Suomi NPP/JPSS Cross-track Infrared Sounder (CrIS): Calibration Validation With The Aircraft Based Scanning High-resolution Interferometer Sounder (S-HIS)


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Example of Preliminary Calibration Verification Results

**CrIS Brightness Temperature Spectra and RU**

**S-HIS Brightness Temperature Spectra and RU**

Pre-flight conditions encountered over the SNAP campaign on 2015-03-29

**CrIS Brightness Temperature Spectra and RU**

**S-HIS Brightness Temperature Spectra and RU**

Pre-flight conditions encountered over the SNAP campaign on 2015-03-29

**S-HIS Calibration Verification, Nominal Processing; T**

**2015-03-29 (VIIRS SVI05 BT)**

**HIS Calibration Verification, Nominal Processing; T**

**2015-03-23 (VIIRS SVI05 BT)**

**2015-03-24 (VIIRS SVI05 BT)**

**2015-03-28 Overpass #1 (VIIRS SVI05 BT)**

**2015-02-23**

**MODIS/ASTER airborne simulator (MASTER).**

**NPOESS Clouds and Radiation Testbed-Microwave Spectrometer (NLP-M), and the NASA Scanning High-resolution Interferometer Sounder (S-HIS), the NPOESS Atmospheric Sounder Testbed-Interferometer (NAST-I), and the NASA ER-2 payload consisted of the Suomi NPP/JPSS Cross-track Infrared Sounder (CrIS):**

**Summary**

**CrIS**

- Infrared Fourier transform spectrometer with 1305 spectral channels, produces high-resolution, three-dimensional temperature, pressure, and moisture profiles. Designed to give scientists more refined information about Earth’s atmosphere and improve weather forecasts and our understanding of climate.

- **CrIS Sensor Features**
  - 48.33˚ Steps
  - 1305 spectral channels
  - Resolution: 4 cm⁻¹
  - Temperature: 200-320K
  - Spectral coverage: 500-4000 cm⁻¹
  - FOV: 45°
  - Airborne under flight conditions
  - AERI BB (Ambient Blackbody)

- **FOV Selection for CrIS**
  - 2015-03-29
  - CrIS FOV
  - Mean BT: 869.9 – 951.9 cm⁻¹
  - S-HIS FOV
  - Mean BT: 806.6 – 952.2 cm⁻¹
  - VIIRS SVI05 BT within selected CrIS FOV

- **S-HIS**
  - **Calibration, Calibration Verification, and Traceability**
    - Pre-integration calibration of on-board blackbody references at subsystem level
    - Pre and post deployment end-to-end calibration verification
    - Periodic end-to-end radiance evaluations under flight like conditions with NIST transfer sensors.
    - Instrument calibration during flight using two on-board calibration blackbodies

- **CrIS Field of Regard (FOR)**
  - **Internal spectral calibration**
  - **Plane mirror interferometer with DA**
  - **4-stage passive cooler**
  - Produces high-resolution, 600 cm⁻¹ spectral resolution

- **Preliminary LTR Comparisons for 2015-03-29 Flight:**
  - It’s double the number of cal, does not account for view angle or altitude differences, data plotted at native spectral resolutions.