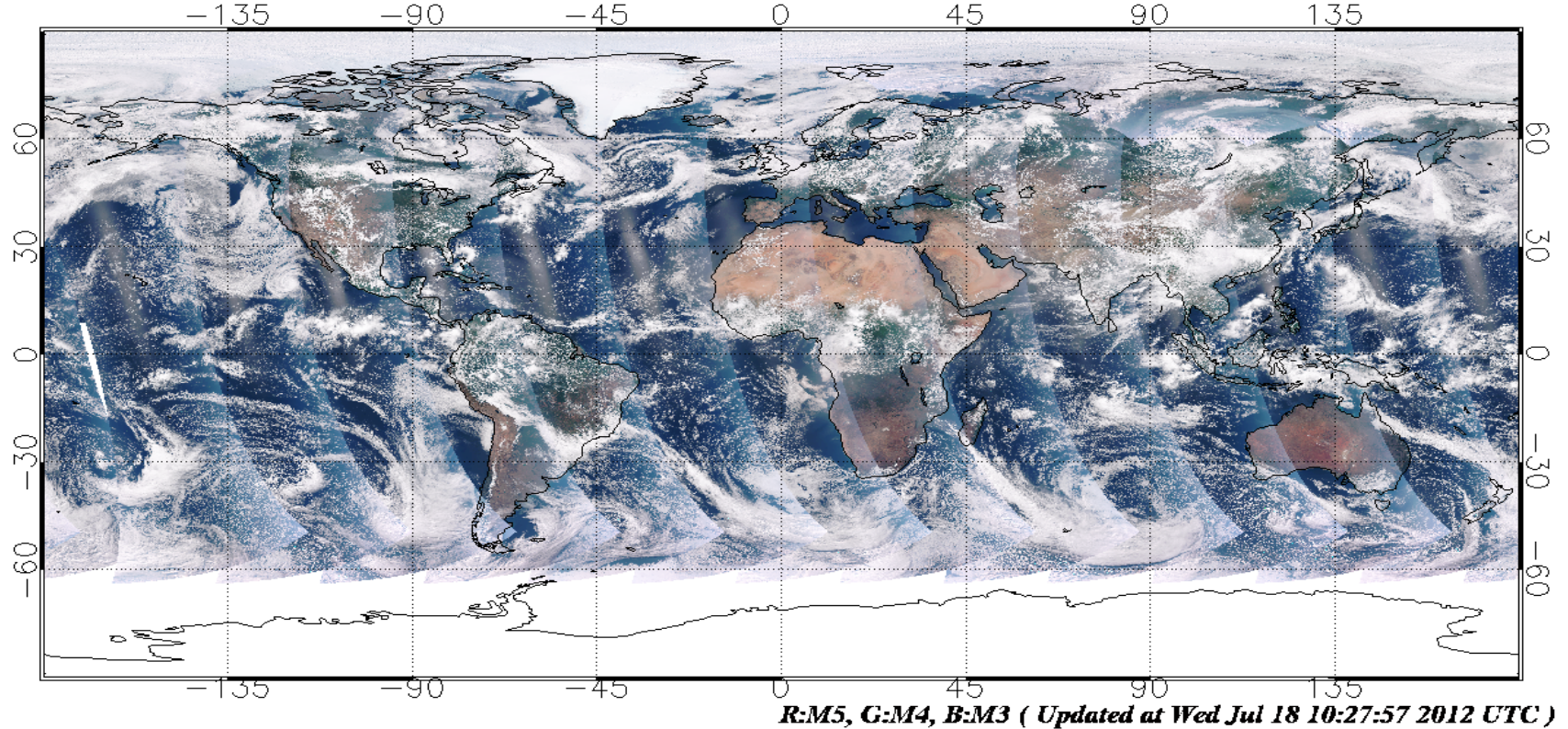


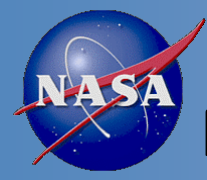


FY-12 Accomplishments (example: On-line Browsing of VIIRS RGB True Color)

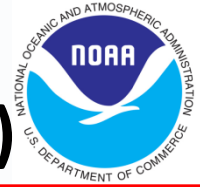


NPP_VIIRS_Global_TrueColor_Image_20120716

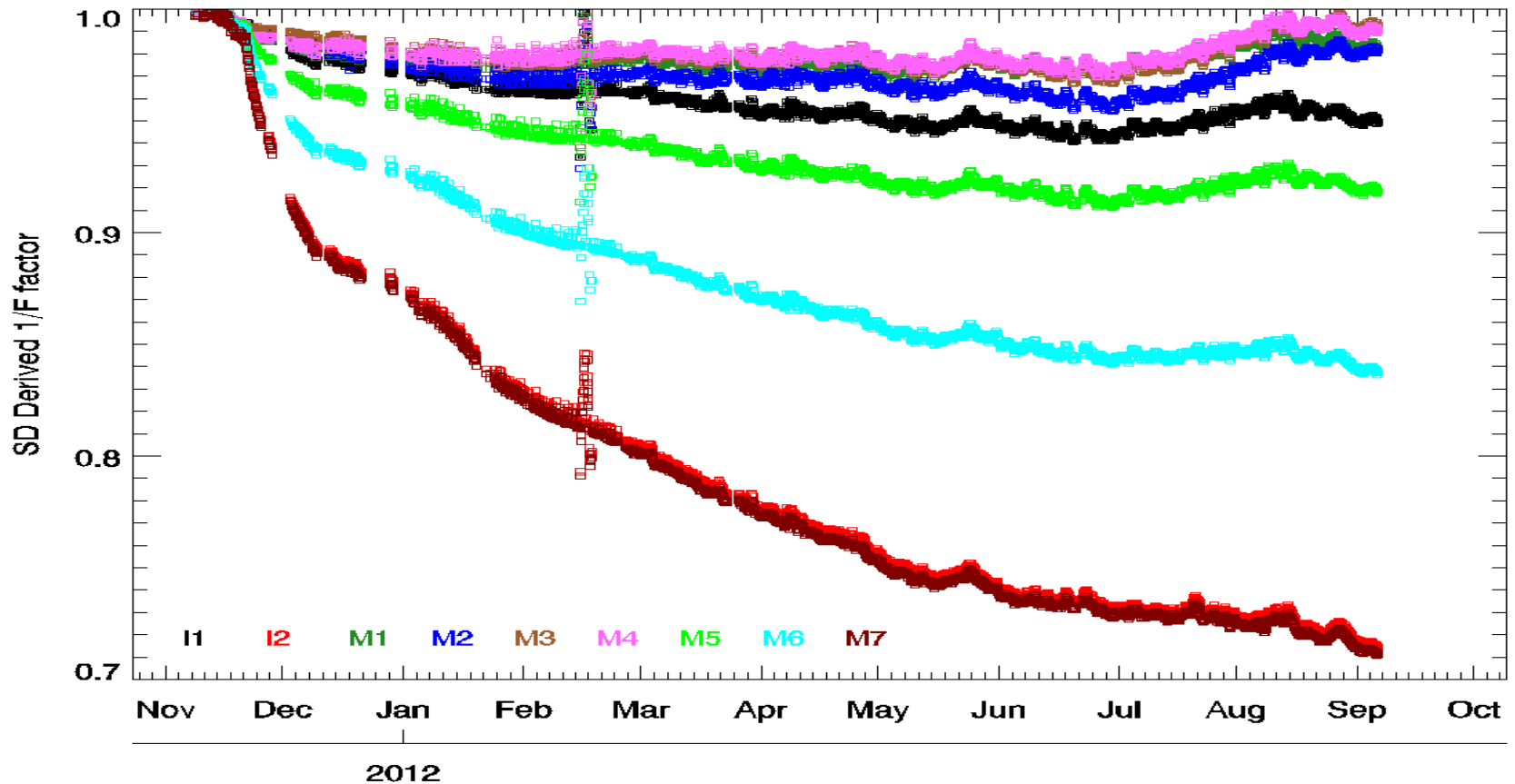




FY-12 Accomplishments (Example: Preliminary Online Trending of VIIRS F-/H-factors)



NPP/VIIRS Instrument Monitoring (Long Term)
SD_HighGain_Trend_F_Factor





NPP Data Collocation with COSMIC



- **Time period of data search:**

January, 2012

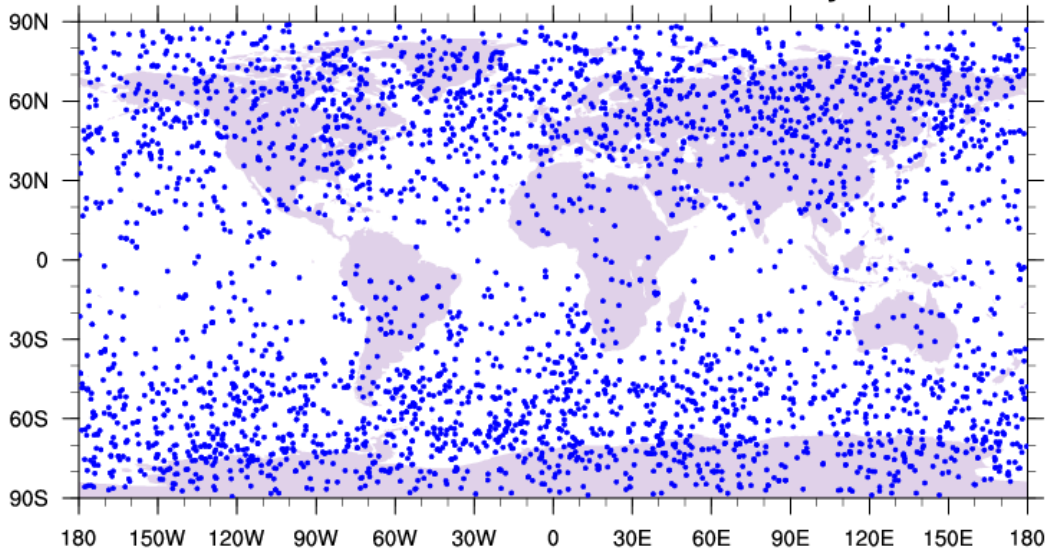
- **Collocation of CloudSat and COSMIC data:**

Time difference < 0.5 hour

Spatial distance < 30 km

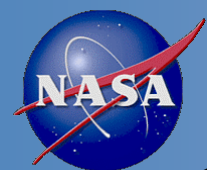
(GPS geolocation at 10km altitude is used for spatial collocation)

Distribution of collocated ATMS in January 2012

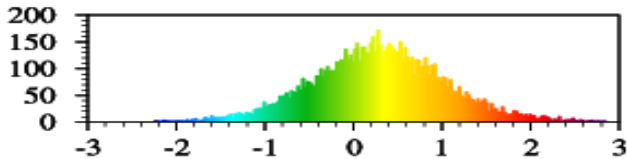
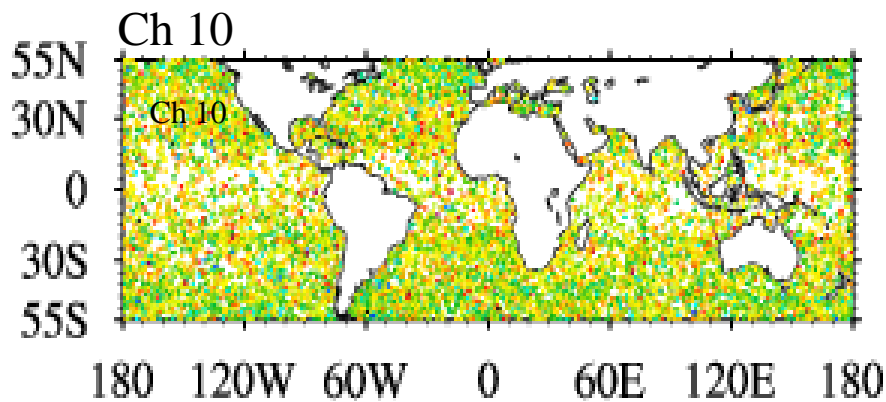
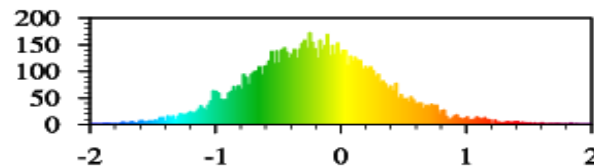
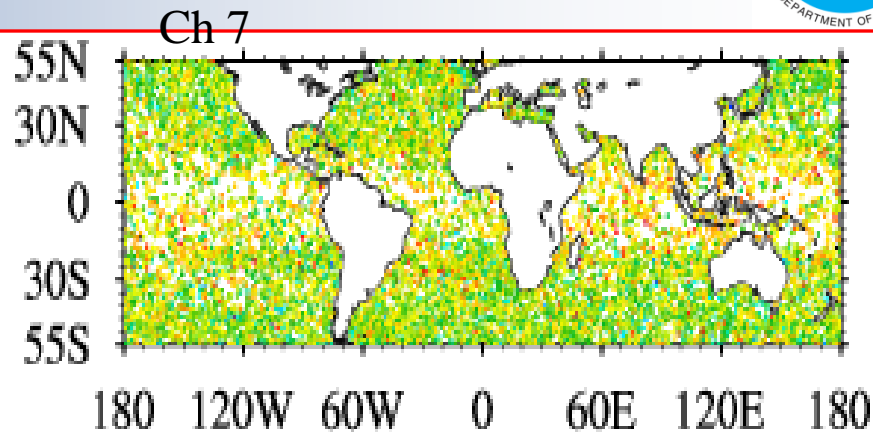
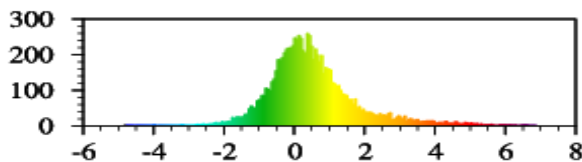
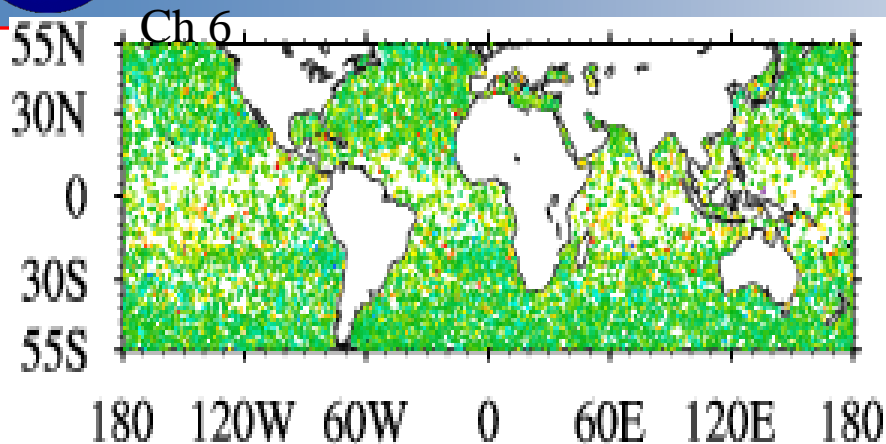


3056 collocated
measurements

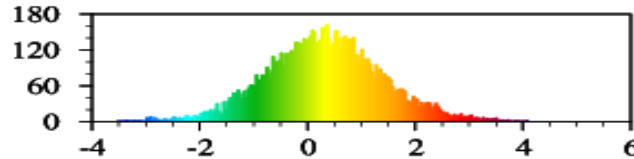
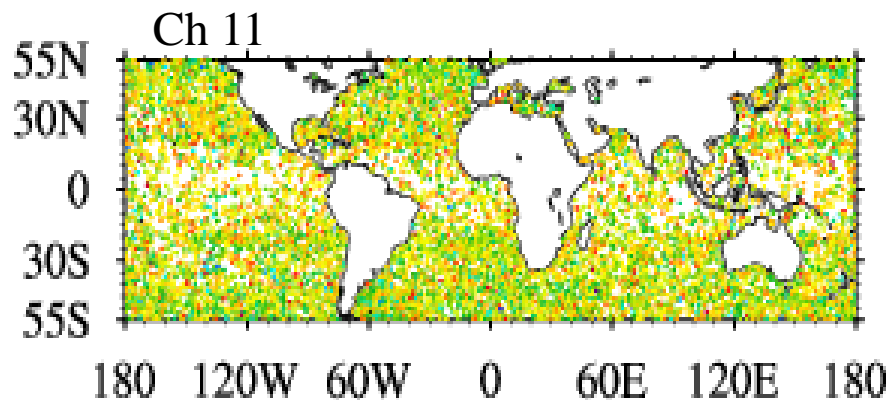
Courtesy of Lin Lin, STAR



ATMS Bias Obs (TDR) - GPS Simulated



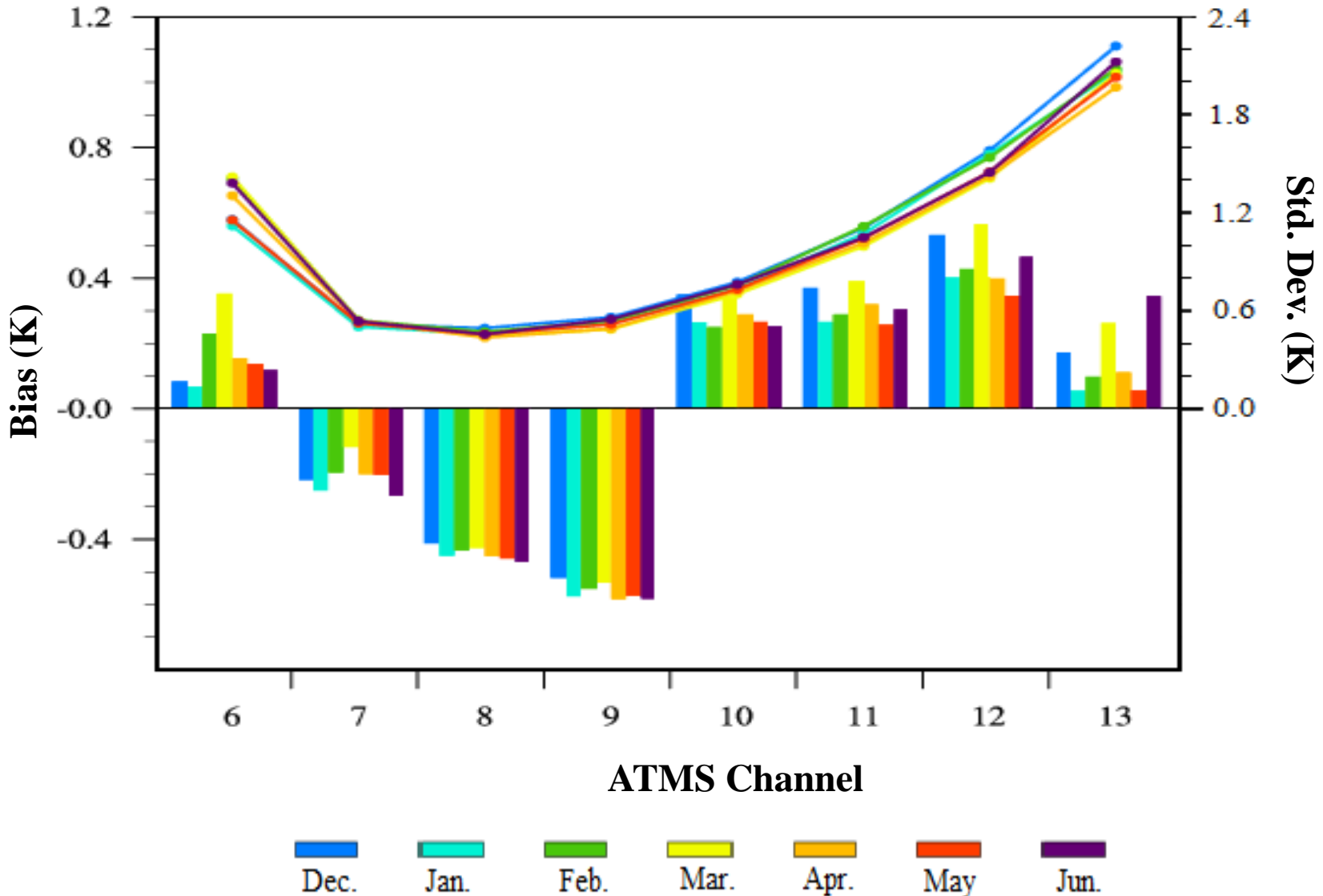
O-GPS (K)



O-GPS (K)



FY-12 Accomplishments (Example: Monitoring of ATMS Sounding Channels Bias)





Scientific Advancements



- Updated LBLRTM for CrIS and ATMS spectral calibrations with updated SRFs
- Updated the community radiative transfer model (CRTM) for VIIRS striping studies in RT channels
- Developed ATMS cloud liquid water algorithms for routine quality control of radiances biases



Issues, Challenges, Setbacks



- Increasing volumes of trending meta data files requires more storages
- Transition various monitoring tools from SDR team members in different platforms and software languages into STAR operational site



FY-13 Schedule and Milestones



- Improve ICVS/LTM performance
 - More spacecraft status monitoring
 - More instrument Status and Performance
 - Better data quality controls
 - Verification of LUT/PCT using ICVS
- Integrate multiple LTM packages to STAR ICVS
 - SDL CrIS radiometric monitoring package
 - NGAS ATMS/CrIS radiometric monitoring package



Path Forward (FY-14 thru FY-16)



- Improve user experience of current system for easy access and understanding
- Integrate latest instrument trending analysis of each SDR group into ICVS
- Improve the bias monitoring capability including more detailed analysis (e.g. biases wrt angular, scene, type)
- Prepare ICVS/LTM for J1 and J2 missions
- Provide periodical instrument performance analysis report to JPSS program and CGMS



Summary



- STAR LTM system is developed for NPP/JPSS Integrated Calibration/Validation
- Advanced SDR sciences and algorithms are transitioned into operations
- The updates for NPP LUT/PCT files and IDPS processing are automated
- The calval reports related to instrument anomalies are self-generated
- Users from broader community (e.g. NWP, forecasters) are now benefited greatly from STAR LTM system