



CrIS on JPSS-2,3,4: Summary of instrument, bus, integration, and test changes

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Overview

- **CrIS on JPSS-2,3,4 are intended to be copies of SNPP/J1 CrIS**
- **However, some minor changes could not be avoided, including:**
 - Vendor changes
 - Part changes due to obsolescence
 - Replacement of aging test equipment
- **Performance requirements have not changed**
 - A robust test program is in place to verify that changes will not impact performance



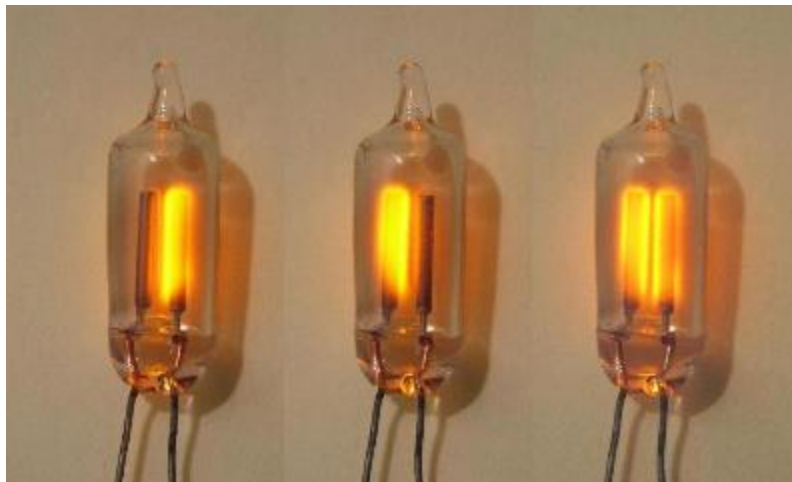
Instrument Changes

- **Part changes due to obsolescence include:**
 - Neon lamp
 - Metrology laser
 - More details on next slide
- **Vendor changes include:**
 - Beamsplitter coating
 - New vendor means new coating prescription but same performance requirements
 - Power supplies
 - Again, new vendor but same performance requirements
- **Changes to improve manufacturability include:**
 - Detector chip size increased to improve assembly yield
 - No change to active area diameter
 - Chamfer added to lens retainer to avoid contacting singlet
 - Corrective action following discovery of chip on J1 LW singlet

Neon lamp and Metrology laser

- **Neon lamp part obsolescence resulted in search for new supplier**
 - Testing established that new lamp meets glow stability and lifetime requirements

(Generic neon lamp image)



- **Metrology laser part obsolescence resulted in search for new supplier**
 - Testing established that new laser meets requirements for wavelength, beam quality, radiation tolerance, and mission assurance.



Instrument Test Changes

- **Bench test replaced by pre-environmental tvac test**
- **External calibration target (ECT) and control rack**
 - New ECT for reduced thermal gradients
 - Details on following slide
 - New rack for better heater control, more accurate temperature sensor readout, and improved reliability
 - NIST calibration scheduled for January 2017
- **Gas cart being rebuilt**
 - Will correct the gas pressure readout error discovered during J1 testing
- **Improvements to coregistration test setup**
 - More complete FOV mapping in less time
 - Enables early detection of obscurations or defects in detector assembly
- **EMI/EMC testing as well as vibration testing has been moved to Rochester facility**
 - Test equipment has also been consolidated in Rochester
 - Change in location only, not a test change



ECT and ST for Instrument TVAC

- **The Space Target (ST) will be unchanged from J1/SNPP**
- **Issues with current ECT:**
 - Brightness temperature gradients across the ECT aperture exceeding 150 mK were observed during J1 testing;
 - Gradient generally increased with heater power/setpoint temperature;
 - Difference between supplemental sensor temperature readings and brightness temperature also depended on heater power.
- **New ECT design:**
 - Preserves current cavity design and surface treatment;
 - Adds additional temperature sensors that are better integrated with primary plate;
 - Uses temperature-controlled fluid loop rather than LN2 radiative sink to reduce transition time and minimize heater power (and gradients) at each set point.
 - Gradients are predicted to be <10mK at all temperature setpoints.



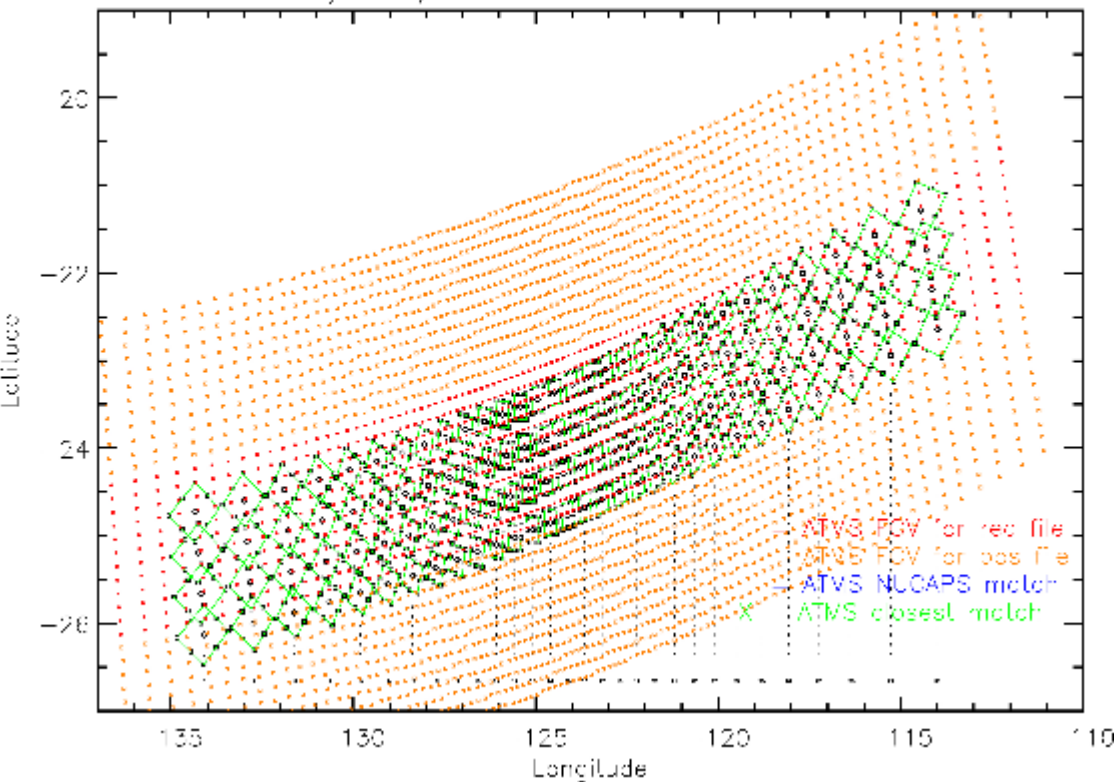
Satellite Bus and Integration Changes

- **The bus provider for JPSS-2,3,4 has changed from Ball Aerospace to Orbital ATK**
 - The spacecraft orientation during tvac testing will change from vertical (like at launch, as at Ball) to horizontal
 - The Earth target provider for spacecraft tvac testing will also change from Ball to Orbital ATK.
 - The space target will continue to be provided by Harris
 - Requirements for the targets are unchanged
- **The ATMS scan plane will be rotated slightly in yaw relative to CrIS to provide better alignment of the geolocated footprints**
 - Geolocated crosstrack scans are currently misaligned due to the combination of the different crosstrack scan rates and the satellite ground track velocity

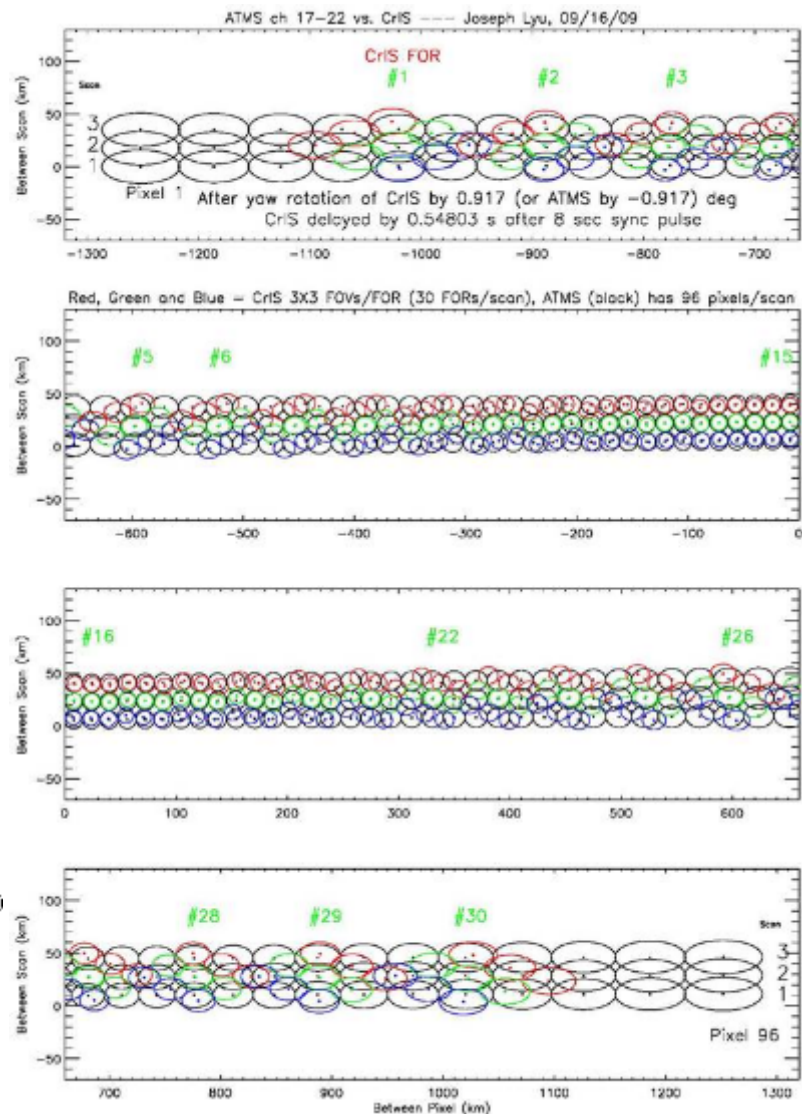


Current and Proposed ATMS/CrIS Alignment

/ndf5/GCRSD_pos_d20140217_t2



Current S-NPP (from Chris Barnet)



Proposed (from C-H Joseph Lyu)



J1/J2 STATUS UPDATE



JPSS-1 Test Update

- **As of 7/29, the spacecraft-level TVAC test schedule is:**
 - 8/8: Move spacecraft to TVAC chamber (with ATMS EDU unit)
 - 8/13: Start Open Door tests
 - 8/16: Close door and start TVAC
- **TVAC expected to last 50 days**
- **Tests include:**
 - Day-in-the-life testing
 - Jitter tests
 - Diagnostic mode data collection
 - Full spectral resolution diagnostic mode test
- **Two slides describing data access follow:**
 - One slides from Lisa McCormick
 - One from Leland Chemerys



Access to Test Data



- SMD data will be provided on GRAVITE for each instrument
 - Format
 - ATMS: RDR files, HDF5 wrapped CCSDS packets (.h5)
 - CERES: RDR files, HDF5 wrapped CCSDS packets (.h5)
 - CrIS: RDR files, HDF5 wrapped CCSDS packets (.h5)
 - OMPS: RDR files, HDF5 wrapped CCSDS packets (.h5)
 - VIIRS:
 - All test data: raw CCSDS format (.dat)
 - Full Swath Test data: RDR files, HDF5 wrapped CCSDS packets (.h5)
 - Frequency of data arrival
 - End of every shift (time of day not yet known)
 - BATC plans 3 shifts per 24hrs, 7days a week
- Ancillary Data (targets, event logs, etc.) provided on eRooms
 - [My eRooms](#) > [Flight Integration and Test](#) > [JPSS-1 I&T](#) > Satellite Test Ancillary Data
 - Access is Need-to-Know. BATC NDA is not required.



Processing Flow



- BATC pushes all raw SMD and HRD data to the NASA server
- The SMD files will be processed for the science team using the DRL Satellite Telemetry Processing System (STPS) software
 - DRL is the Direct Readout Lab in GSFC building 28
- Arrival of new data triggers processing of each SMD file with the STPS software
 - STPS can generate either HDF-formatted RDRs or raw CCSDS packet files for each instrument
 - An STPS config file controls the output formats
 - An iteration may be required to generate a config file that satisfies each instrument science team
 - This task is complicated a bit by non-flight APID mappings during the ground testing.



JPSS-2 CrIS Status Update

- **Subcontractors working on major subassemblies, including:**
 - Optomechanical assembly (interferometer)
 - Telescope
 - Detectors
 - Electronic Circuit Card Assemblies
- **Major project milestone dates:**
 - 7/18/2017: Pre-environmental TVAC
 - Replaced the bench test on NPP/J1
 - 4/1/2018: Full TVAC performance testing
 - 5/3/2018: Pre-ship review