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

IASI monitoring team

30/09/2019 00:00:00 - 01/10/2019 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 30/09/2019 00:00:00 - 01/10/2019 00:00:00 .

The monitoring data are extracted on PDU basis.

2   Data quantity 30/09/2019 00:00:00 - 01/10/2019 00:00:00

Product Type	Number	Action
L0 HKTM PDUs	481	-
L0 IASI PDUs	464	-
L1 ENG PDUs	463	-
L1 ENG distinct GEPSGranule	464	-
L1 DPX PDUs (RM: IASI-HIRS)	0	e
L1 DPS Files (RM: OBS-CAL NWP based)	463	-

Table 1: Data quantity

APID	Seq from	Seq to	Time from	Time to
PX1 (130)	8621	0	20190930134709.404	20190930143911.147
PX2 (135)	8621	0	20190930134709.404	20190930143911.147
PX3 (140)	8621	0	20190930134709.404	20190930143911.147
PX4 (145)	8621	0	20190930134709.404	20190930143911.147
IMG (150)	16269	0	20190930134709.404	20190930143911.147
VER (160)	5548	2210	20190930134709.404	20190930153850.358
VER (160)	2210	2215	20190930153850.358	20190930153850.358
VER (160)	2215	2220	20190930153850.358	20190930153850.358
VER (160)	2220	2225	20190930153850.358	20190930153850.358
VER (160)	2225	2230	20190930153850.358	20190930153850.358
VER (160)	2230	2211	20190930153850.358	20190930153850.358
VER (160)	2211	2216	20190930153850.358	20190930153850.358
VER (160)	2216	2221	20190930153850.358	20190930153850.358
VER (160)	2221	2226	20190930153850.358	20190930153850.358
VER (160)	2226	2231	20190930153850.358	20190930153850.358
VER (160)	2231	2212	20190930153850.358	20190930153850.358
VER (160)	2212	2217	20190930153850.358	20190930153850.358
VER (160)	2217	2222	20190930153850.358	20190930153850.358
VER (160)	2222	2227	20190930153850.358	20190930153850.358
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Table 2 – continued from previous page

APID	Seq from	Seq to	Time from	Time to
VER (160)	2227	2232	20190930153850.358	20190930153850.358
VER (160)	2232	2213	20190930153850.358	20190930153850.358
VER (160)	2213	2218	20190930153850.358	20190930153850.358
VER (160)	2218	2223	20190930153850.358	20190930153850.358
VER (160)	2223	2228	20190930153850.358	20190930153850.358
VER (160)	2228	2233	20190930153850.358	20190930153850.358
VER (160)	2233	2214	20190930153850.358	20190930153850.358
VER (160)	2214	2219	20190930153850.358	20190930153850.358
VER (160)	2219	2224	20190930153850.358	20190930153850.358
VER (160)	2224	2229	20190930153850.358	20190930153850.358
VER (160)	2229	2234	20190930153850.358	20190930153850.358
AUX (180)	14199	0	20190930134701.834	20190930143917.850

Table 2: L0 data gaps

2

3   Instrument modes

Time	Transition from	Transition to
30/09/2019 00:00:00	-	Normal operation
30/09/2019 13:47:27	Normal operation	Auxiliary ASE synchronised
30/09/2019 13:48:31	Auxiliary ASE synchronised	Heater 2
30/09/2019 13:49:19	Heater 2	Heater 1 warm up
30/09/2019 13:50:23	Heater 1 warm up	Heater 2
30/09/2019 14:18:07	Heater 2	Auxiliary ASE synchronised
30/09/2019 14:39:11	Auxiliary ASE synchronised	Normal operation

Table 3: Instrument modes

4   L0 and L1 Data Quality

Flag	Value	Action
L0 IASI PDUs	464	-
L1 ENG PDUs	463	-
L1 ENG distinct GEPSGranule	464	-
GQisFlagQual set (PX1)	99.40 %	-
GQisFlagQual set (PX2)	99.44 %	-
GQisFlagQual set (PX3)	99.41 %	-
GQisFlagQual set (PX4)	99.40 %	-
GQisFlagQual set (all)	99.41 %	-

Table 4: Quality flags
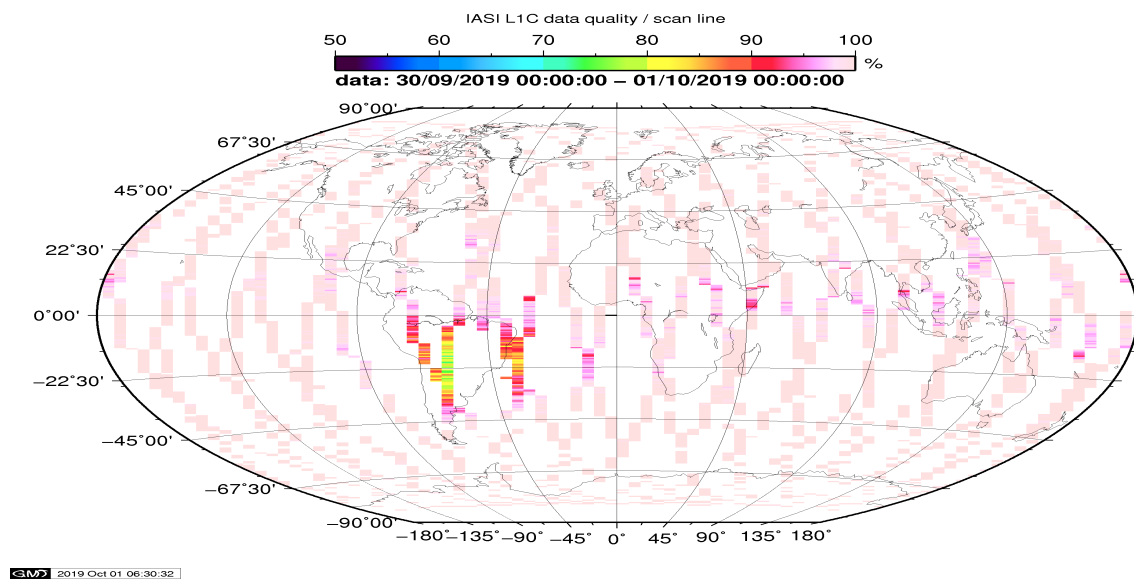
Figure 1: L1C data quality
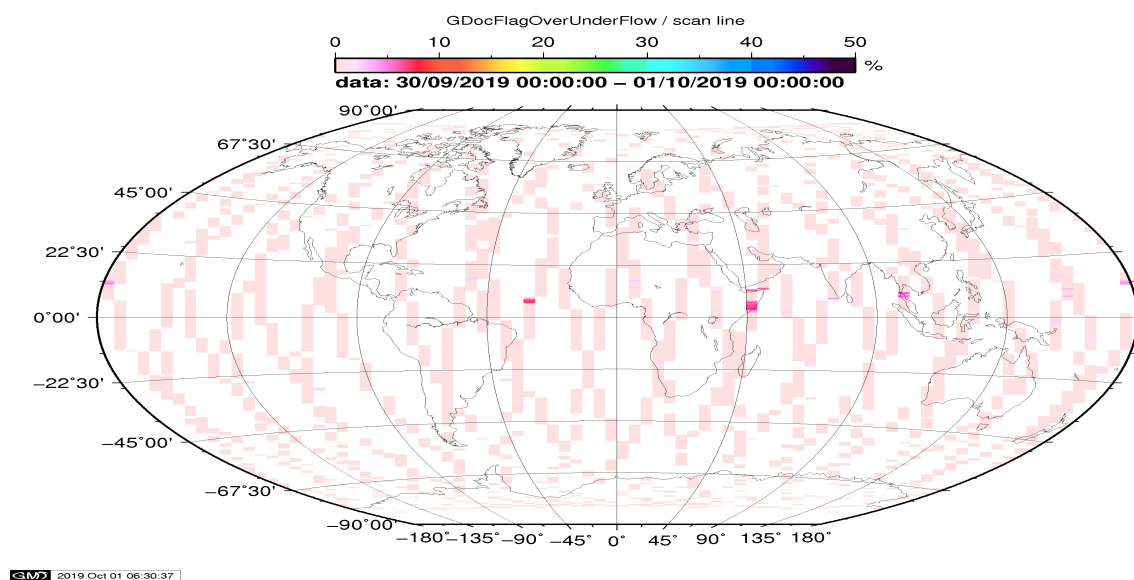
Figure 2: Flag of Over and Under Flows
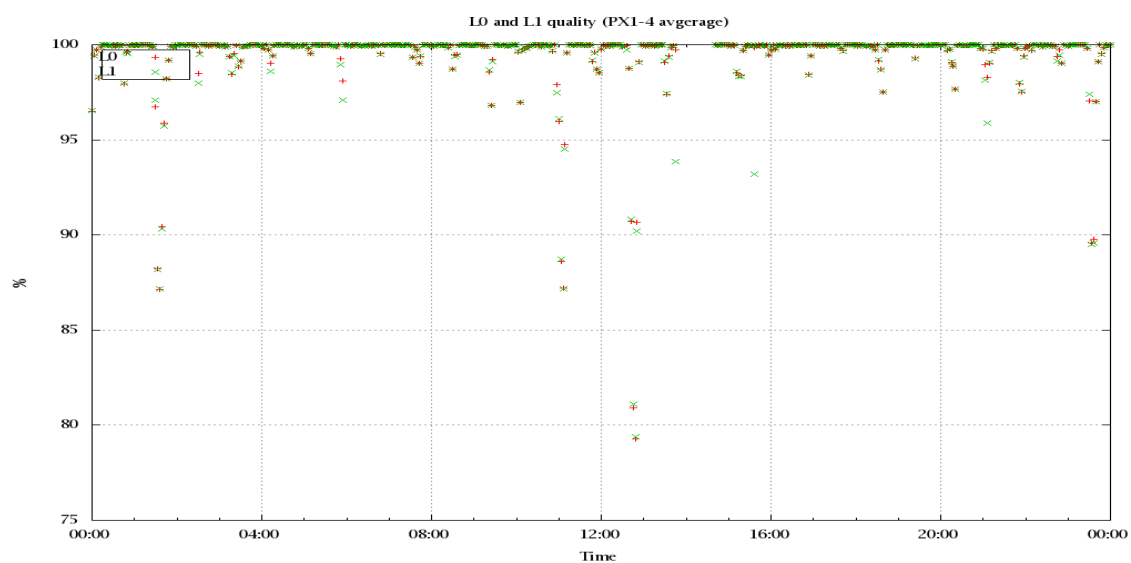
Figure 3: Level 0 and 1C overall quality
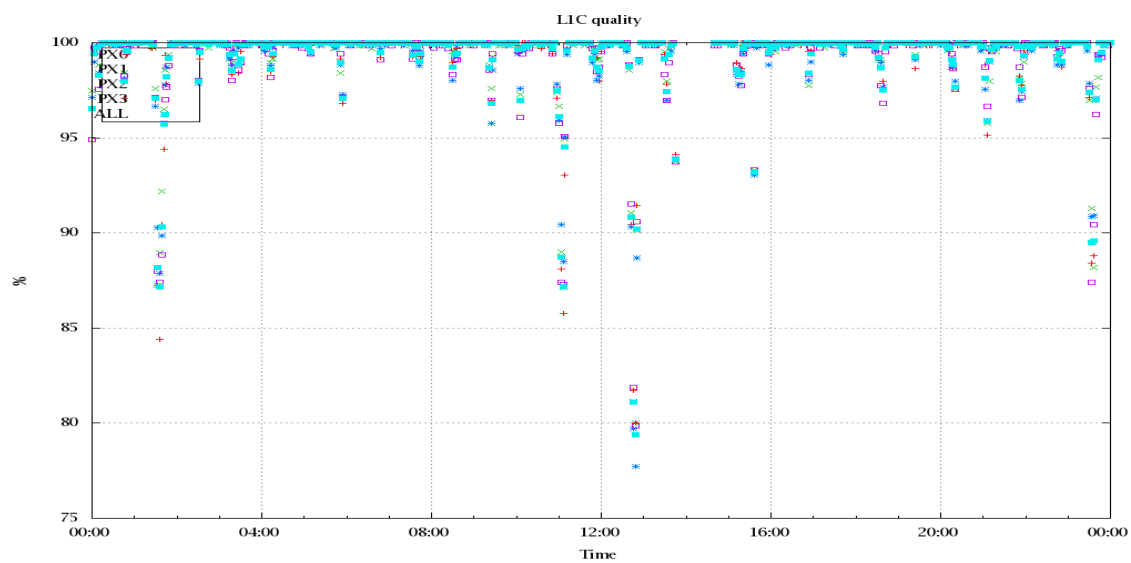
Figure 4: Level 1C quality
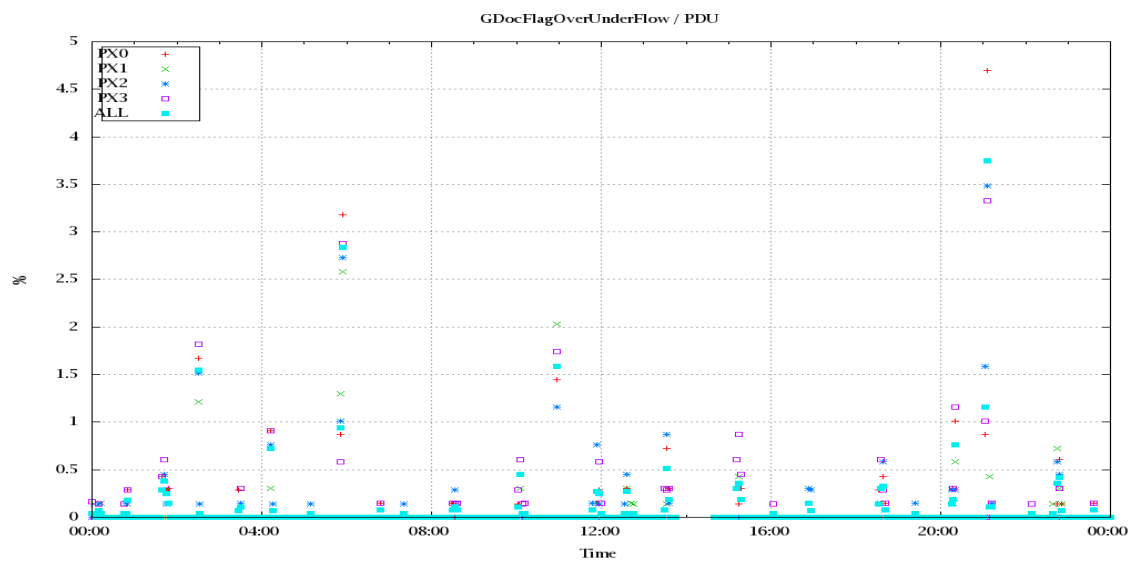
Figure 5: Timeseries of flag of Over and Under Flows

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 indentification 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.
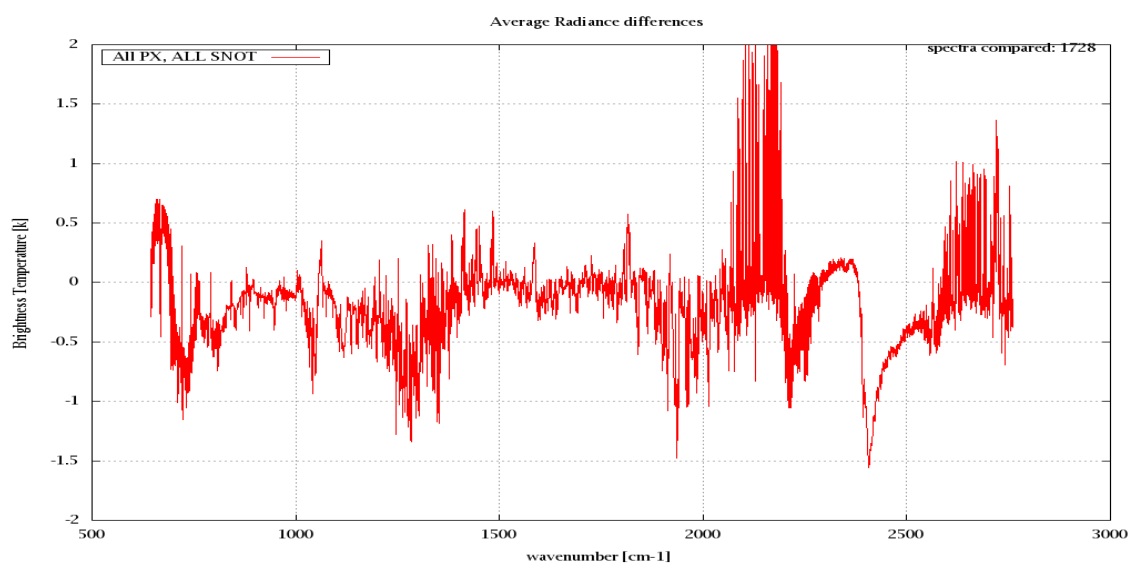
Figure 6: Average Radiance differences: OBS-CAL
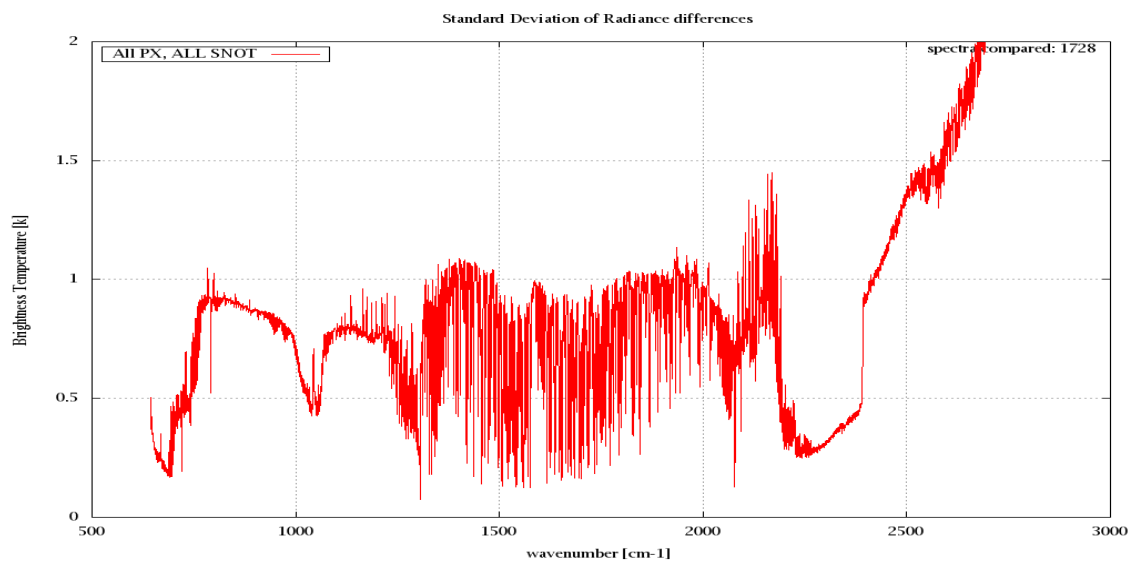
Figure 7: Standard Deviation of Radiance differences
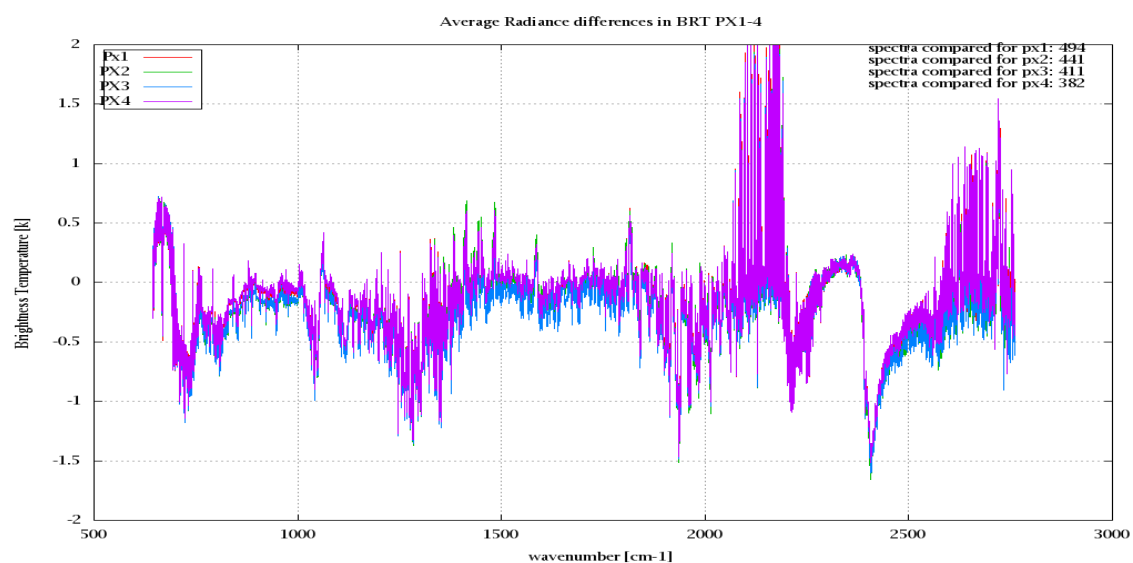
Figure 8: Average Radiance differences: OBS-CAL
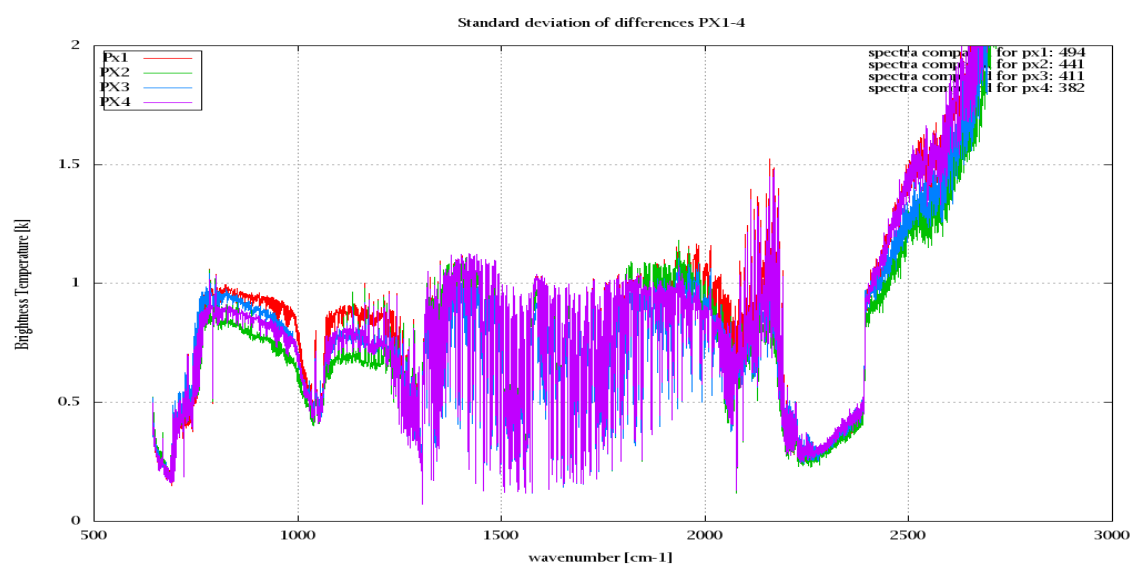

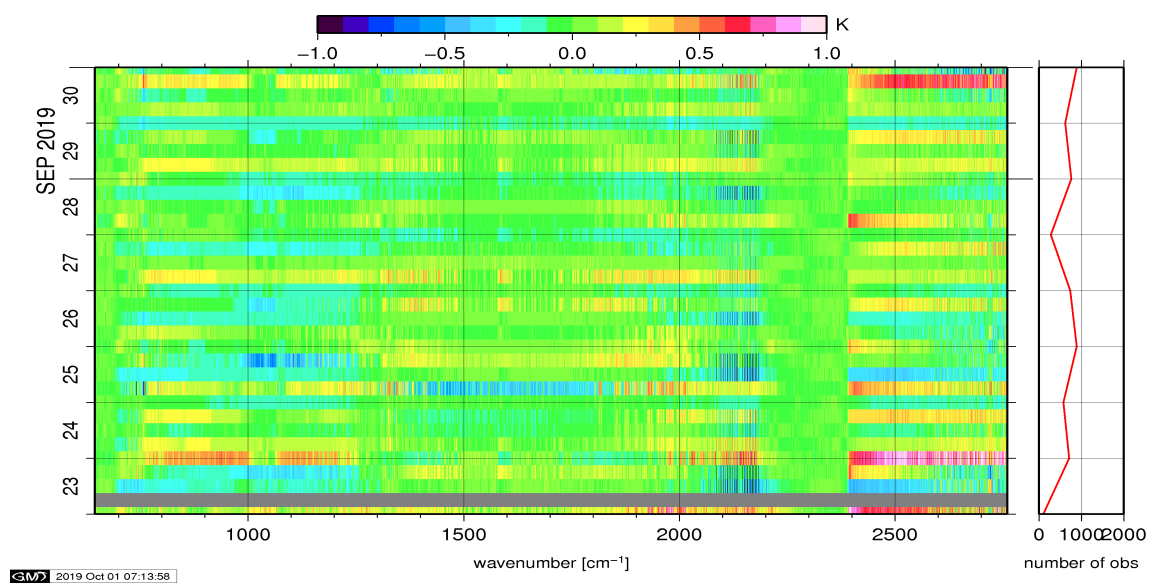Figure 9: Standard Deviation of Radiance differences

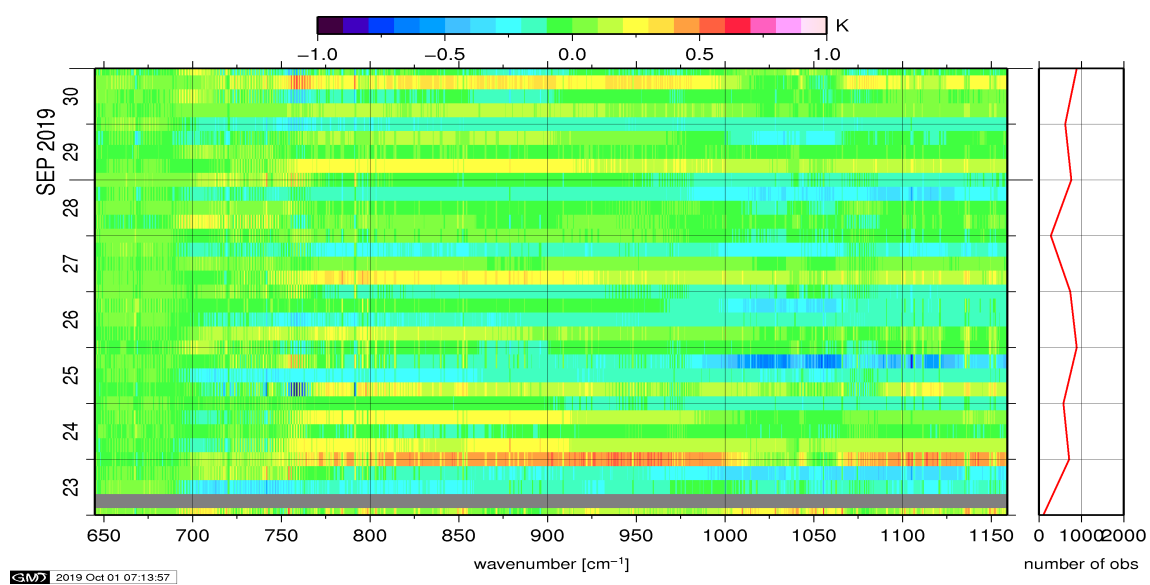Figure 10: Radiance Anomaly in BT: All Channels

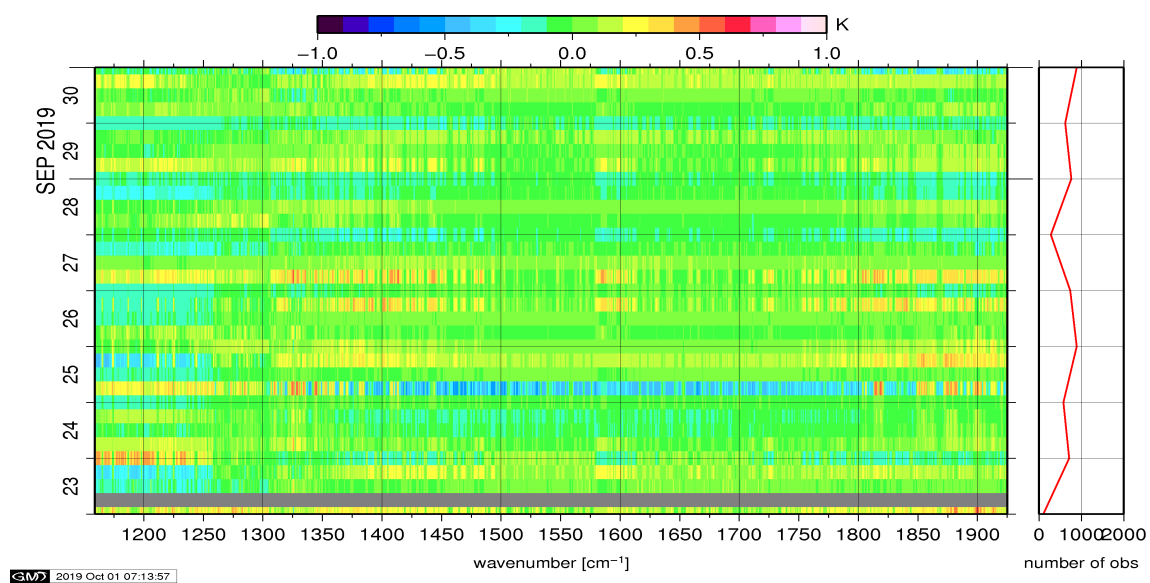Figure 11: Radiance Anomaly in BT: IASI Band 1

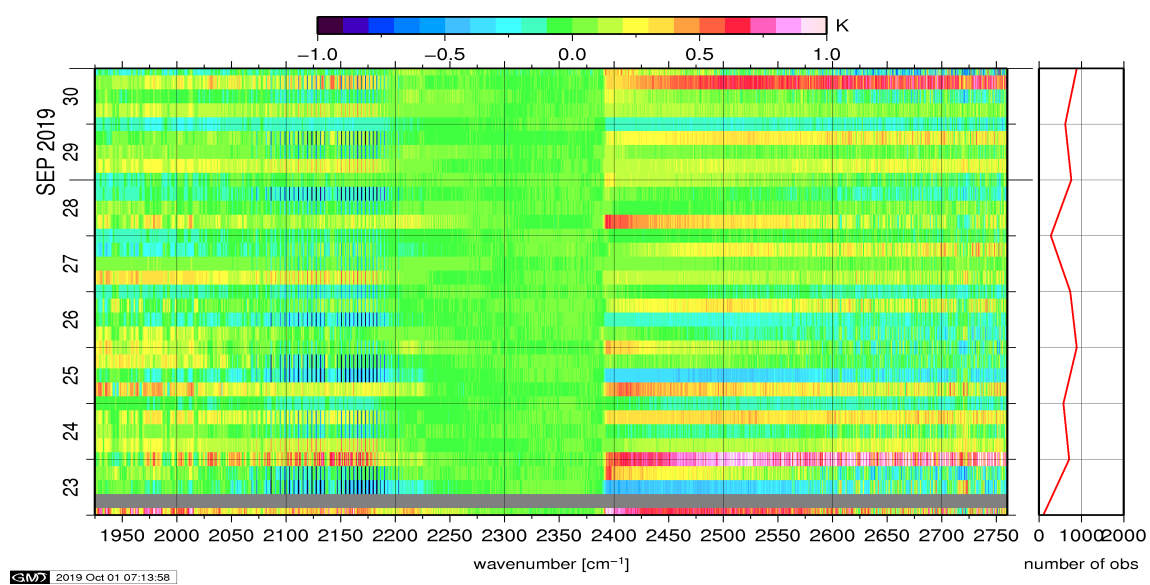Figure 12: Radiance Anomaly in BT: IASI Band 2
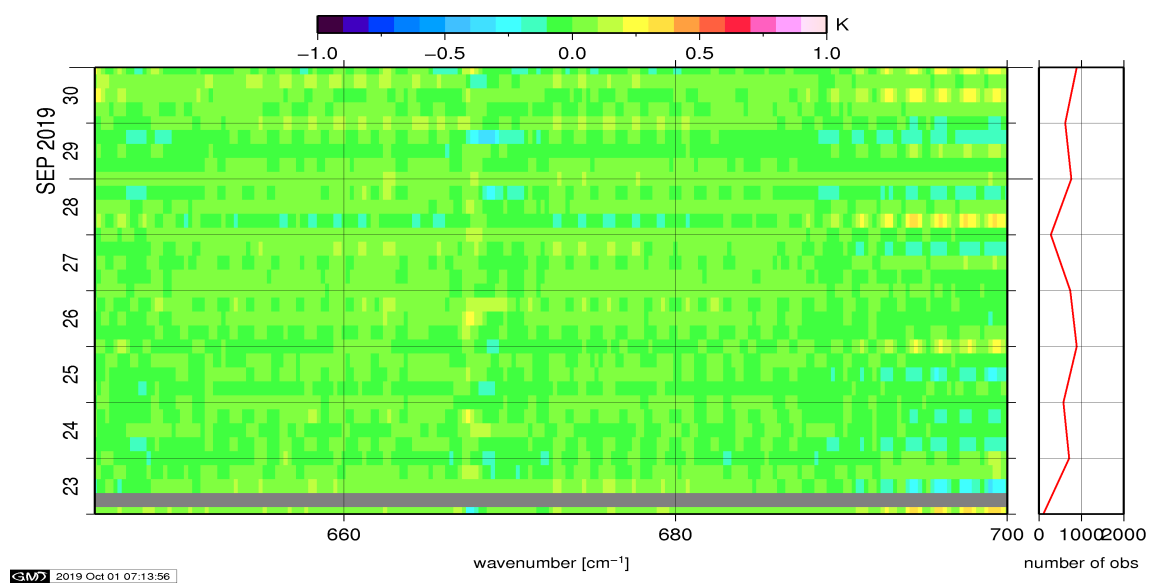

Figure 13: Radiance Anomaly in BT: IASI Band 3

Figure 14: Radiance Anomaly in BT: CO2 14

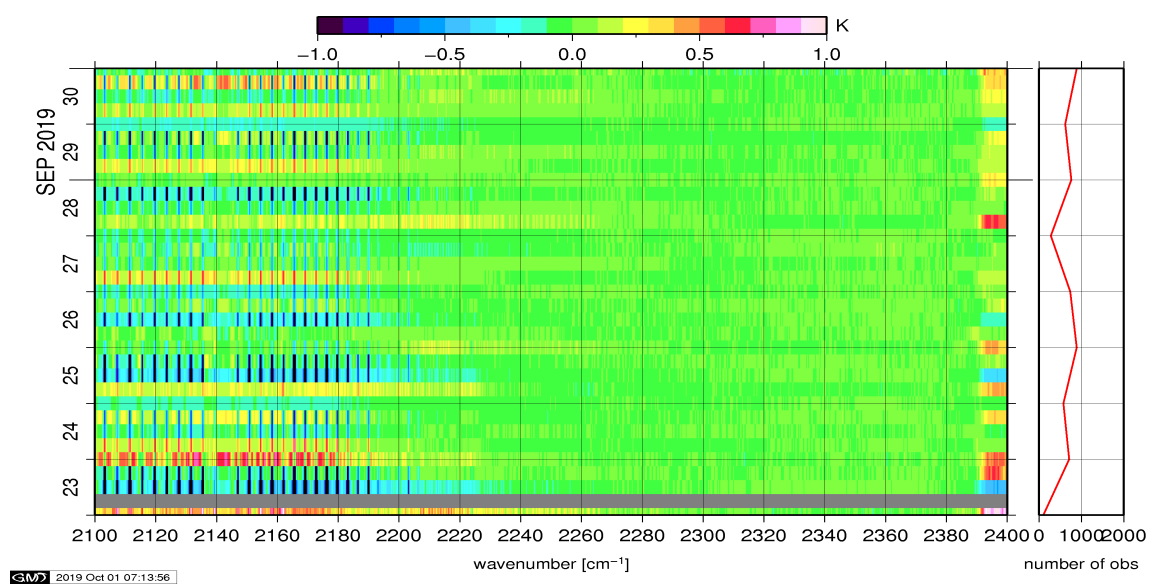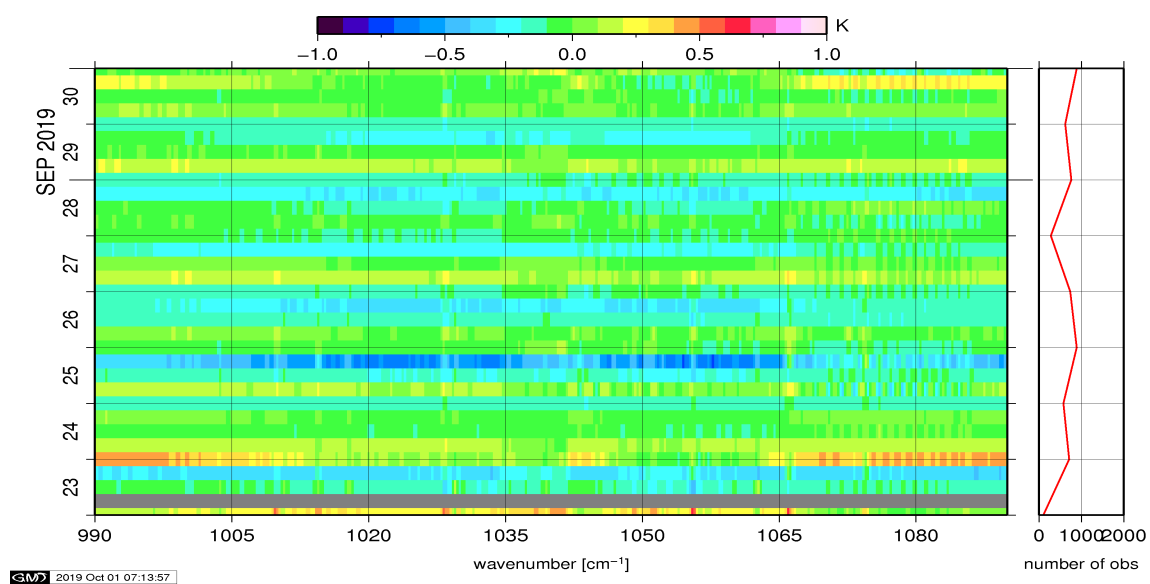Figure 15: Radiance Anomaly in BT: CO2 4.3

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.
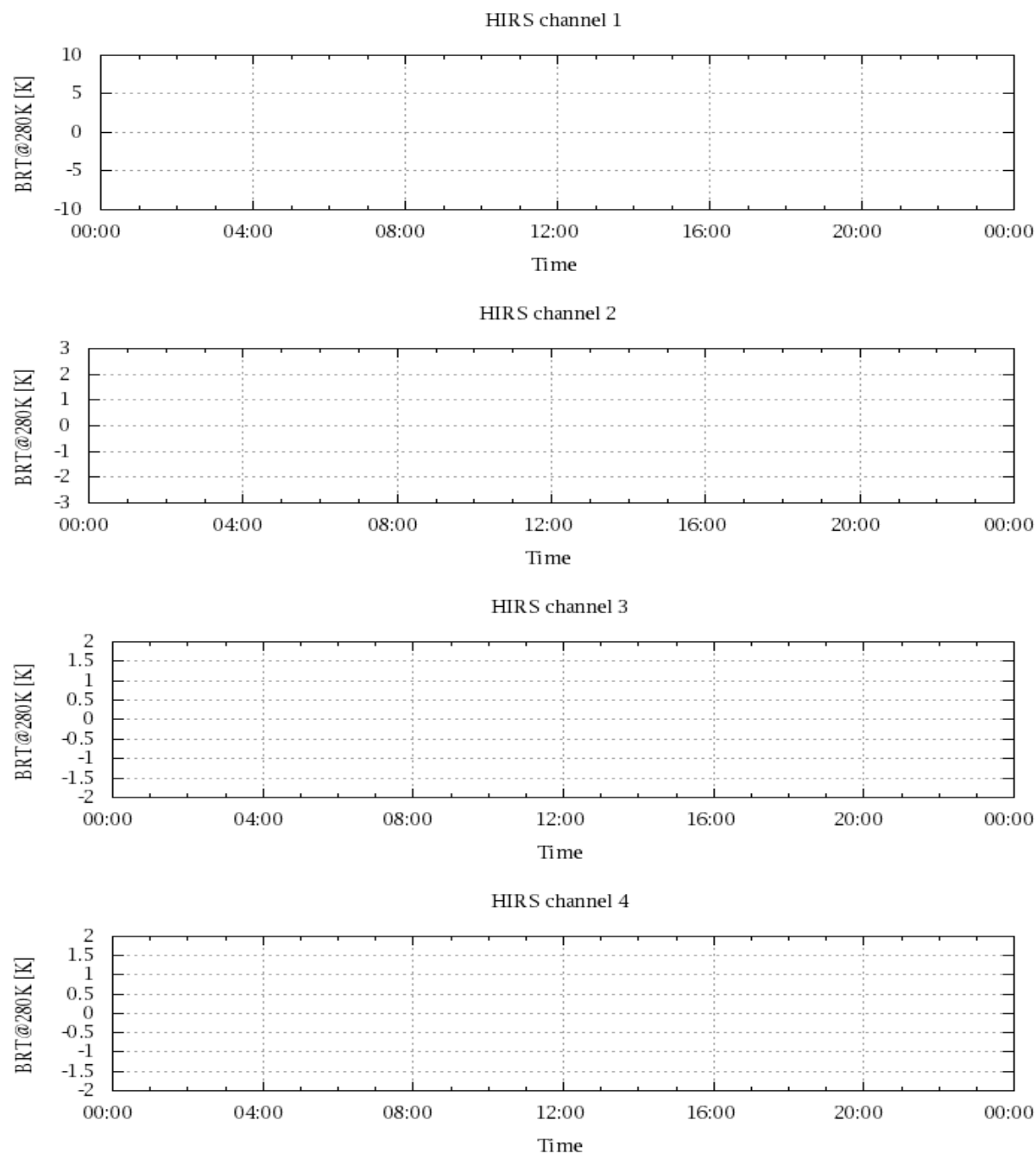

Figure 17: Radiance Differences in BT

HIRS channel 5

HIRS channel 6
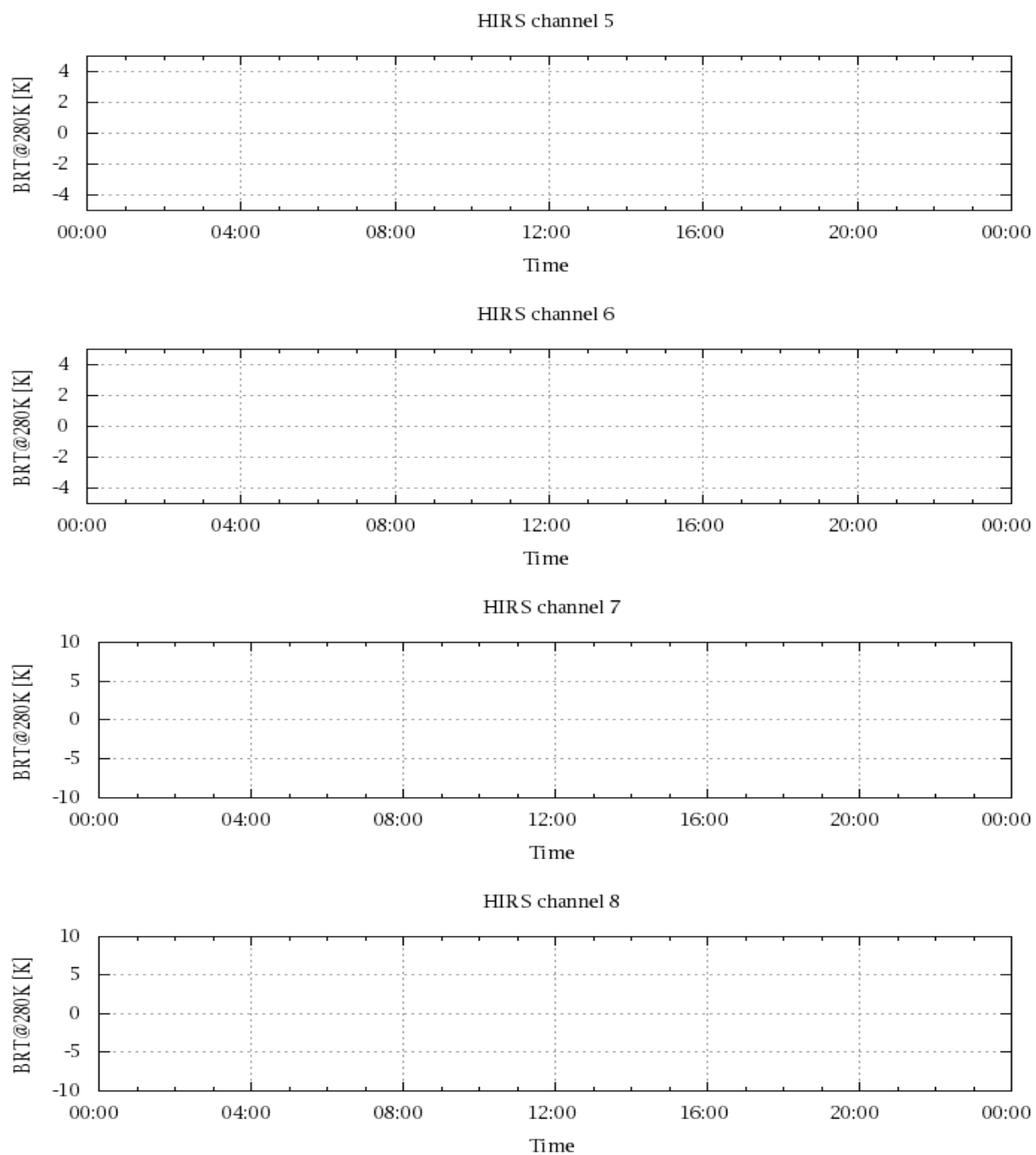
HIRS channel 7

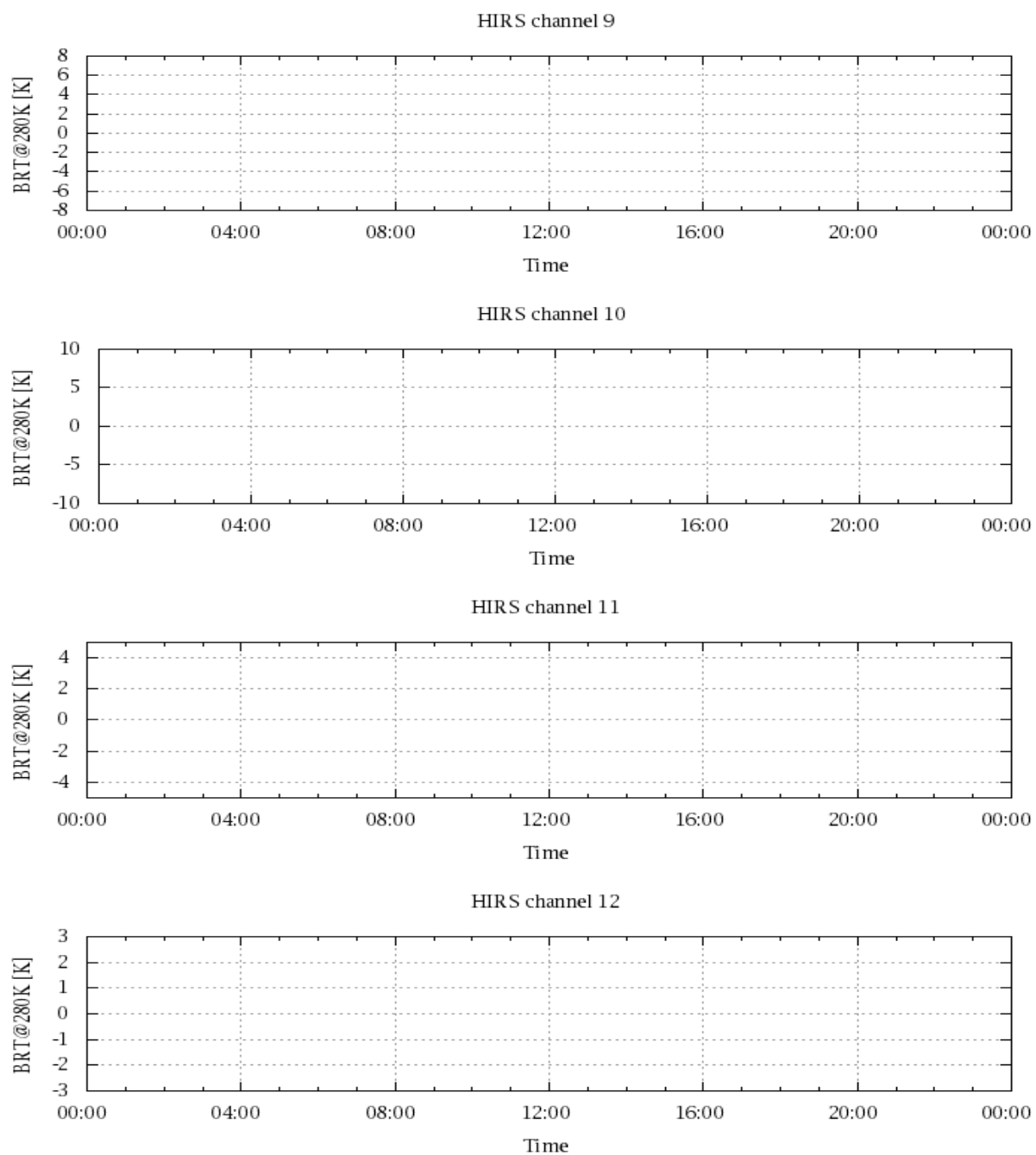HIRS channel 8

Figure 18: Radiance Differences in BT
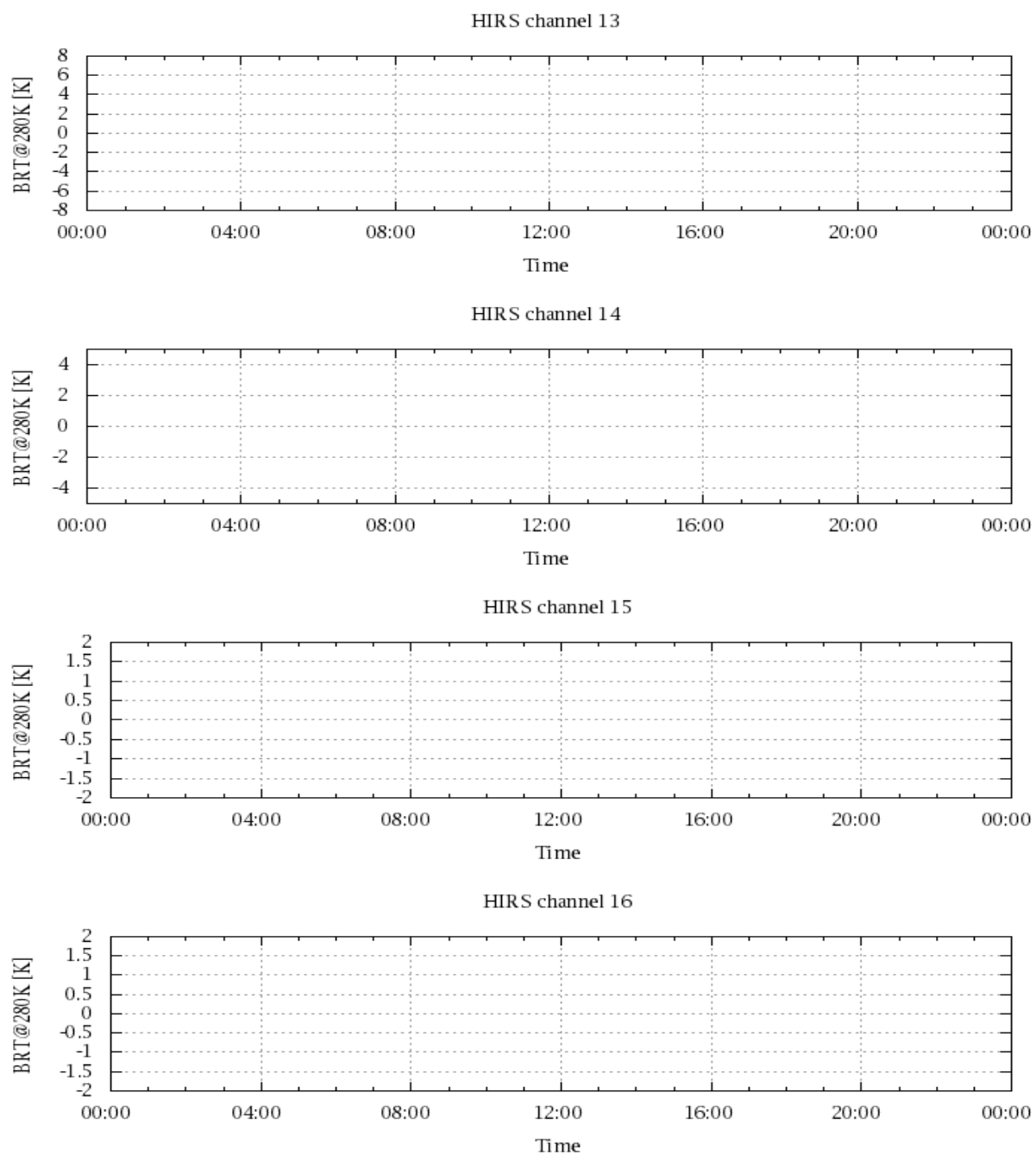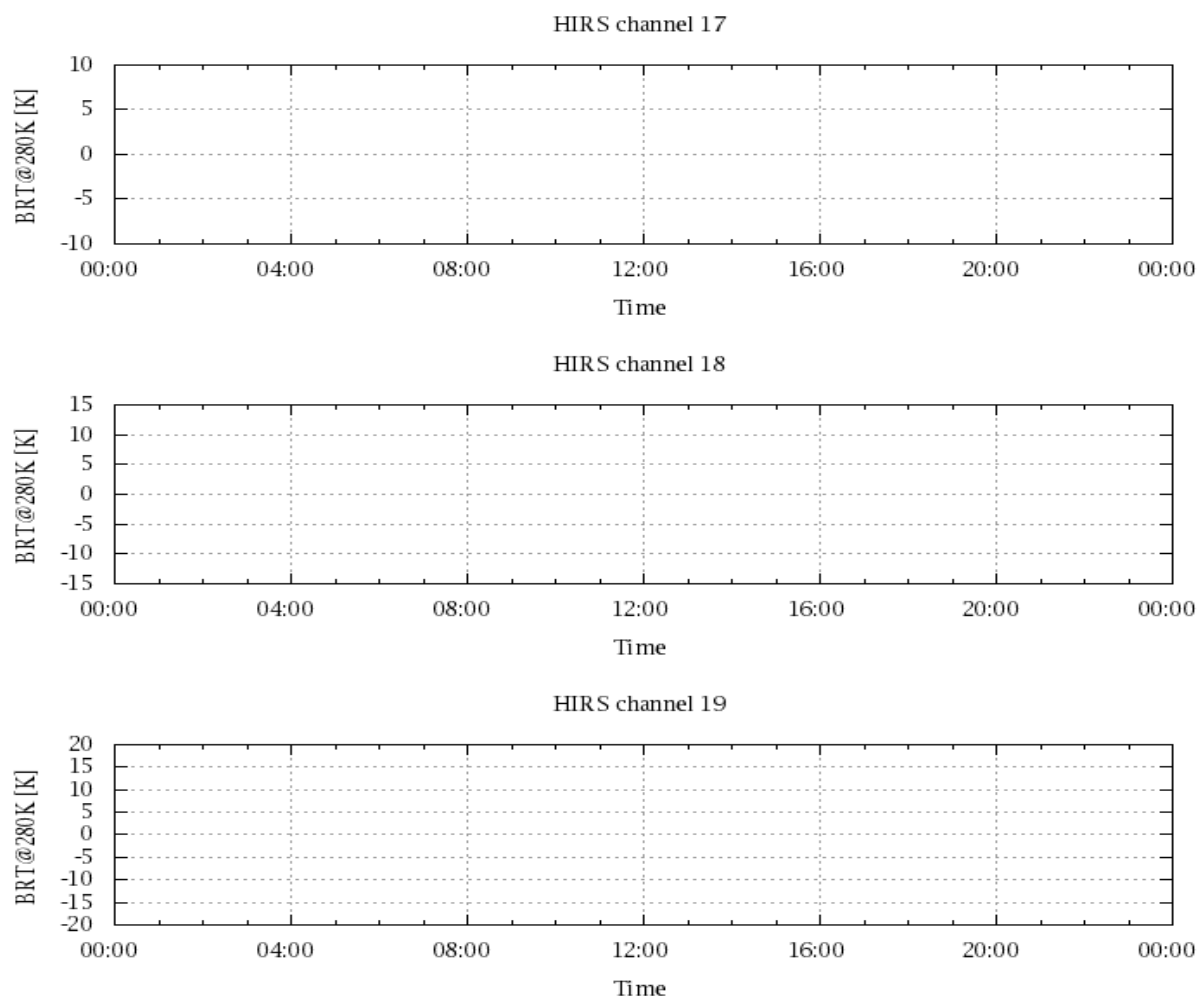
Figure 19: Radiance Differences in BT

Figure 20: Radiance Differences in BT

Figure 21: Radinace Differences in BT