

# IASI L0 and L1 Daily Monitoring Report **Metop-A**

IASI monitoring team

17/09/2019 00:00:00 - 18/09/2019 00:00:00

## 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 minutes data packet) for 17/09/2019 00:00:00 - 18/09/2019 00:00:00 .

The monitoring data are extracted on PDU basis.

## 2 Data quantity 17/09/2019 00:00:00 - 18/09/2019 00:00:00

| Product Type                         | Number    | Action   |
|--------------------------------------|-----------|----------|
| L0 HKTM PDUs                         | 481       | -        |
| L0 IASI PDUs                         | 481       | -        |
| L1 ENG PDUs                          | 480       | -        |
| L1 ENG distinct GEPSGranule          | 481       | -        |
| <b>L1 DPX PDUs (RM: IASI-HIRS)</b>   | <b>51</b> | <b>e</b> |
| L1 DPS Files (RM: OBS-CAL NWP based) | 480       | -        |

Table 1: Data quantity

| APID      | Seq from | Seq to | Time from | Time to |
|-----------|----------|--------|-----------|---------|
| PX1 (130) | -        | -      | -         | -       |
| PX2 (135) | -        | -      | -         | -       |
| PX3 (140) | -        | -      | -         | -       |
| PX4 (145) | -        | -      | -         | -       |
| IMG (150) | -        | -      | -         | -       |
| VER (160) | -        | -      | -         | -       |
| AUX (180) | -        | -      | -         | -       |

Table 2: L0 data gaps

### 3 Instrument modes

| Time                | Transition from            | Transition to              |
|---------------------|----------------------------|----------------------------|
| 17/09/2019 00:09:54 | -                          | 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       |

Table 3: Instrument modes

### 4 L0 and L1 Data Quality

| Flag                        | Value   | Action |
|-----------------------------|---------|--------|
| L0 IASI PDUs                | 481     | -      |
| L1 ENG PDUs                 | 480     | -      |
| L1 ENG distinct GEPsGranule | 481     | -      |
| GQisFlagQual set (PX1)      | 99.42 % | -      |
| GQisFlagQual set (PX2)      | 99.42 % | -      |
| GQisFlagQual set (PX3)      | 98.89 % | -      |
| GQisFlagQual set (PX4)      | 99.02 % | -      |
| GQisFlagQual set (all)      | 99.19 % | -      |

Table 4: Quality flags

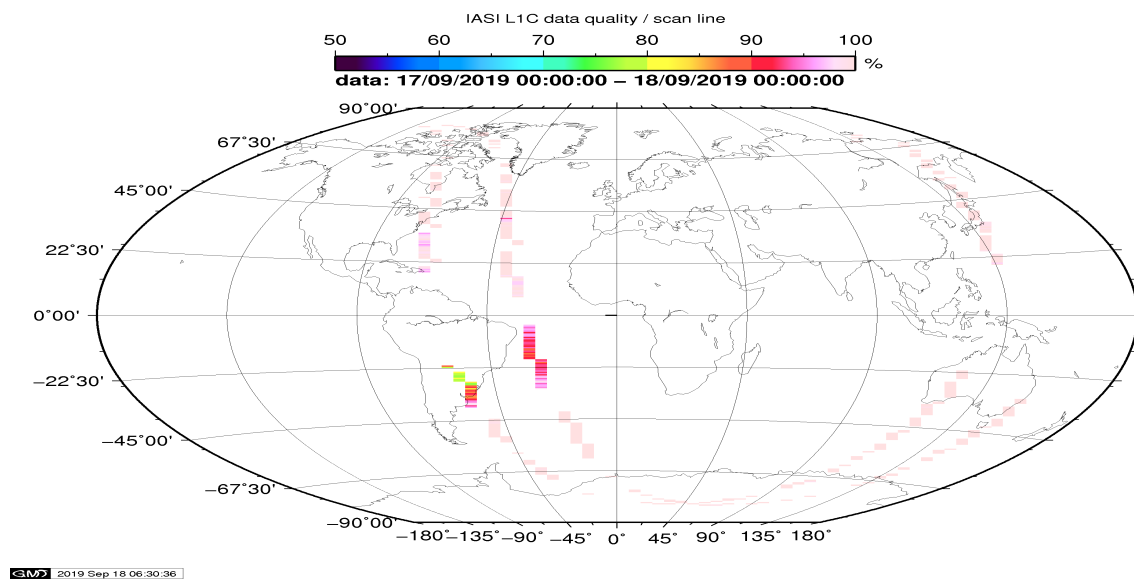


Figure 1: L1C data quality

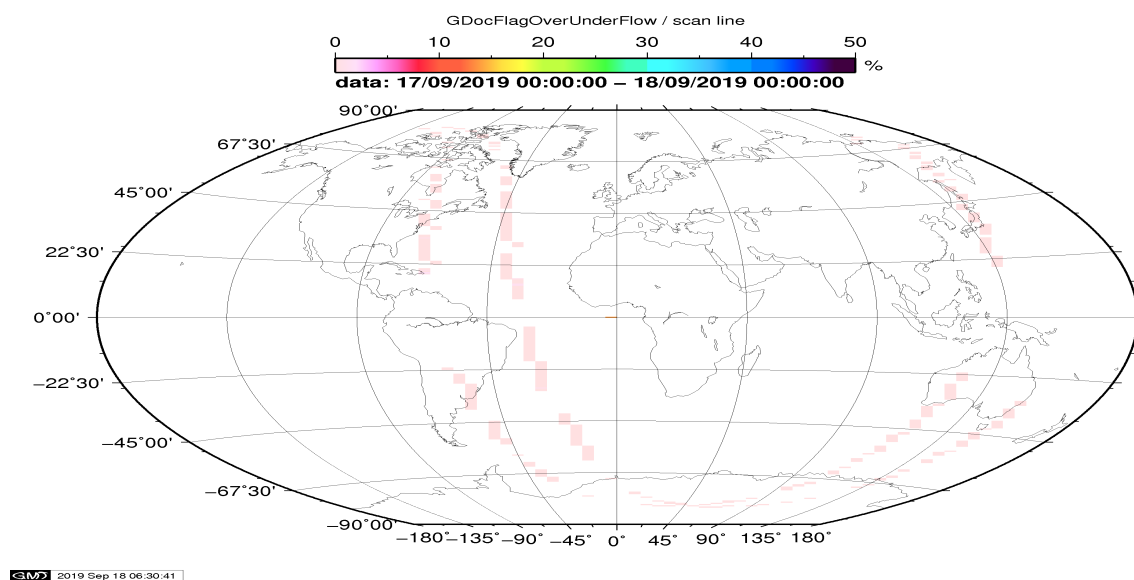


Figure 2: Flag of Over and Under Flows

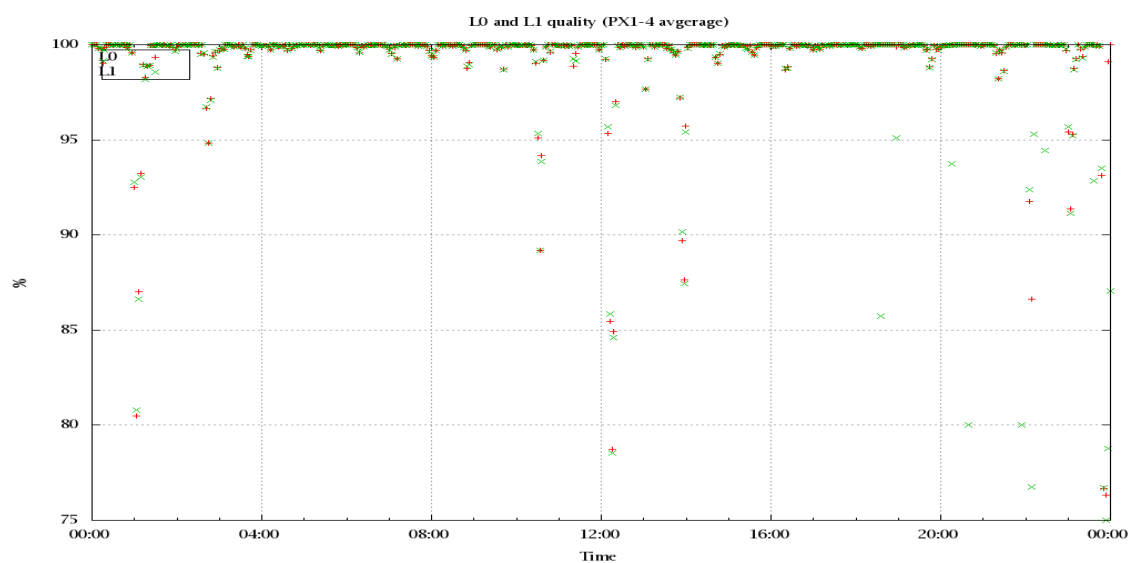


Figure 3: Level 0 and 1C overall quality

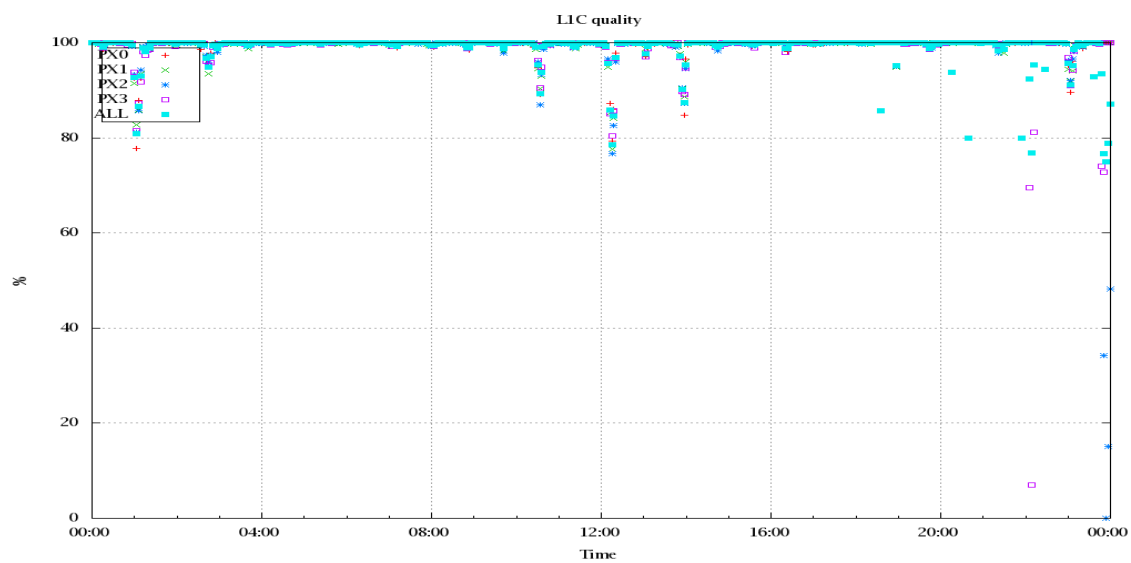


Figure 4: Level 1C quality

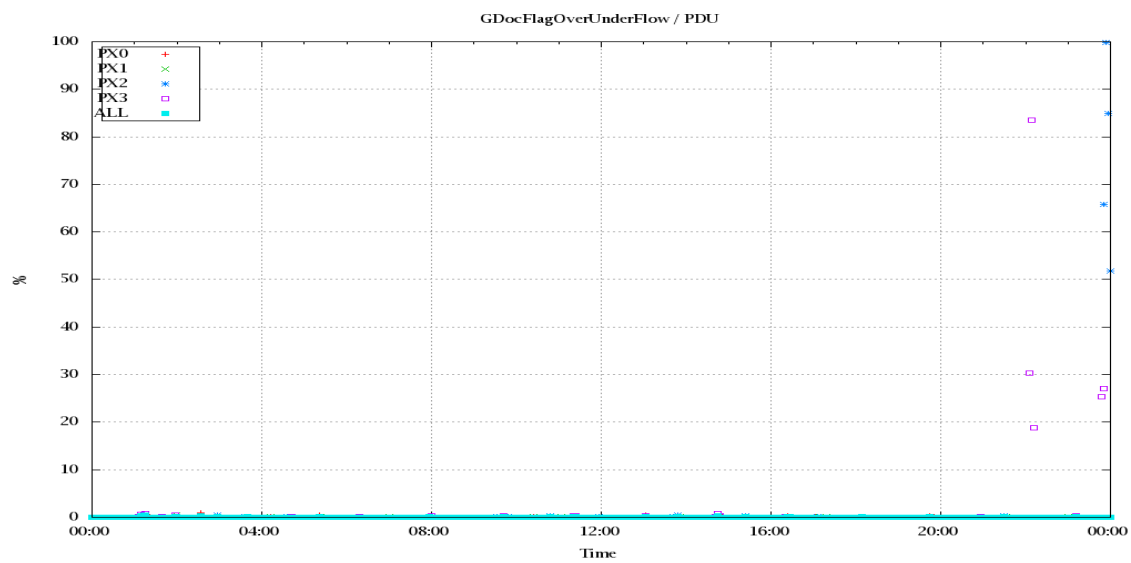


Figure 5: Timeseries of flag of Over and Under Flows

## 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, water vapor and Ozone. Between March 2007 and the 18th of May 2010 RTIASI in Version 4.0 is used. After that date 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). In the following figures 28 to 34, the so-called radiance anomaly is shown. The radiance anomaly is defined as the difference between the quarter daily radiance average OBS-CAL (over all pixels and scan positions 10 to 20) and the average bias OBS-CAL (over all pixels and scan positions 10 to 20) of the last 30 days.

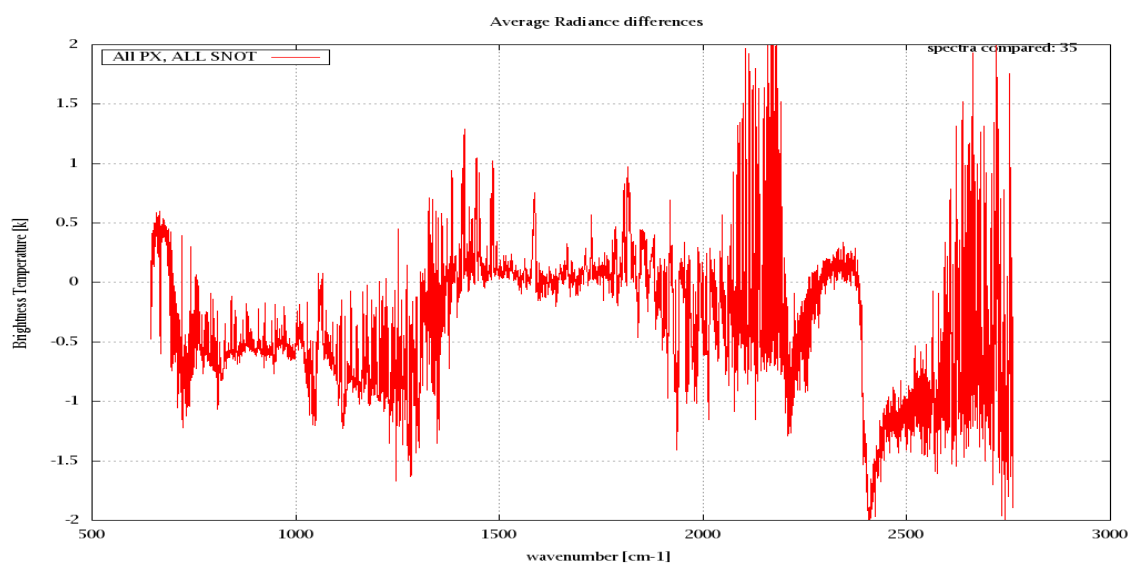


Figure 6: Average Radiance differences: OBS-CAL

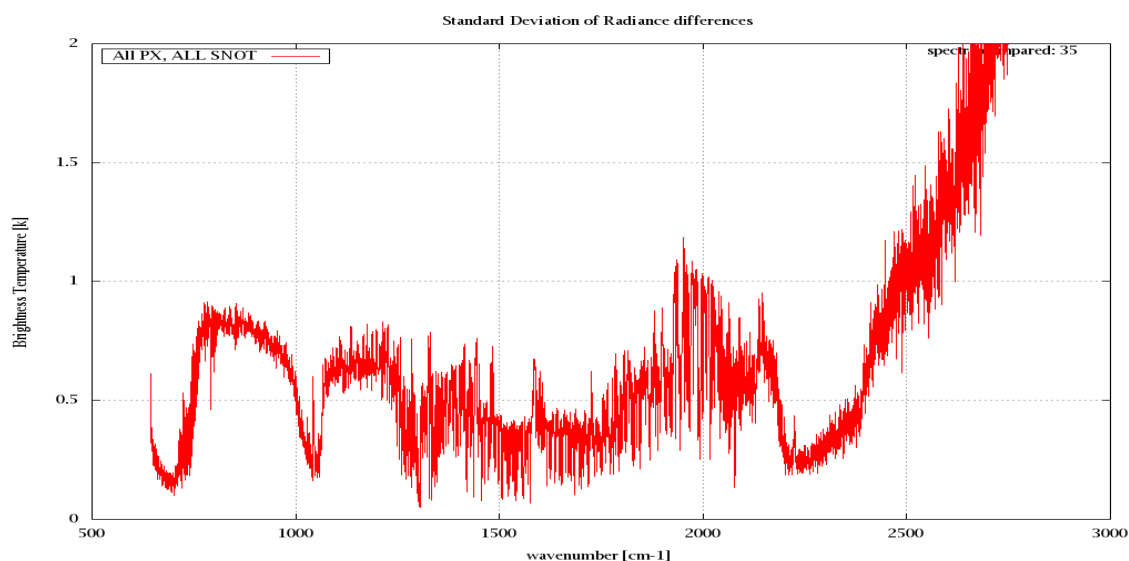


Figure 7: Standard Deviation of Radiance differences

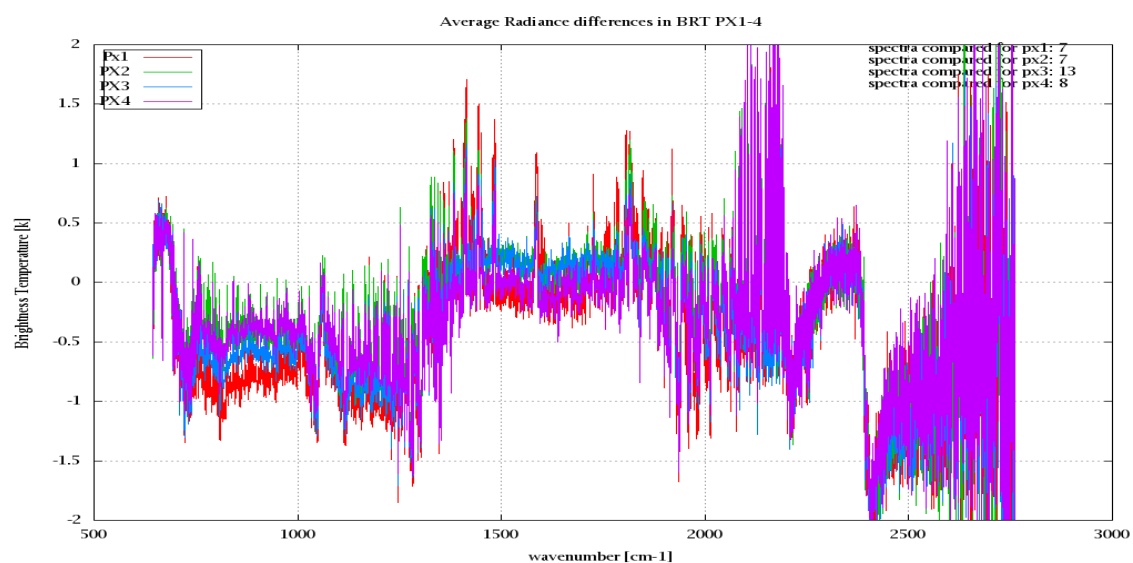


Figure 8: Average Radiance differences: OBS-CAL

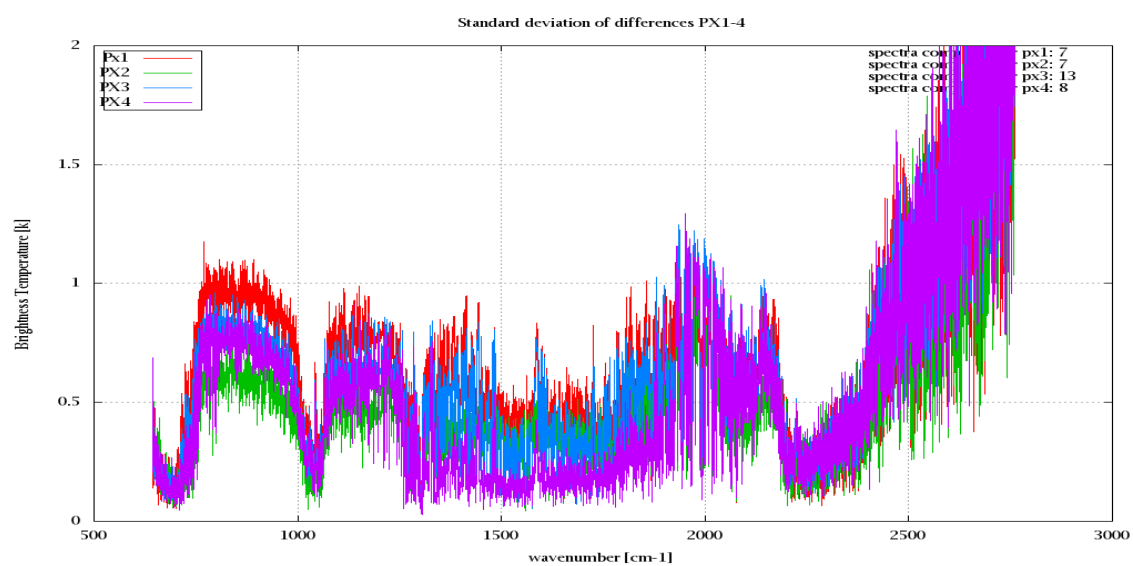


Figure 9: Standard Deviation of Radiance differences

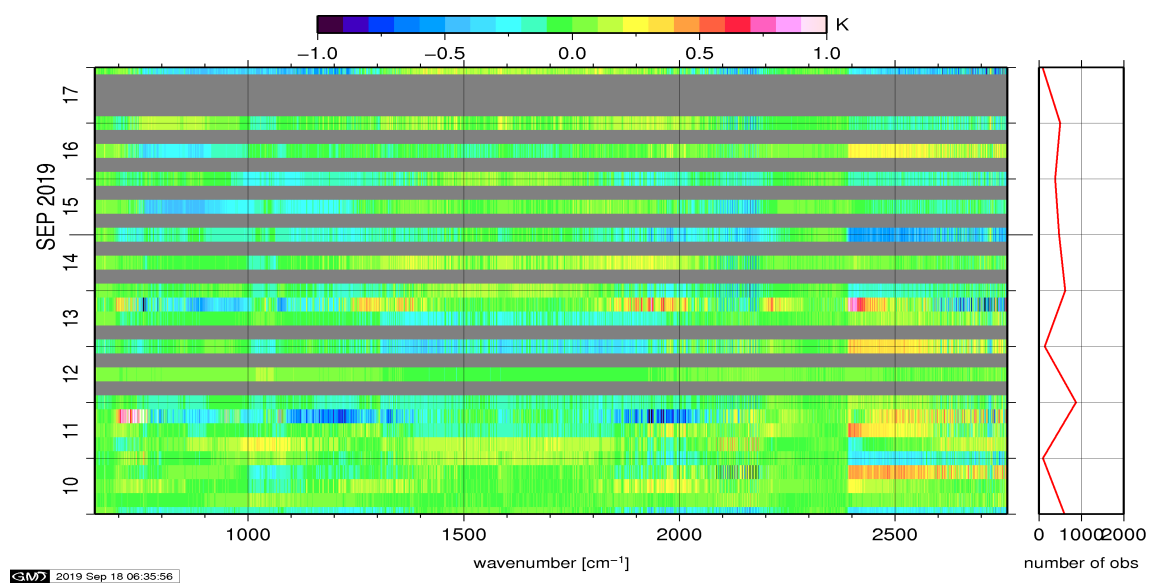


Figure 10: Radiance Anomaly in BT: All Channels

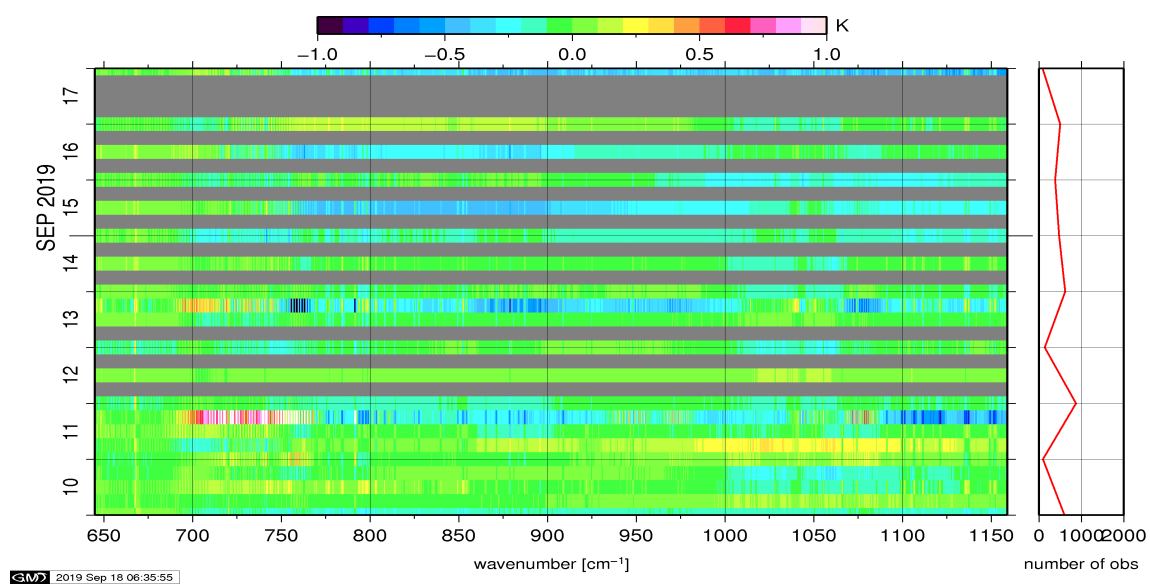


Figure 11: Radiance Anomaly in BT: IASI Band 1



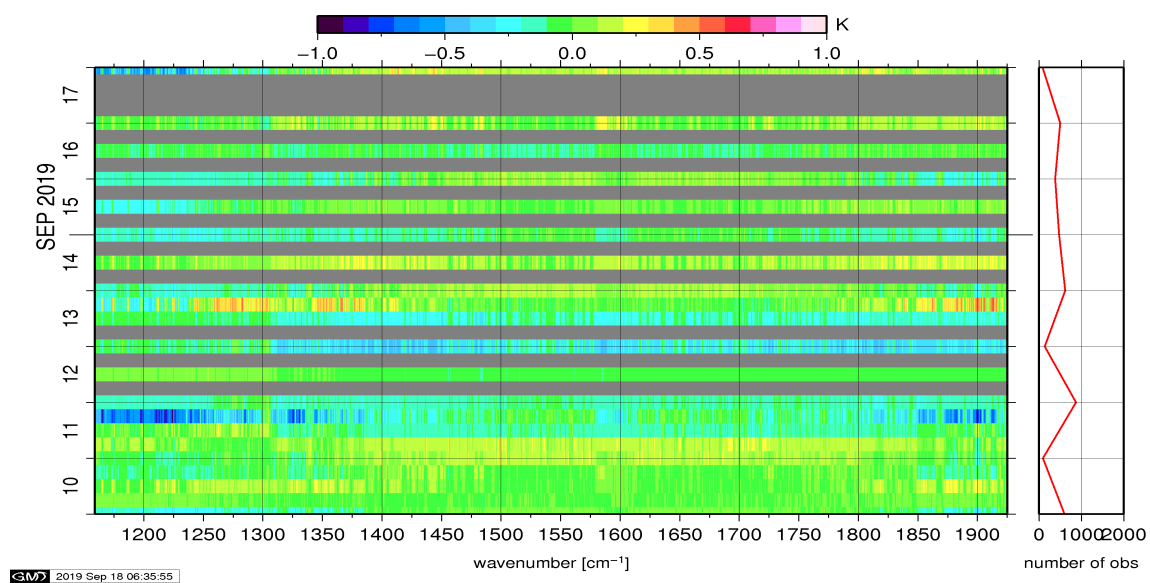


Figure 12: Radiance Anomaly in BT: IASI Band 2

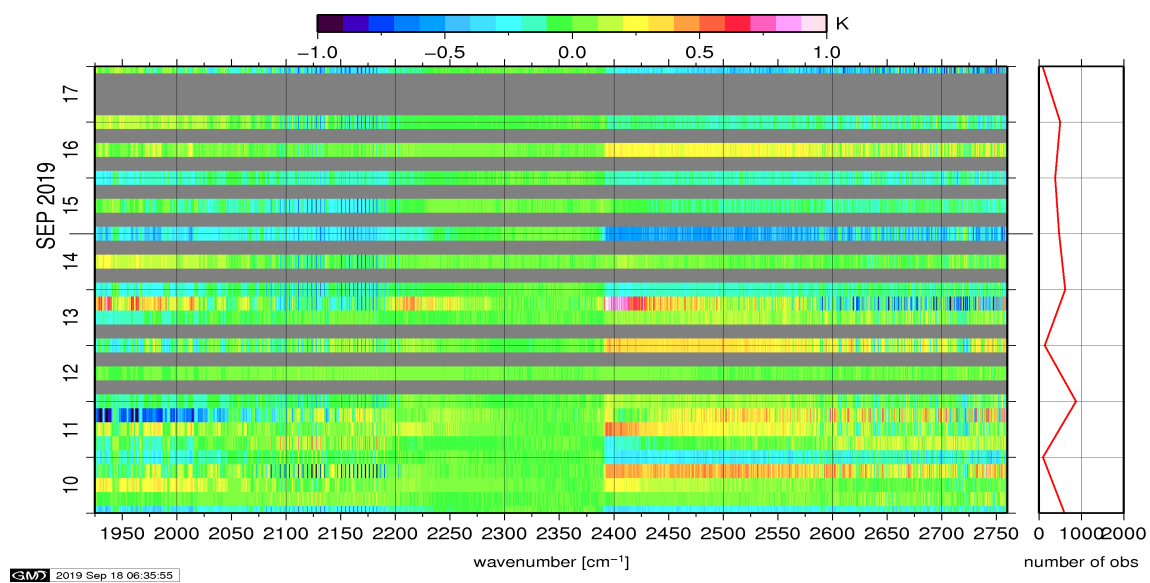


Figure 13: Radiance Anomaly in BT: IASI Band 3

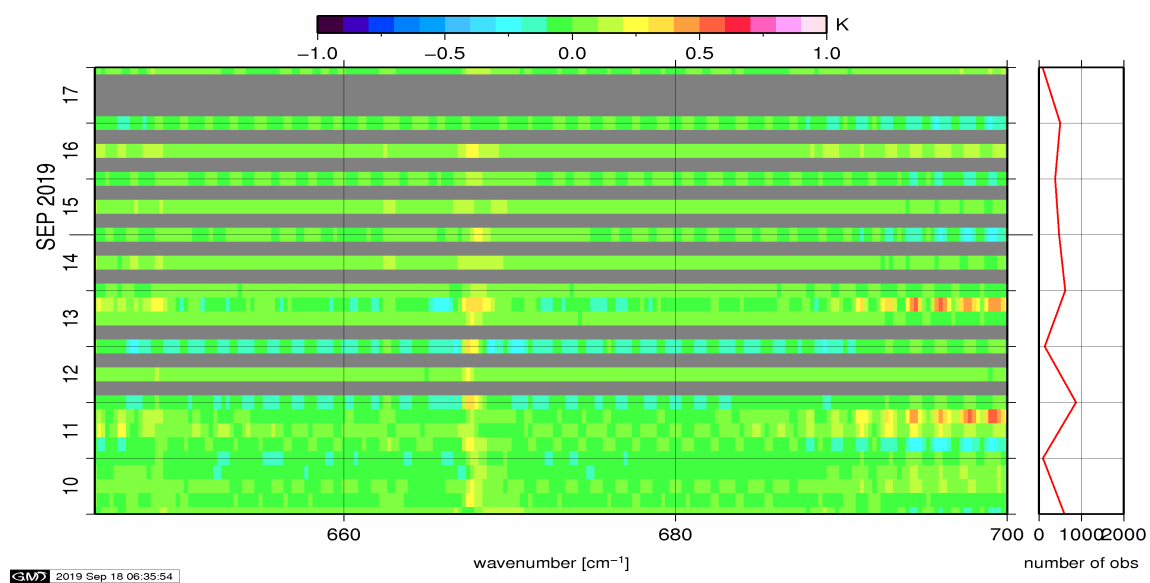


Figure 14: Radiance Anomaly in BT: CO2 14

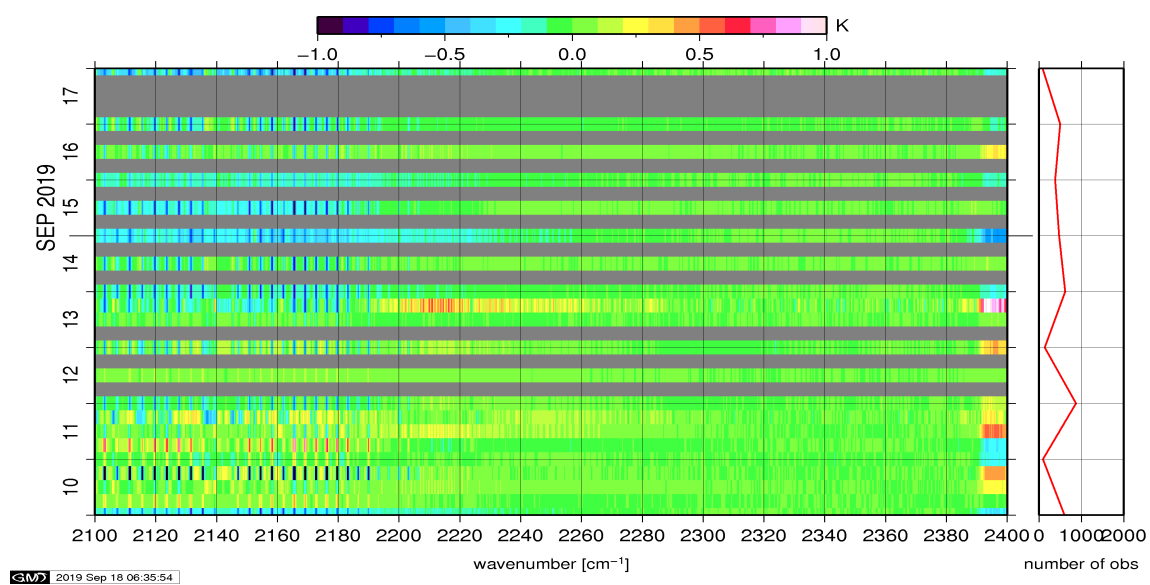


Figure 15: Radiance Anomaly in BT: CO2 4.3

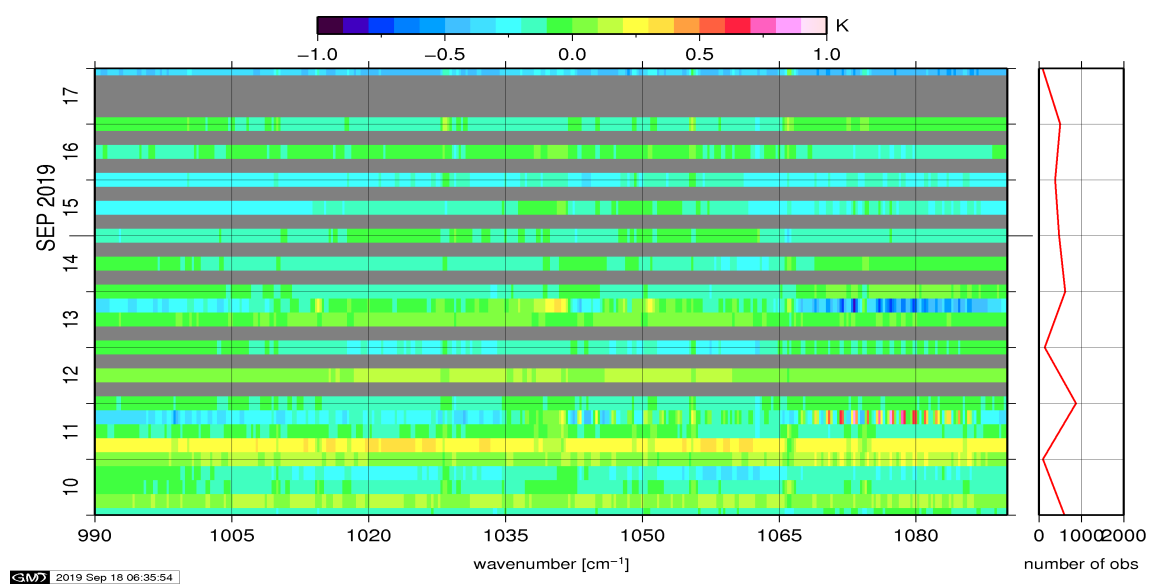


Figure 16: Radiance Anomaly in BT: O3

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

The radiance comparison of IASI and HIRS/4 on-board Metop is performed on all pixels with distances smaller than 3 km between IASI and HIRS. All sky conditions are covered. The radiance differences IASI - HIRS are given in brightness temperatures at 280K reference NeDT. All conditions (clear, cloudy, day and night) are given in red in the following figures. The clear sky conditions at night are given in green and the clear sky cases during daylight are displayed in blue.

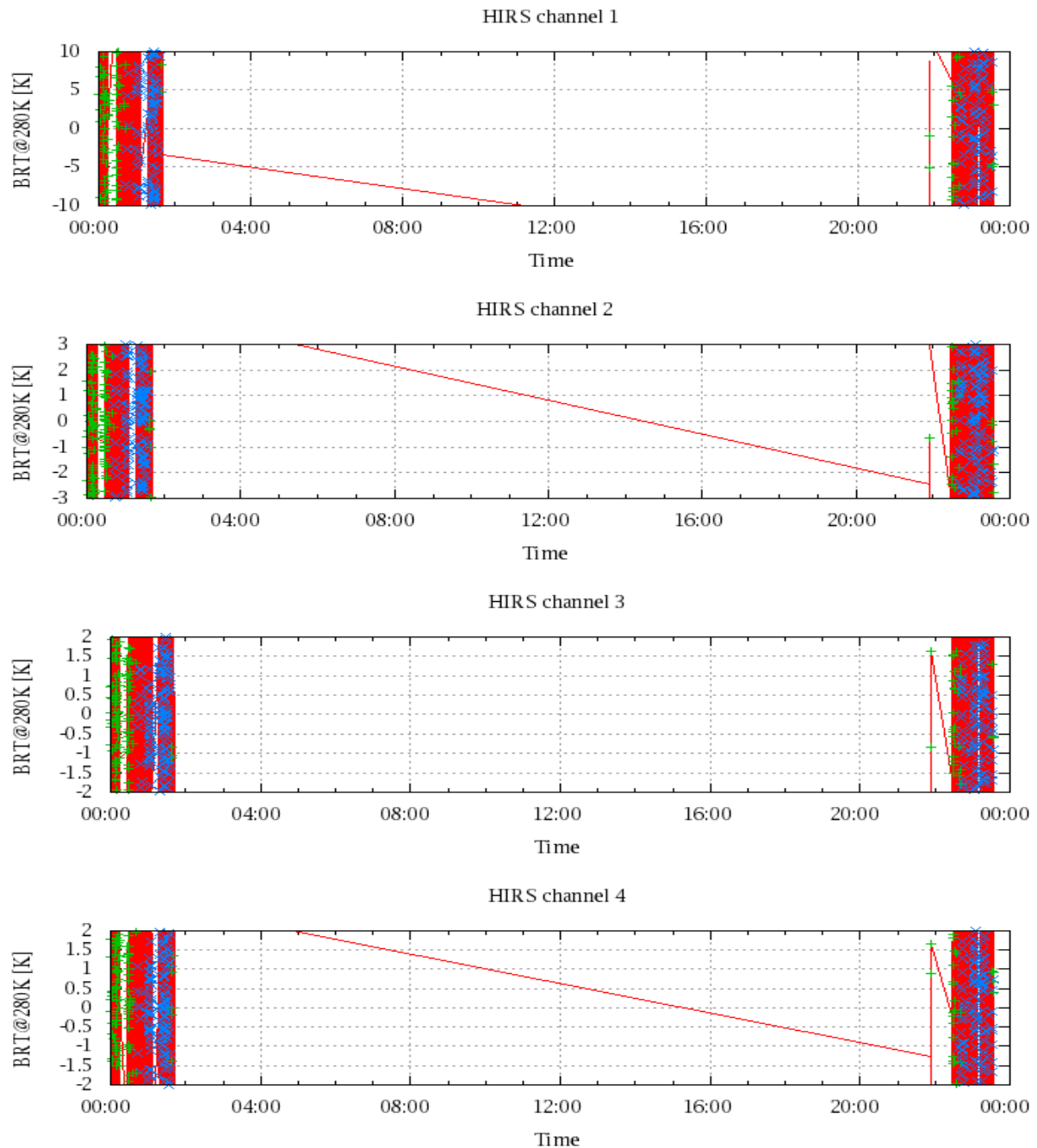


Figure 17: Radiance Differences in BT

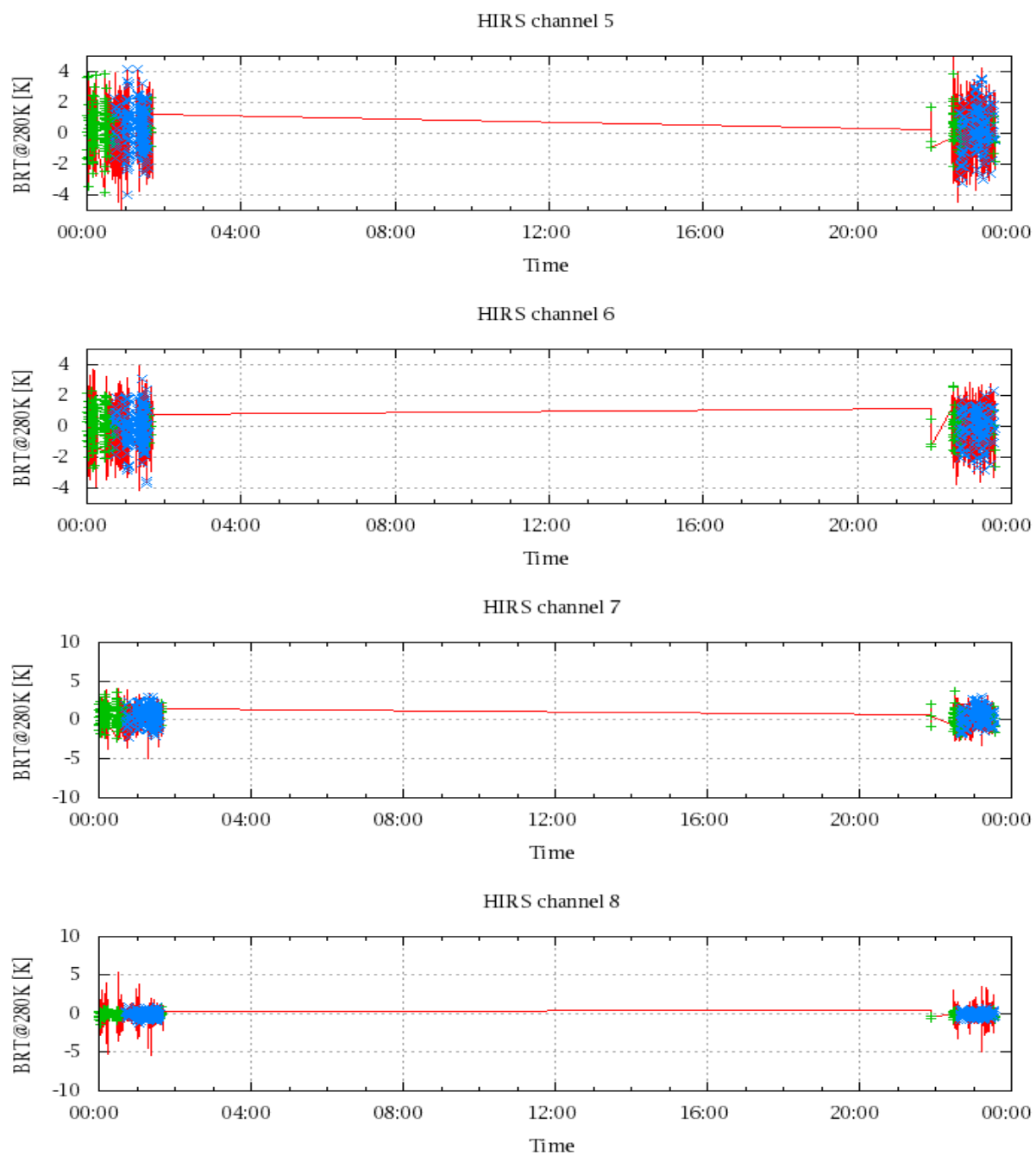


Figure 18: Radiance Differences in BT

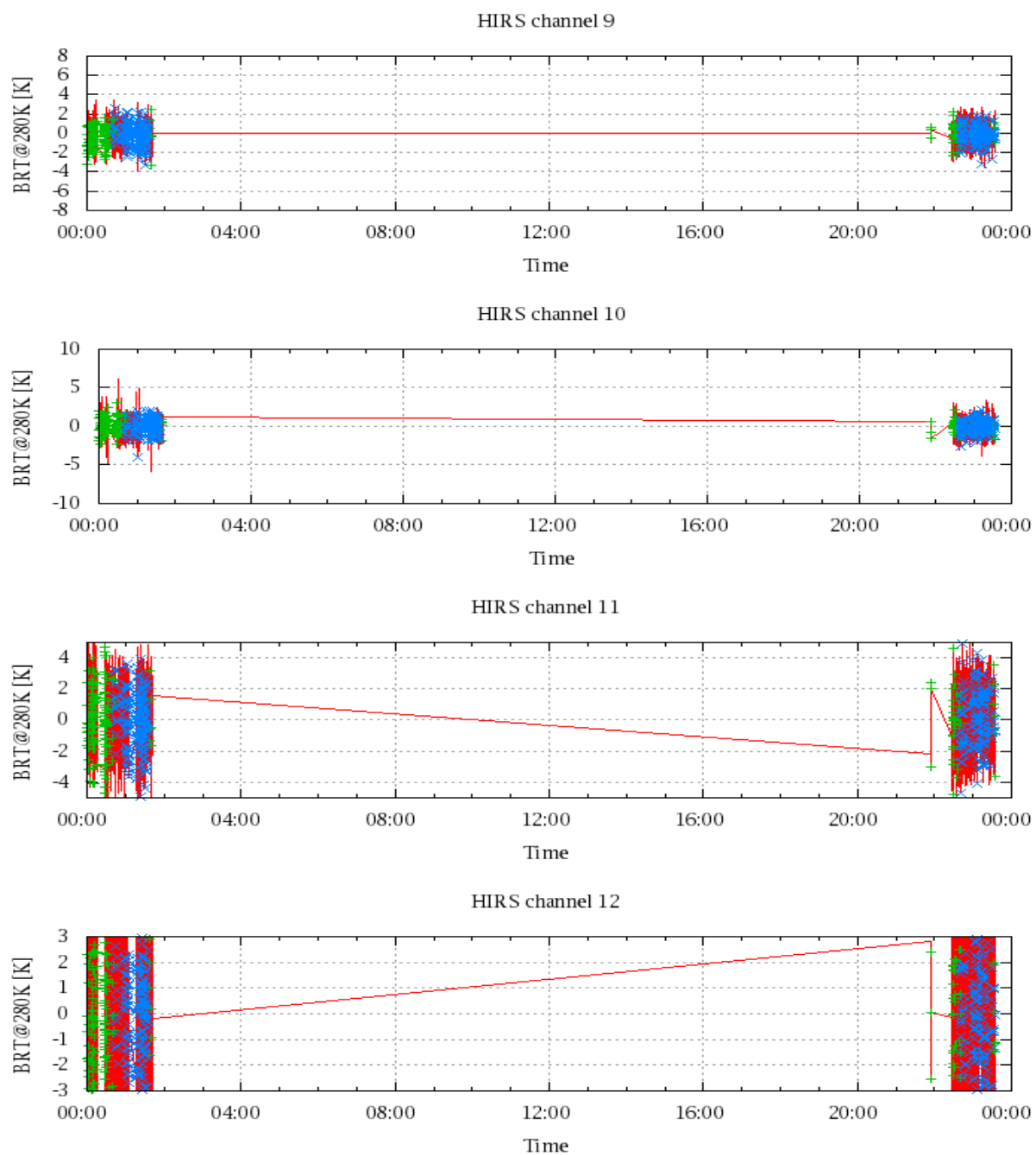


Figure 19: Radiance Differences in BT

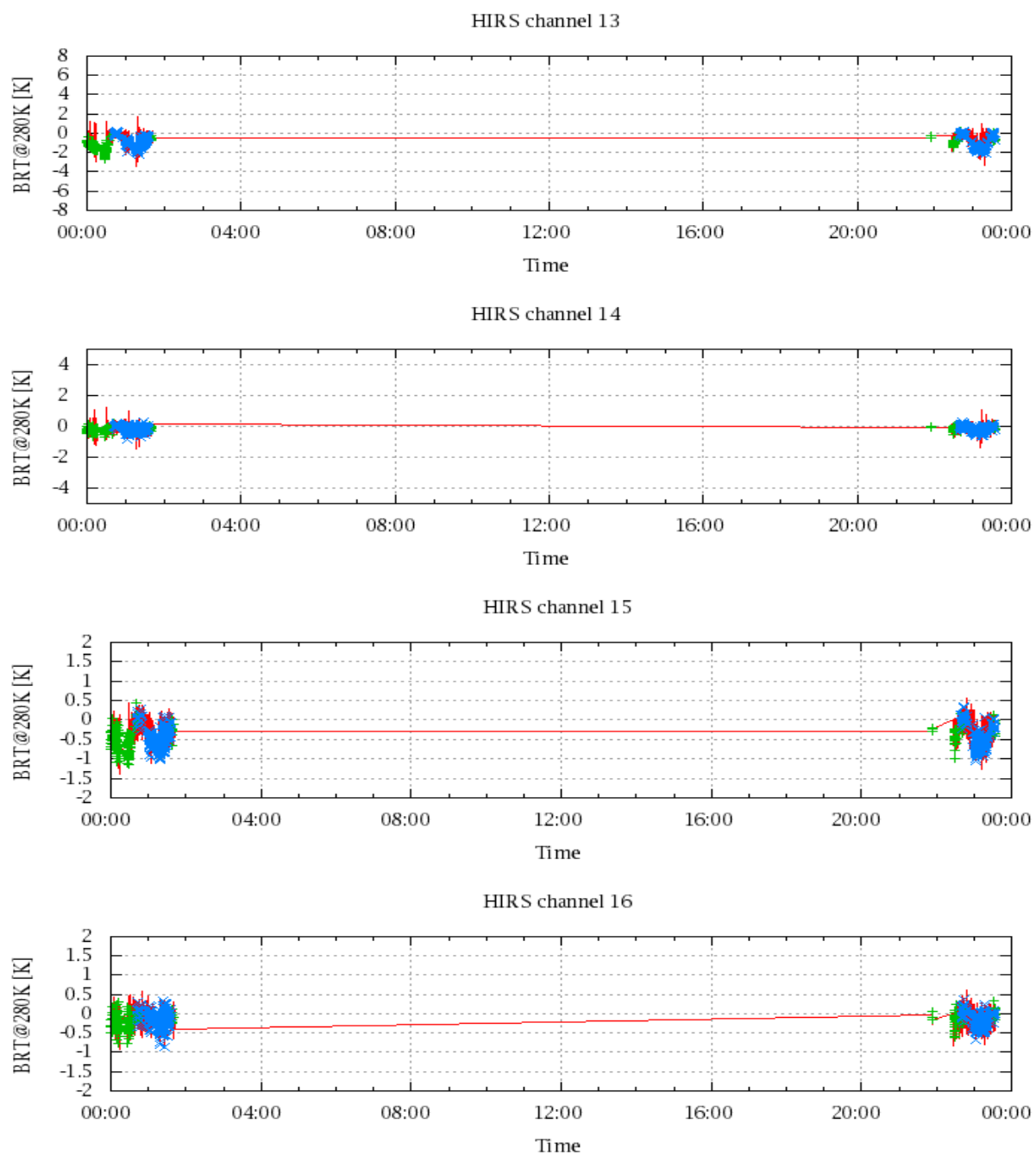


Figure 20: Radiance Differences in BT

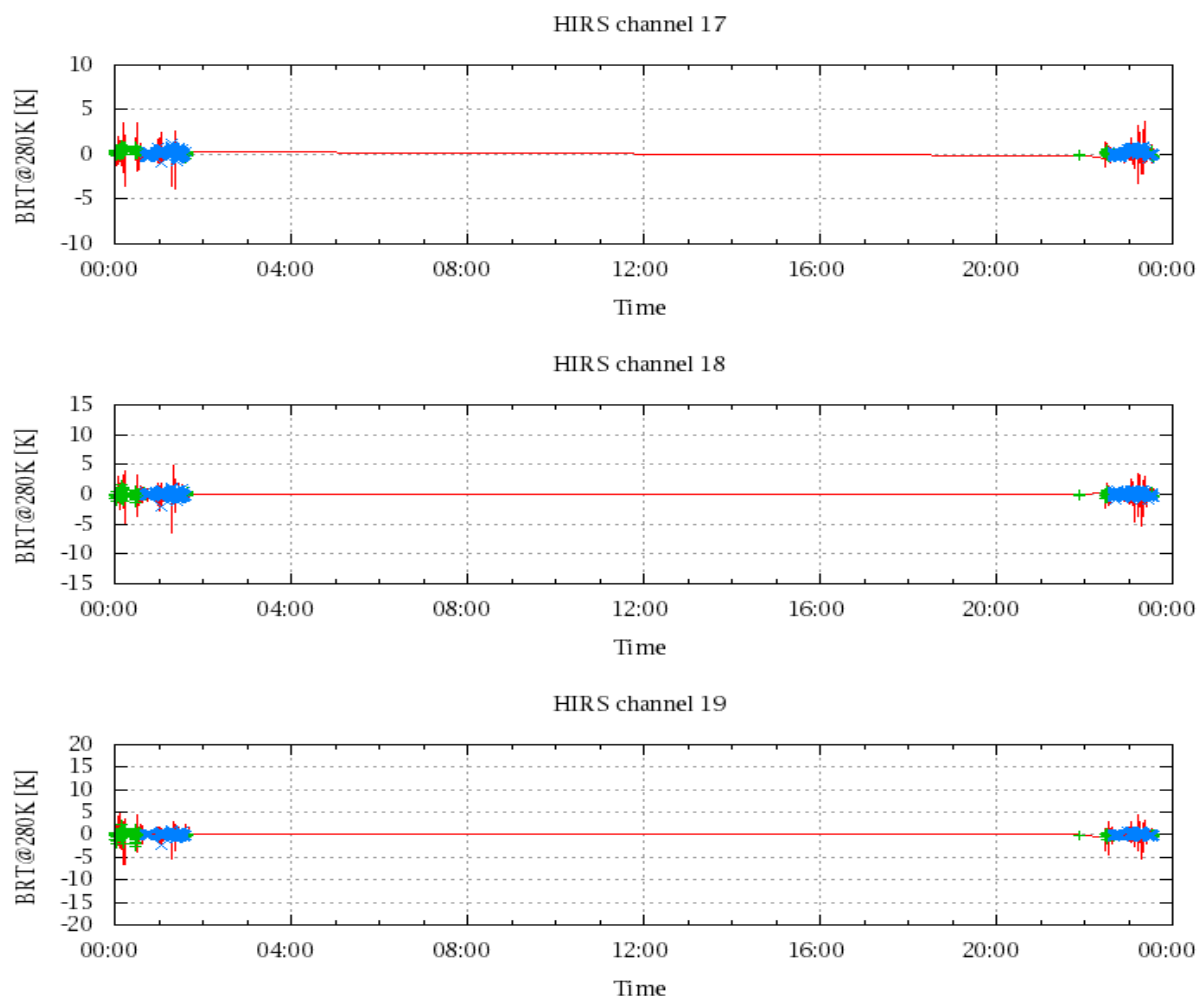


Figure 21: Radinace Differences in BT