Cold Scene Calibration Validation Of The Cross-track Infrared Sounder (CrIS) With The Aircraft Based Scanning High-resolution Interferometer Sounder (S-HIS)

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Introduction

- Infrared fourier transform spectrometer that 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

- Data acquired for external blackbody temperatures of ambient, 318K, 333K, and Ice Bath blackbody.
- Data acquired for internal blackbody temperatures of ambient, 226K, 296K, and Ice Bath blackbody.

S-HIS

- 4-stage passive cooler
- 1 FOV = 3 IR Bands
- Atmospheric emission/absorption not included
- Instrument calibration during flight using two on-board calibration blackbodies

Reframed FOV Selection for CrIS (2015-03-29 Example)

- For non-repeat cloudy frames FOV selection becomes very important
- (i) Temporal variability
- (ii) Inadequate coverage of the satellite footprint for high clouds
- Useful to use cloud free images for scene quality assessment

Analysis and Results

Preliminary LW Comparisons for 2015-03-29 Flight

Collected VIS/IR data can be used to evaluate temporal change from satellite to aircraft observation.

Double-Offs - Calc (DOMC)

Collected VIS/IR data can be used to evaluate temporal change from satellite to aircraft observation.

Summary Obs - Obs BT Diff Native Spectral Resolutions

Results are very encouraging showing campaign (DOMC) comparisons can be less than those SNO-derived comparisons already published.

(1) Derived [S-HIS BT-LWIR] calculations
(2) DOMC comparisons for IASI-A, -B, and -C cases