

# IASI L0 and L1 Weekly Monitoring Report Metop-A

IASI monitoring team

16/09/2019 00:00:00 - 23/09/2019 00:00:00 (Week 38 )

## 1 Introduction

This report provides summary monitoring plots and figures from IASI instrument on the MetOp-A satellite retrieved from the IASI L0 and L1 ENG product (3 minute data packet) for 16/09/2019 00:00:00 - 23/09/2019 00:00:00 .

The monitoring data are extracted on PDU basis.

Data extraction, calibration, processing and statistics are performed at EUMETSAT.

## 2 Data quantity 16/09/2019 00:00:00 - 23/09/2019 00:00:00

| Product Type                         | Number | Action |
|--------------------------------------|--------|--------|
| L0 HKTM PDUs                         | 3361   | -      |
| L0 IASI PDUs                         | 3361   | -      |
| L1 ENG PDUs                          | 3360   | -      |
| L1 ENG distinct GEPSGranule          | 3358   | -      |
| L1 DPX PDUs (RM: IASI-HIRS)          | 228    | e      |
| L1 DPS Files (RM: OBS-CAL NWP based) | 3360   | -      |

Table 1: Data quantity

| APID | Packet type | Packets lost |
|------|-------------|--------------|
| -    | -           | -            |

Table 2: L0 packet losses

### 3 Instrument modes

| Time                | Transition from            | Transition to              |
|---------------------|----------------------------|----------------------------|
| 16/09/2019 00:00:02 | -                          | Normal operation           |
| 17/09/2019 18:32:50 | Normal operation           | Auxiliary ASE synchronised |
| 17/09/2019 18:34:58 | Auxiliary ASE synchronised | External calibration       |
| 17/09/2019 18:54:58 | External calibration       | Auxiliary ASE synchronised |
| 17/09/2019 18:57:06 | Auxiliary ASE synchronised | Normal operation           |
| 17/09/2019 20:13:38 | Normal operation           | Auxiliary ASE synchronised |
| 17/09/2019 20:15:46 | Auxiliary ASE synchronised | External calibration       |
| 17/09/2019 20:39:14 | External calibration       | Auxiliary ASE synchronised |
| 17/09/2019 20:41:22 | Auxiliary ASE synchronised | Normal operation           |
| 17/09/2019 21:54:26 | Normal operation           | Auxiliary ASE synchronised |
| 17/09/2019 21:56:18 | Auxiliary ASE synchronised | External calibration       |
| 17/09/2019 22:25:22 | External calibration       | Auxiliary ASE synchronised |
| 17/09/2019 22:27:30 | Auxiliary ASE synchronised | Normal operation           |
| 17/09/2019 23:34:58 | Normal operation           | Auxiliary ASE synchronised |
| 17/09/2019 23:36:50 | Auxiliary ASE synchronised | External calibration       |
| 18/09/2019 00:07:14 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 00:09:06 | Auxiliary ASE synchronised | Normal operation           |
| 18/09/2019 01:15:14 | Normal operation           | Auxiliary ASE synchronised |
| 18/09/2019 01:17:22 | Auxiliary ASE synchronised | External calibration       |
| 18/09/2019 01:48:50 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 01:50:58 | Auxiliary ASE synchronised | Normal operation           |
| 18/09/2019 04:44:18 | Normal operation           | Auxiliary ASE synchronised |
| 18/09/2019 04:46:10 | Auxiliary ASE synchronised | External calibration       |
| 18/09/2019 05:13:06 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 05:15:14 | Auxiliary ASE synchronised | Normal operation           |
| 18/09/2019 06:56:02 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 06:57:54 | Auxiliary ASE synchronised | Normal operation           |
| 18/09/2019 09:06:26 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 09:08:18 | Auxiliary ASE synchronised | Normal operation           |
| 18/09/2019 10:05:38 | Auxiliary ASE synchronised | External calibration       |
| 18/09/2019 10:52:18 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 10:54:26 | Auxiliary ASE synchronised | Normal operation           |
| 18/09/2019 11:48:50 | Normal operation           | Auxiliary ASE synchronised |
| 18/09/2019 11:50:42 | Auxiliary ASE synchronised | External calibration       |
| 18/09/2019 12:39:14 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 12:41:22 | Auxiliary ASE synchronised | Normal operation           |
| 18/09/2019 13:32:34 | Normal operation           | Auxiliary ASE synchronised |
| 18/09/2019 13:34:26 | Auxiliary ASE synchronised | External calibration       |
| 18/09/2019 14:25:54 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 14:28:02 | Auxiliary ASE synchronised | Normal operation           |
| 18/09/2019 15:15:14 | Normal operation           | Auxiliary ASE synchronised |
| 18/09/2019 15:17:22 | Auxiliary ASE synchronised | External calibration       |
| 18/09/2019 16:11:30 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 16:13:38 | Auxiliary ASE synchronised | Normal operation           |
| 18/09/2019 16:57:38 | Normal operation           | Auxiliary ASE synchronised |
| 18/09/2019 16:59:30 | Auxiliary ASE synchronised | External calibration       |
| 18/09/2019 17:56:02 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 17:58:10 | Auxiliary ASE synchronised | Normal operation           |
| 18/09/2019 19:01:22 | Normal operation           | Auxiliary ASE synchronised |
| 18/09/2019 19:03:30 | Auxiliary ASE synchronised | External calibration       |
| 18/09/2019 19:40:02 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 19:41:54 | Auxiliary ASE synchronised | Normal operation           |
| 18/09/2019 20:44:34 | Normal operation           | Auxiliary ASE synchronised |

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Table 3 – continued from previous page

| Time                | Transition from            | Transition to              |
|---------------------|----------------------------|----------------------------|
| 18/09/2019 20:46:26 | Auxiliary ASE synchronised | External calibration       |
| 18/09/2019 21:23:14 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 22:31:14 | Normal operation           | Auxiliary ASE synchronised |
| 18/09/2019 22:33:22 | Auxiliary ASE synchronised | External calibration       |
| 18/09/2019 23:02:42 | External calibration       | Auxiliary ASE synchronised |
| 18/09/2019 23:04:34 | Auxiliary ASE synchronised | Normal operation           |
| 19/09/2019 00:16:18 | Normal operation           | Auxiliary ASE synchronised |
| 19/09/2019 00:18:10 | Auxiliary ASE synchronised | External calibration       |
| 19/09/2019 00:42:26 | External calibration       | Auxiliary ASE synchronised |
| 19/09/2019 00:44:34 | Auxiliary ASE synchronised | Normal operation           |
| 19/09/2019 02:00:02 | Normal operation           | Auxiliary ASE synchronised |
| 19/09/2019 02:02:10 | Auxiliary ASE synchronised | External calibration       |

Table 3: Instrument modes

## 4 L0 and L1 Data Quality

| Day        | L0 quality | L1 quality | L0 PDUs | L1 PDUs |
|------------|------------|------------|---------|---------|
| 16/09/2019 | 99.49 %    | 99.48 %    | 480     | 480     |
| 17/09/2019 | 99.34 %    | 99.19 %    | 480     | 480     |
| 18/09/2019 | 98.18 %    | 97.25 %    | 480     | 480     |
| 19/09/2019 | 99.48 %    | 99.41 %    | 480     | 480     |
| 20/09/2019 | 99.39 %    | 99.38 %    | 480     | 480     |
| 21/09/2019 | 99.49 %    | 99.48 %    | 480     | 480     |
| 22/09/2019 | 99.48 %    | 99.48 %    | 480     | 480     |

Table 4: Quality overview

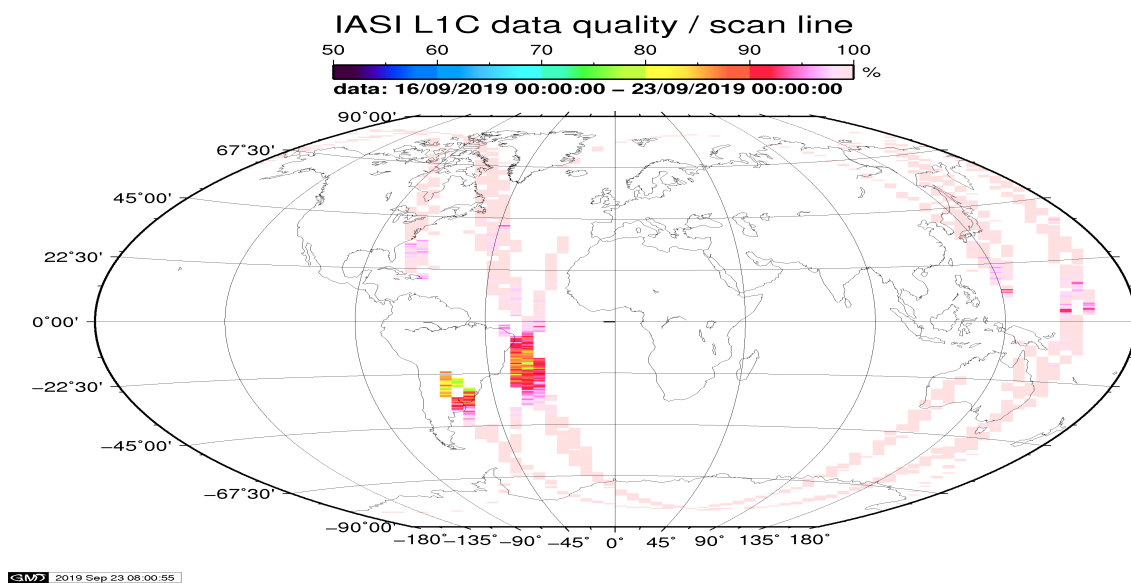


Figure 1: L1C data quality

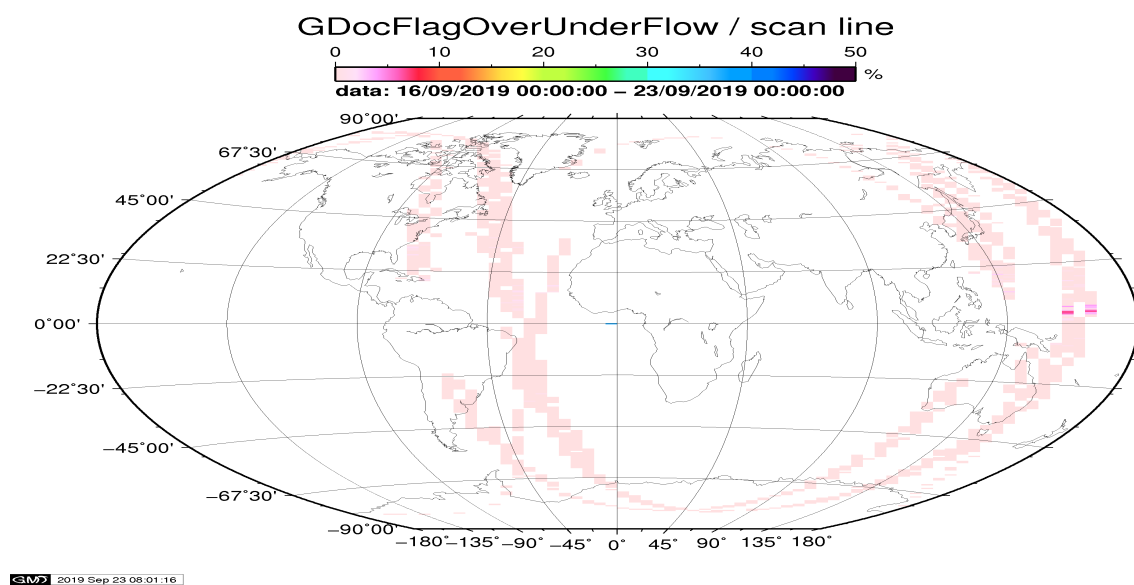


Figure 2: Flag of Over and Under Flows

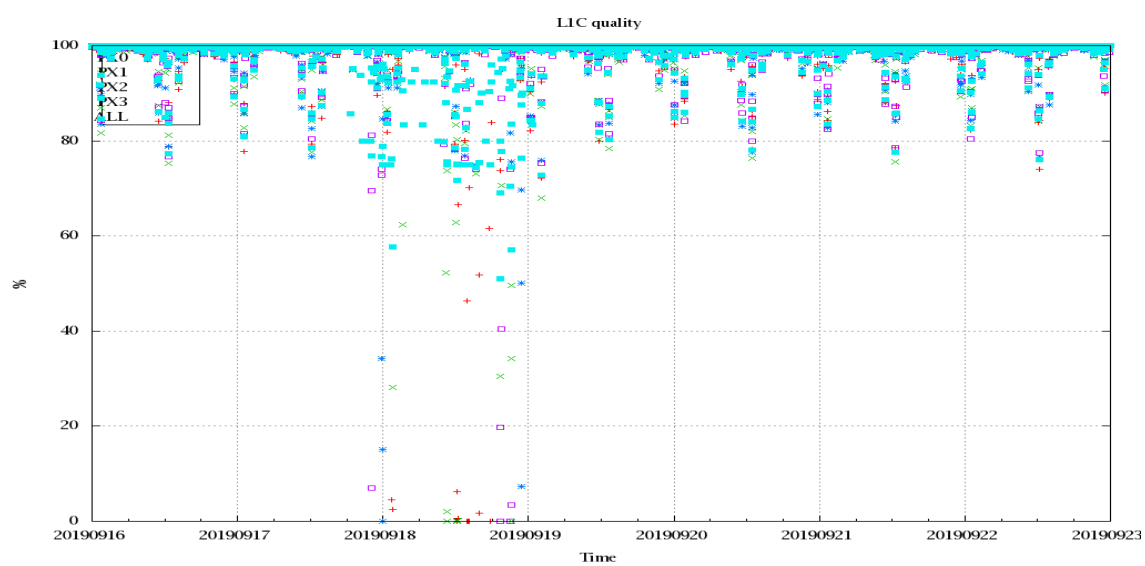


Figure 3: Level 1C quality

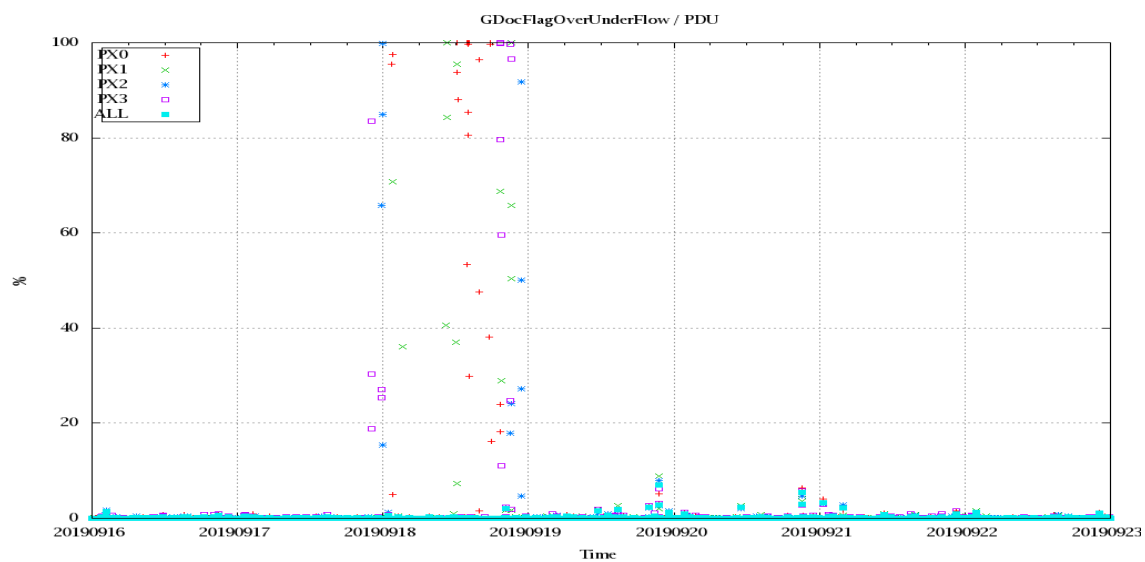


Figure 4: OverUnderFlowFlag timeseries

## 5 Radiance monitoring based on NWP

The radiance monitoring compares the IASI measurements (L1C-eps-products) obtained under clear sky situation over sea with modeled radiances. Cloud identification is based on cloud flag of co-located AVHRR L1B data in addition to information from the IASI L1C clustering analysis here only homogenous situations are taken into account (99.0 percent in first class). A radiative transfer model (RTM) is feed with co-located ECMWF profiles of T,WV, and Ozon. Between March 2007 and the 18th of May 2010 RTIASI in Version 4.0 is used. After the 18th of May 2010 the RTTOV model in V9.3 is used. Information about the SST is obtained from the AVHRR L1B or taken from AVHRR scenes analysis (CGS only).

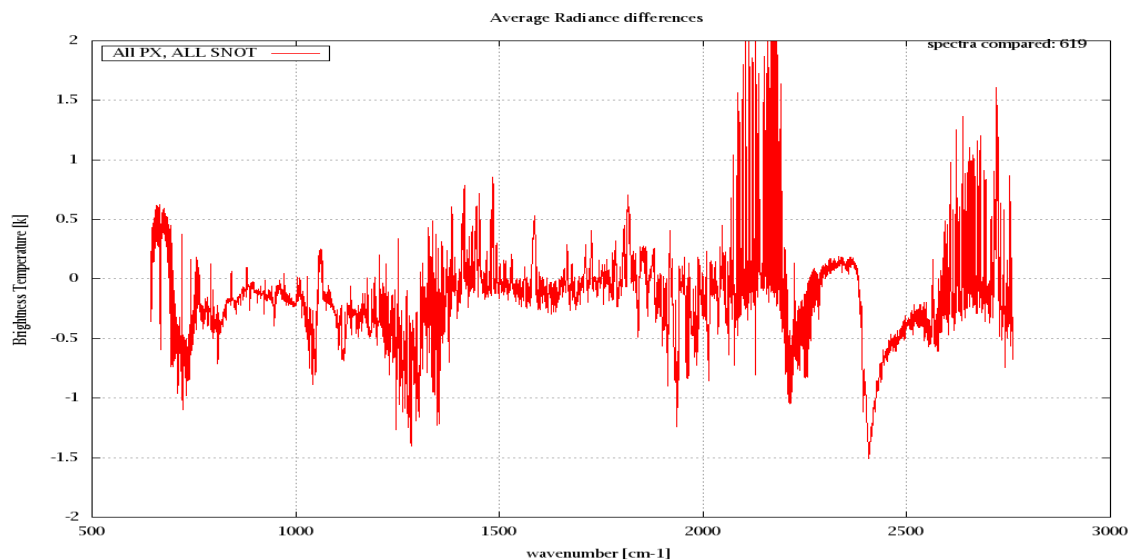


Figure 5: Average radiance differences: OBS-CAL

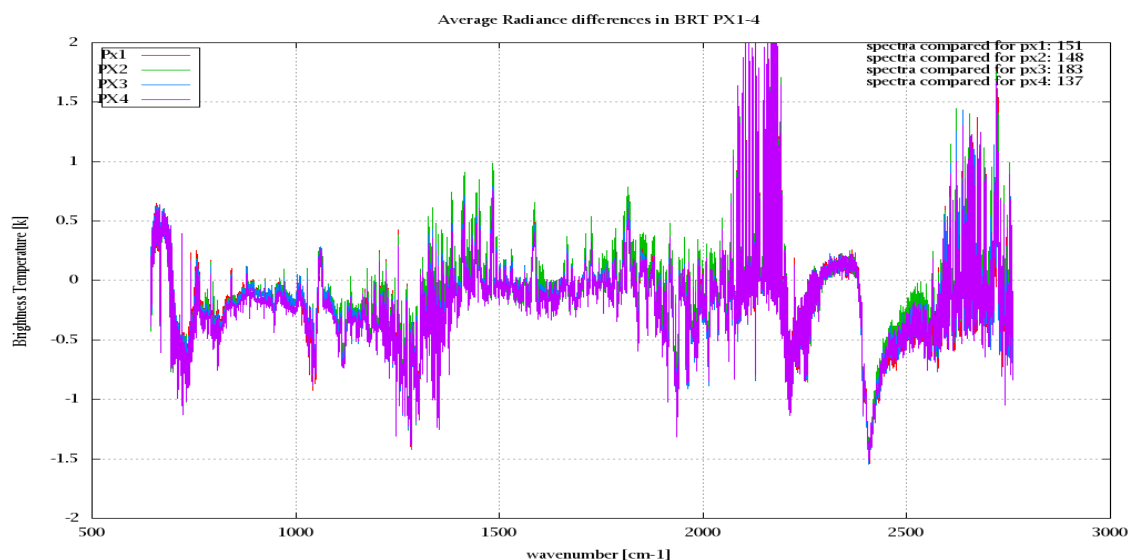


Figure 6: Average radiance differences: OBS-CAL

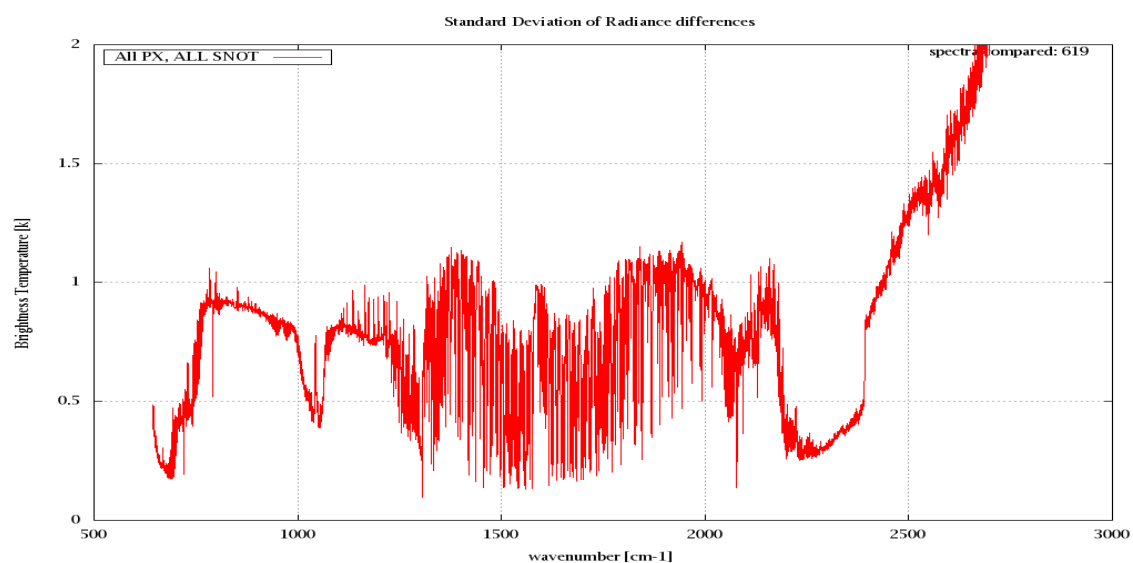


Figure 7: Standard deviation of radiance differences

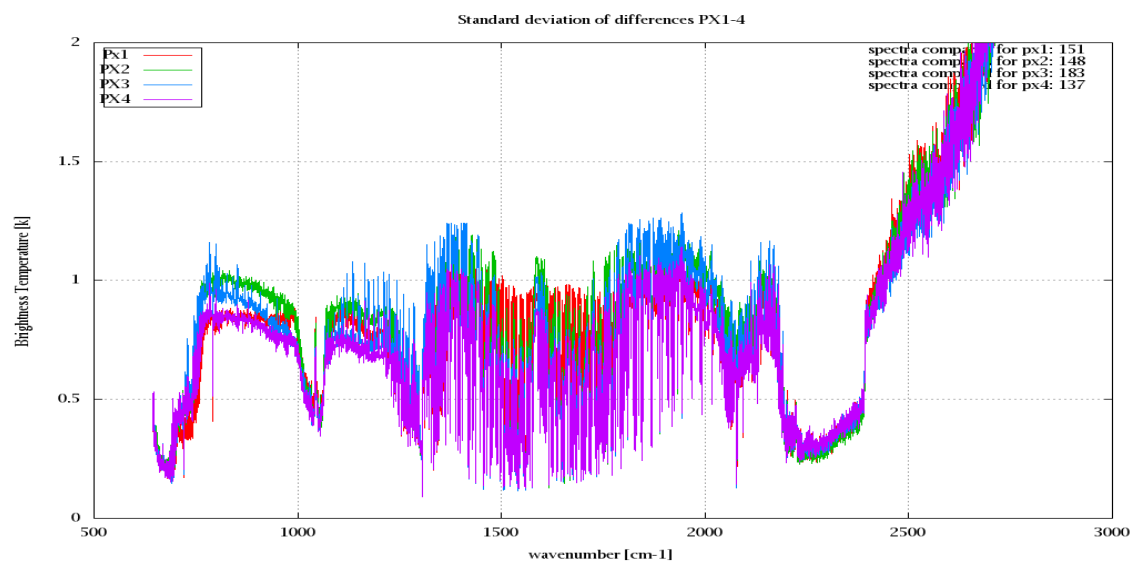


Figure 8: Standard deviation of radiance differences per pixel

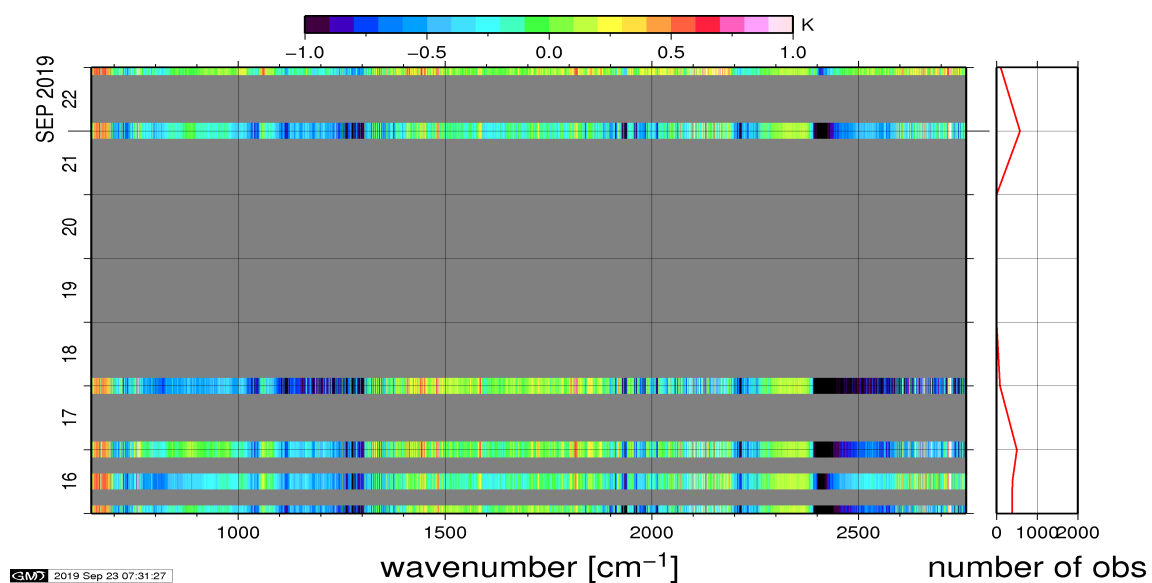


Figure 9: Radiance bias in BRT: All Channels

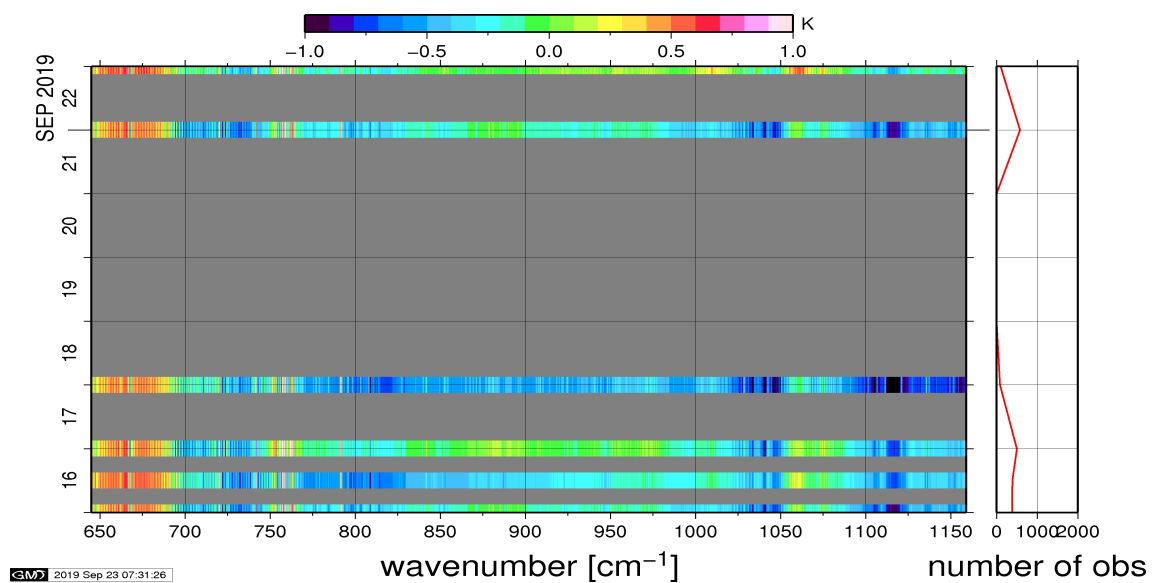


Figure 10: Radiance bias in BRT: IASI Band 1



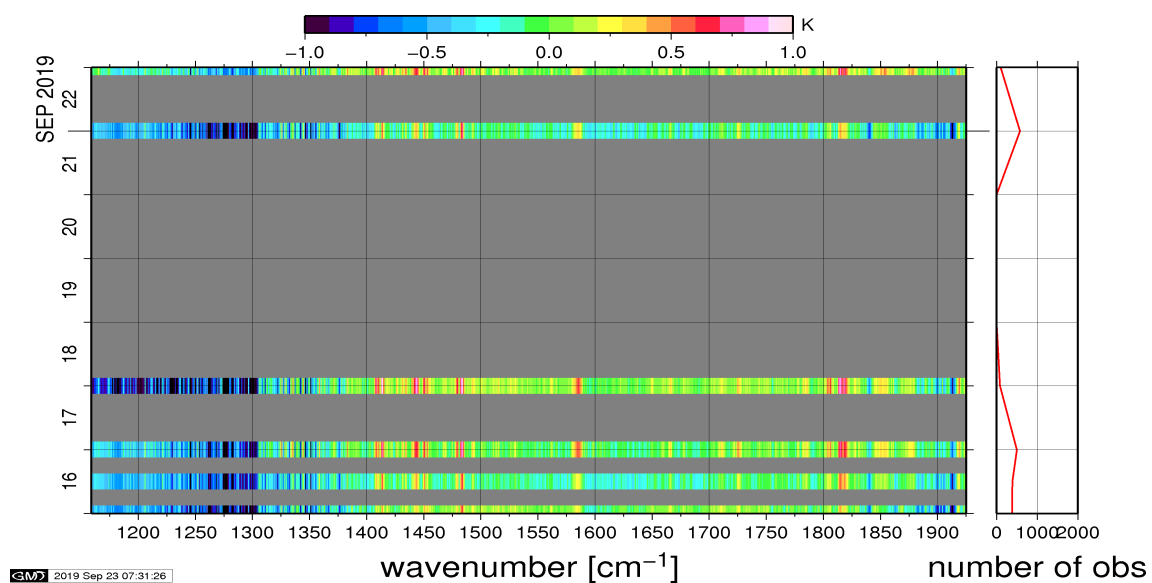


Figure 11: Radiance bias in BRT: IASI Band 2

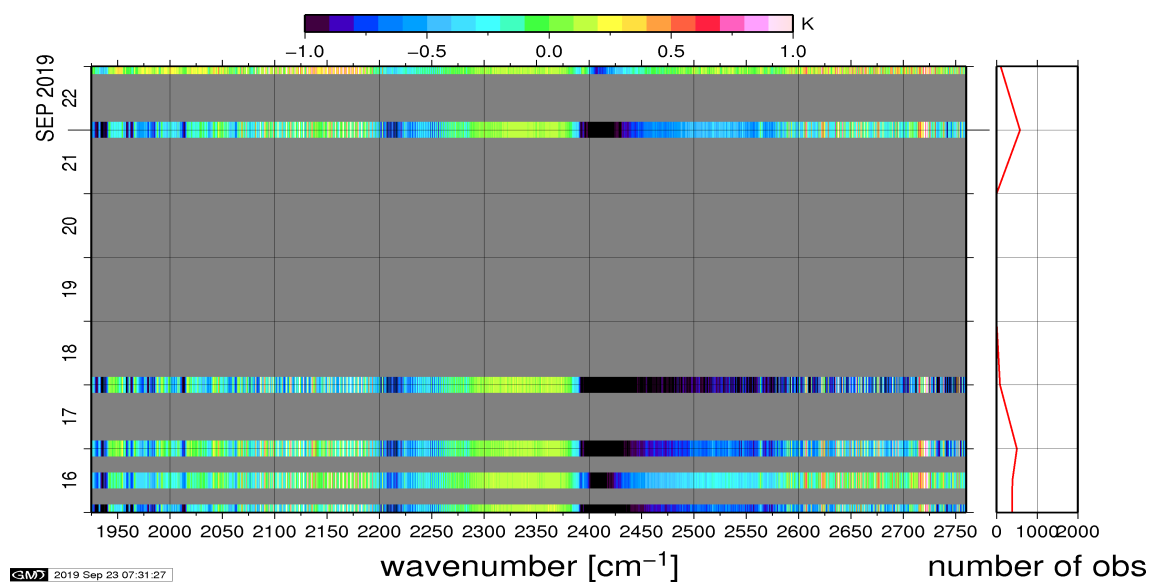


Figure 12: Radiance bias in BRT: IASI Band 3

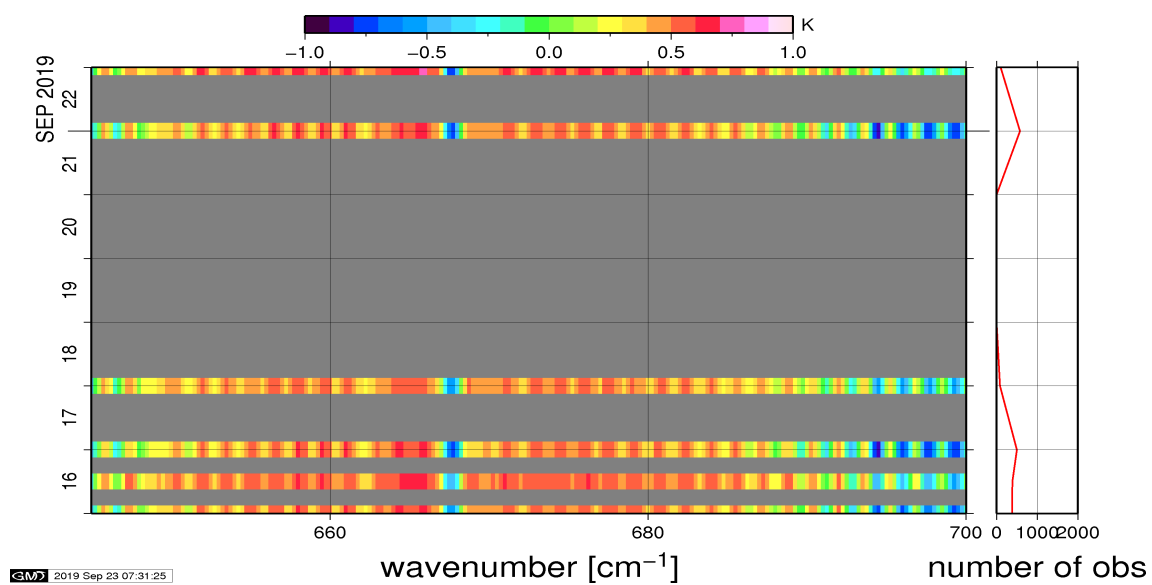


Figure 13: Radiance bias in BRT: CO2 14

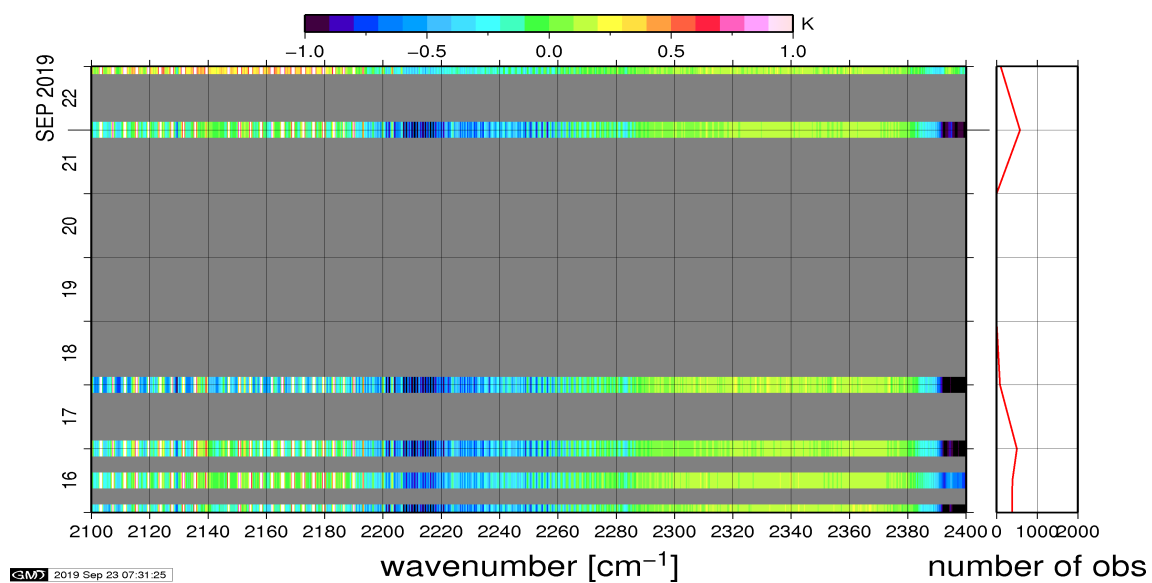


Figure 14: Radiance bias in BRT: CO2 4.3

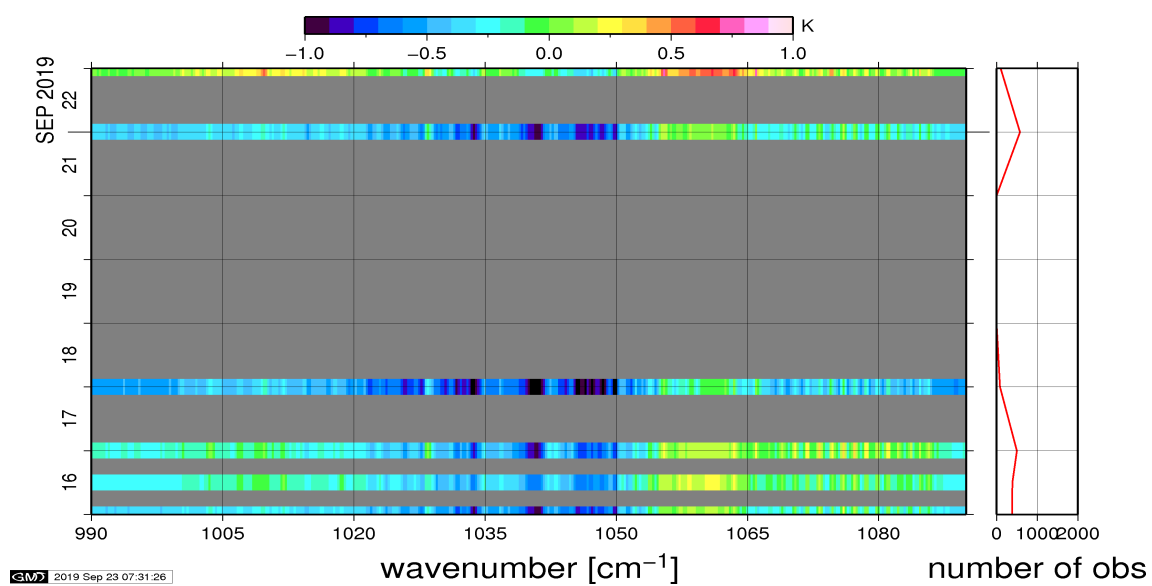


Figure 15: Radiance bias in BRT: O3

## 6 IASI-HIRS radiance comparison Channel 1-19

The radiance comparison of IASI and HIRS/4 on-board MetOp is performed on all pixel with distances smaller than 3 km between IASI and HIRS. The radiance differences IASI - HIRS are given in brightness temperatures at 280K reference temperature.

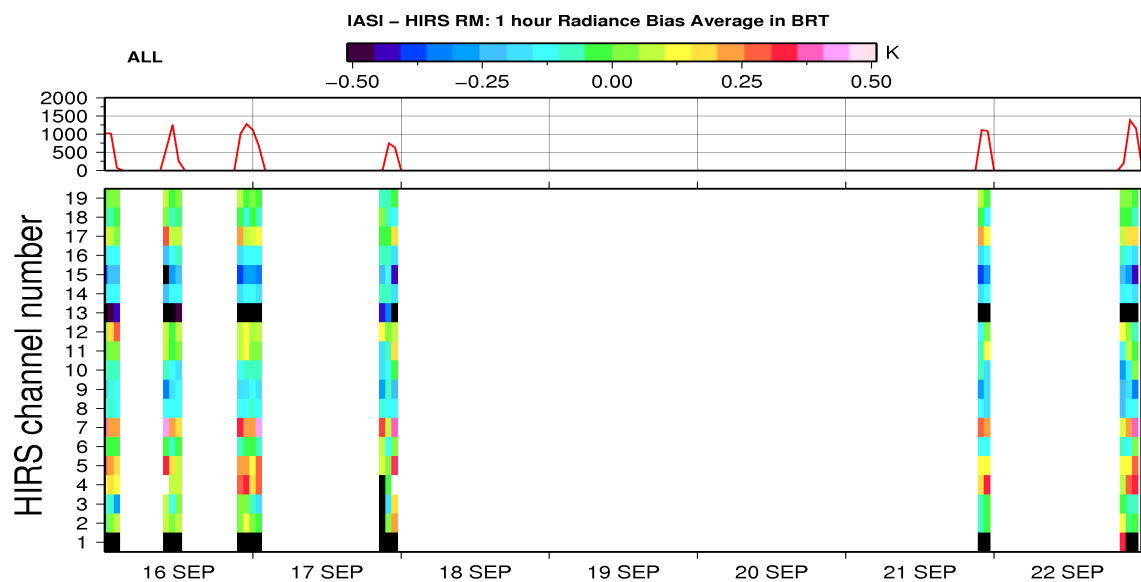


Figure 16: Radiance Differences in BRT 1h Average

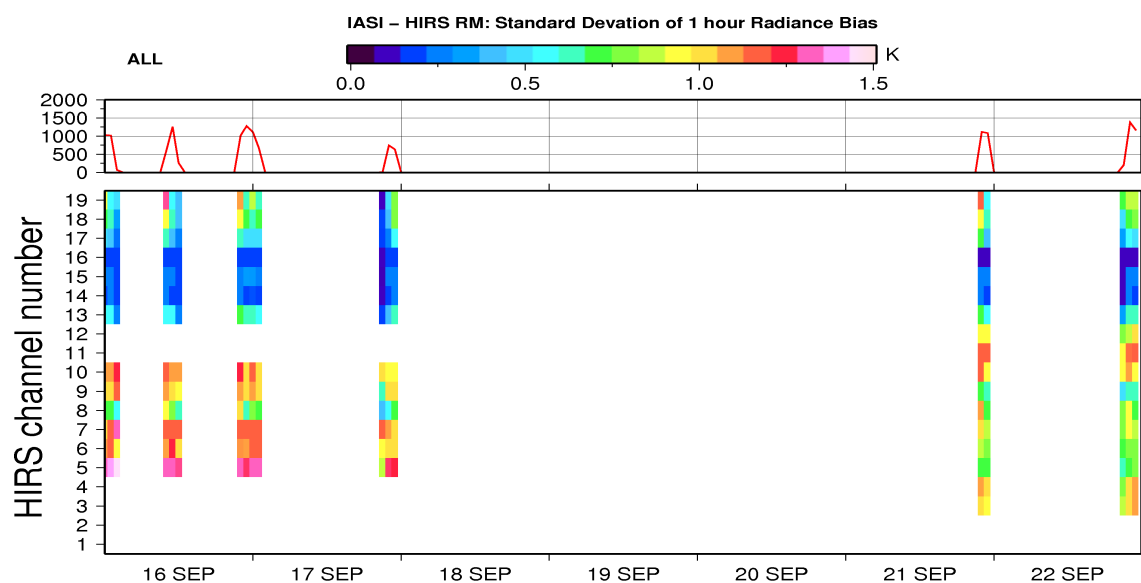


Figure 17: Standard Deviation of Radiance Differences 1h Average

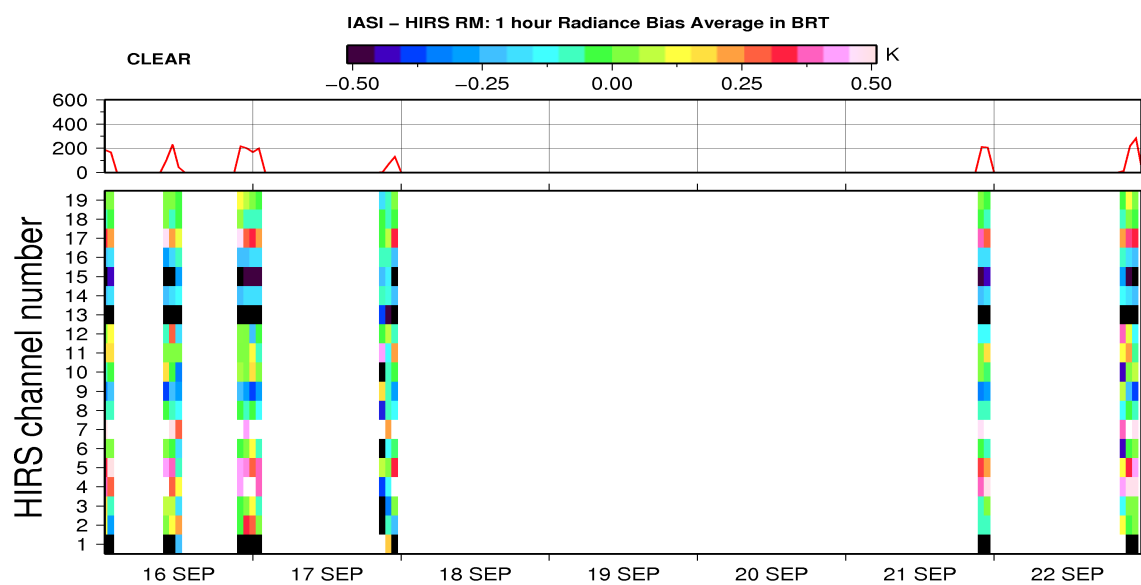


Figure 18: Radiance Differences in BRT 1h Average - Clear Sky

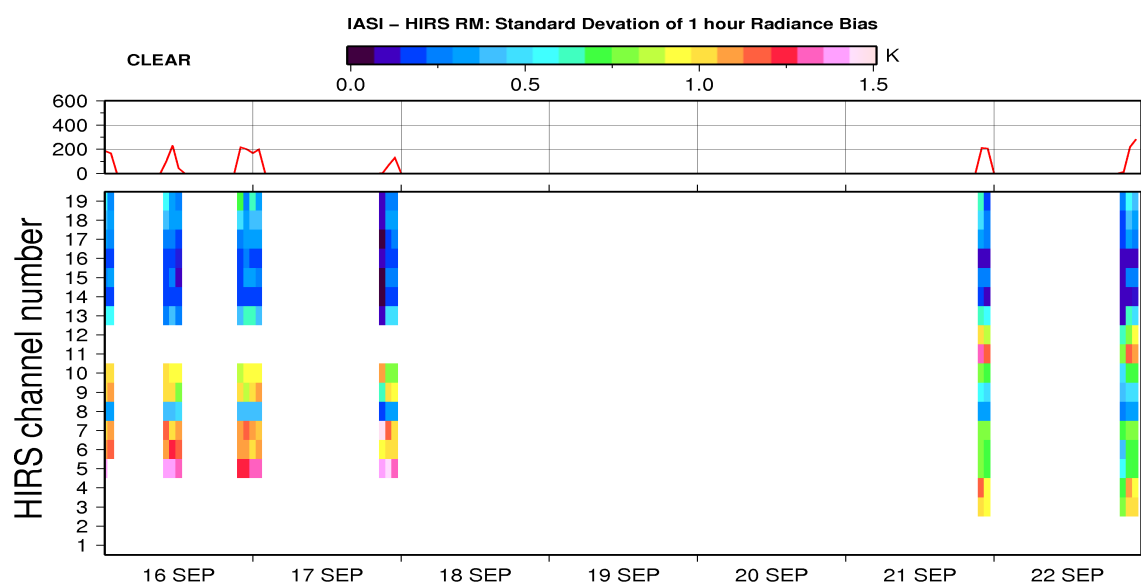


Figure 19: Standard Deviation of Radiance Differences 1h Average - Clear Sky