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

IASI monitoring team

10/08/2023 00:00:00 - 11/08/2023 00:00:00

1 Introduction

This report provides summary monitoring plots and figures from IASI instrument on the Metop-B satellite retrieved from the IASI L0 and L1 ENG product (3 minutes data packet) for 10/08/2023 00:00:00 - 11/08/2023 00:00:00 .

The monitoring data are extracted on PDU basis.

2 Data quantity 10/08/2023 00:00:00 - 11/08/2023 00:00:00

Product Type	Number	Action
L0 HKTM PDUs	481	-
L0 IASI PDUs	428	e
L1 ENG PDUs	480	-
L1 ENG distinct GEPSGranule	481	-
L1 DPX PDUs (RM: IASI-HIRS)	0	e
L1 DPS Files (RM: OBS-CAL NWP based)	370	-

Table 1: Data quantity

APID	Seq from	Seq to	Time from	Time to
PX1 (130)	11087	14459	20230810005959.941	20230810011500.056
PX1 (130)	1453	14954	20230810012959.961	20230810023000.151
PX1 (130)	15624	1270	20230810023259.818	20230810024200.165
PX1 (130)	1940	1086	20230810024459.833	20230810035400.154
PX1 (130)	222	902	20230810050259.819	20230810050600.139
PX2 (135)	11087	14459	20230810005959.941	20230810011500.056
PX2 (135)	1453	14954	20230810012959.961	20230810023000.151
PX2 (135)	15624	1270	20230810023259.818	20230810024200.165
PX2 (135)	1940	1086	20230810024459.833	20230810035400.154
PX2 (135)	222	902	20230810050259.819	20230810050600.139
PX3 (140)	11087	14459	20230810005959.941	20230810011500.056
PX3 (140)	1453	14954	20230810012959.961	20230810023000.151
PX3 (140)	15624	1270	20230810023259.818	20230810024200.165
PX3 (140)	1940	1086	20230810024459.833	20230810035400.154
PX3 (140)	222	902	20230810050259.819	20230810050600.139
PX4 (145)	11087	14459	20230810005959.941	20230810011500.056
PX4 (145)	1453	14954	20230810012959.961	20230810023000.151
PX4 (145)	15624	1270	20230810023259.818	20230810024200.165
PX4 (145)	1940	1086	20230810024459.833	20230810035400.154

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Table 2 – continued from previous page

APID	Seq from	Seq to	Time from	Time to
PX4 (145)	222	902	20230810050259.819	20230810050600.139
IMG (150)	9975	13799	20230810005959.941	20230810011500.056
IMG (150)	1241	158	20230810012959.961	20230810023000.151
IMG (150)	920	3218	20230810023259.818	20230810024200.165
IMG (150)	3980	5194	20230810024459.833	20230810035400.154
IMG (150)	6402	7170	20230810050259.819	20230810050600.139
VER (160)	2711	3277	20230810005953.237	20230810011505.248
VER (160)	3836	6087	20230810012953.258	20230810023001.229
VER (160)	6201	6537	20230810023257.224	20230810024201.243
VER (160)	6651	9237	20230810024457.239	20230810035401.232
VER (160)	11826	11937	20230810050257.225	20230810050601.217
AUX (180)	3817	3931	20230810005953.667	20230810011505.677
AUX (180)	4042	4493	20230810012953.692	20230810023001.662
AUX (180)	4515	4583	20230810023257.654	20230810024201.677
AUX (180)	4605	5123	20230810024457.672	20230810035401.666
AUX (180)	5640	5663	20230810050257.659	20230810050601.651

Table 2: L0 data gaps

3 Instrument modes

Time	Transition from	Transition to
10/08/2023 00:00:06	-	Normal operation

Table 3: Instrument modes

4 L0 and L1 Data Quality

Flag	Value	Action
L0 IASI PDUs	428	e
L1 ENG PDUs	480	-
L1 ENG distinct GEPSGranule	481	-
GQisFlagQual set (PX1)	99.65 %	-
GQisFlagQual set (PX2)	99.72 %	-
GQisFlagQual set (PX3)	99.73 %	-
GQisFlagQual set (PX4)	99.64 %	-
GQisFlagQual set (all)	99.69 %	-

Table 4: Quality flags

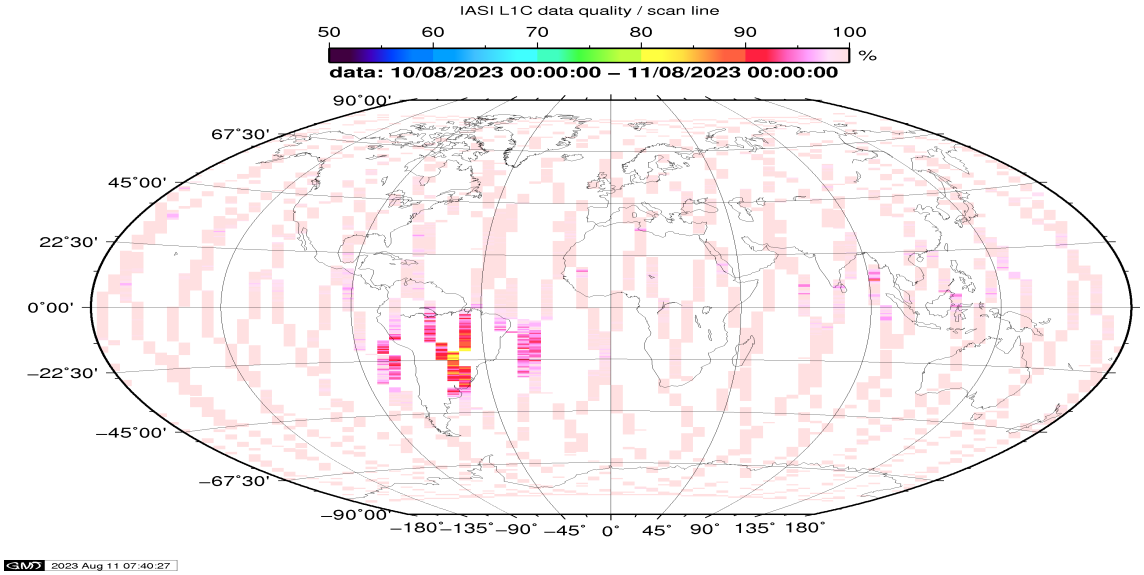

Figure 1: L1C data quality

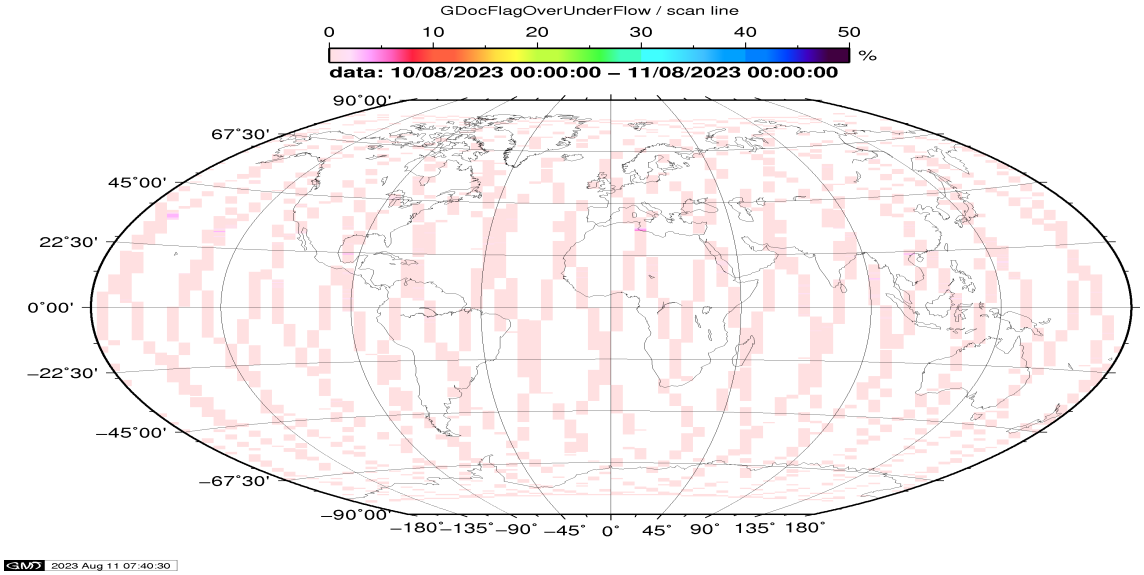

Figure 2: Flag of Over and Under Flows

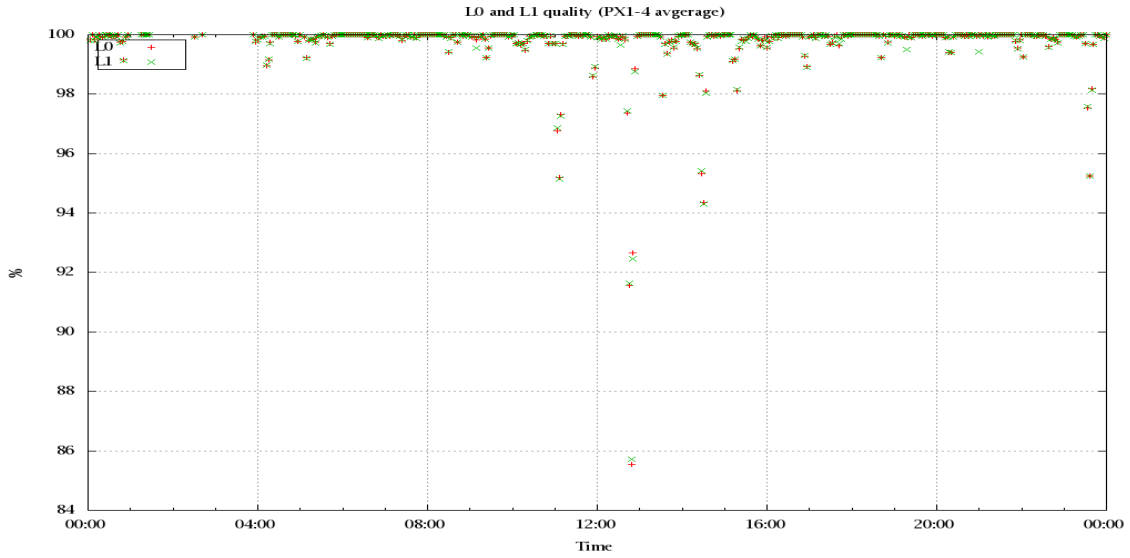

Figure 3: Level 0 and 1C overall quality

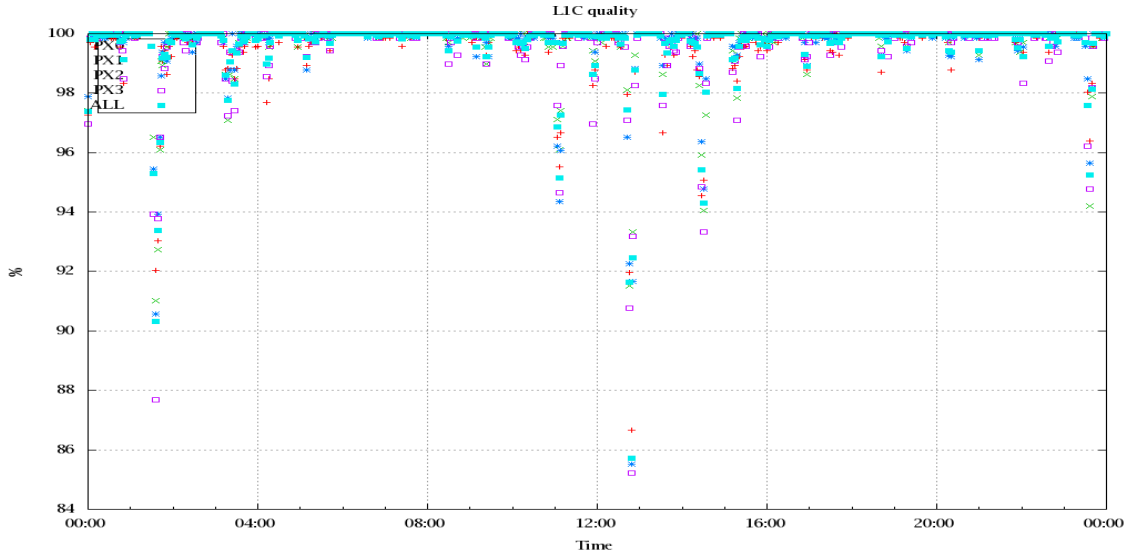

Figure 4: Level 1C quality

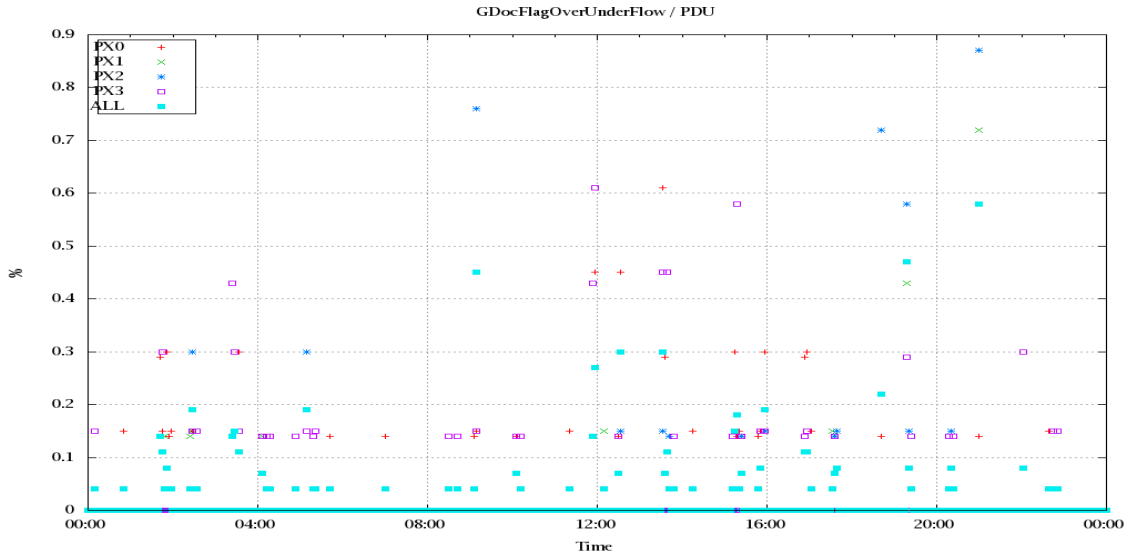

Figure 5: Timeseries of flag of Over and Under Flows

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.

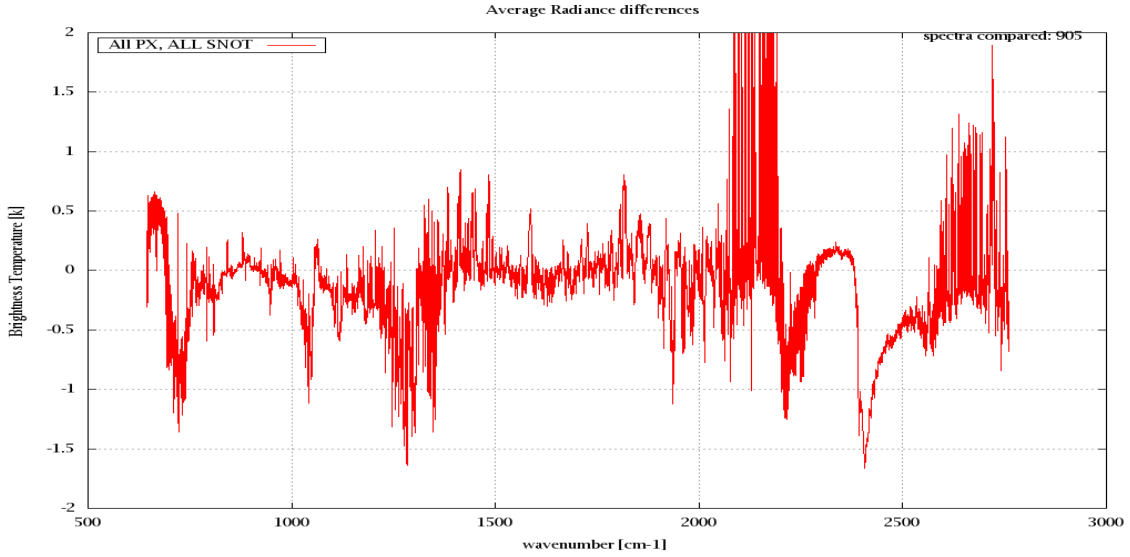

Figure 6: Average Radiance differences: OBS-CAL

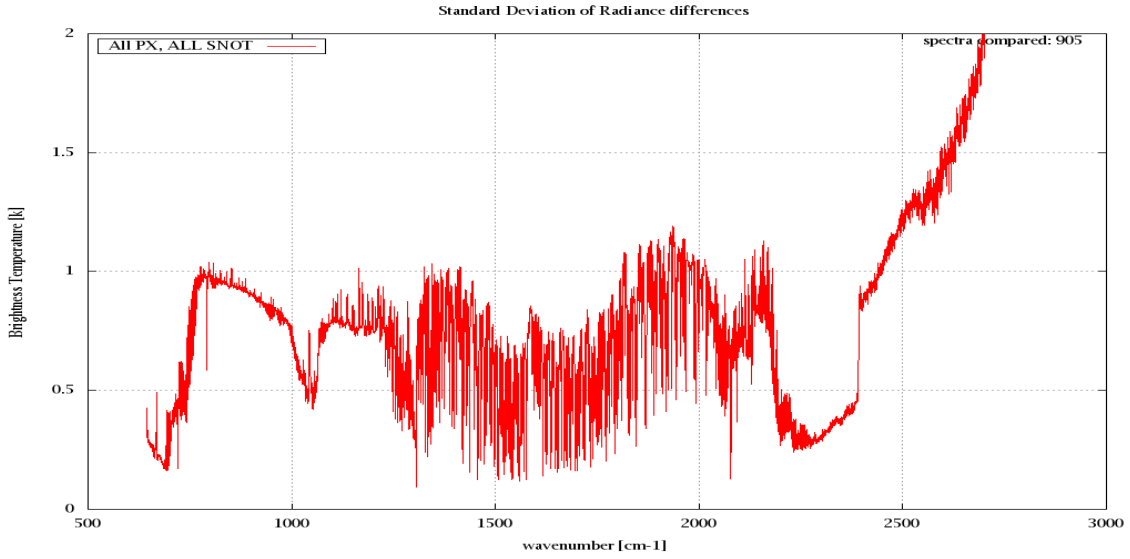

Figure 7: Standard Deviation of Radiance differences

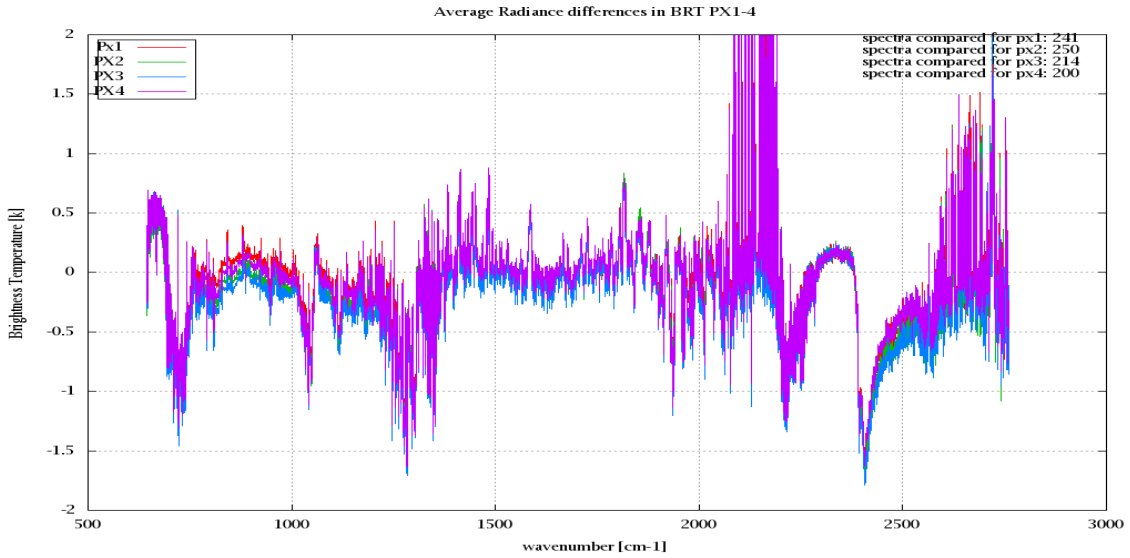

Figure 8: Average Radiance differences: OBS-CAL

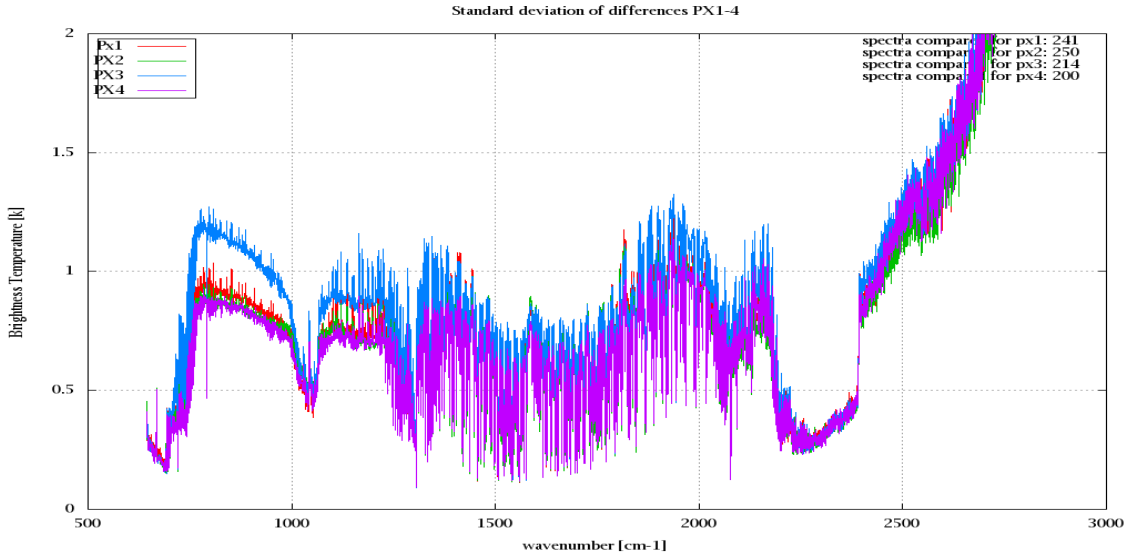

Figure 9: Standard Deviation of Radiance differences

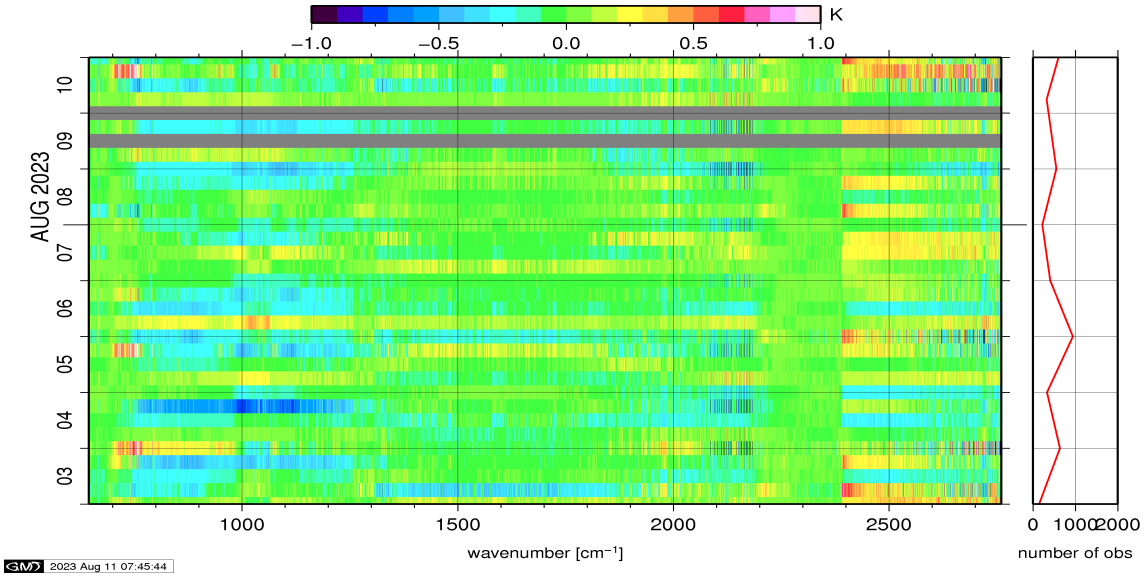

Figure 10: Radiance Anomaly in BT: All Channels

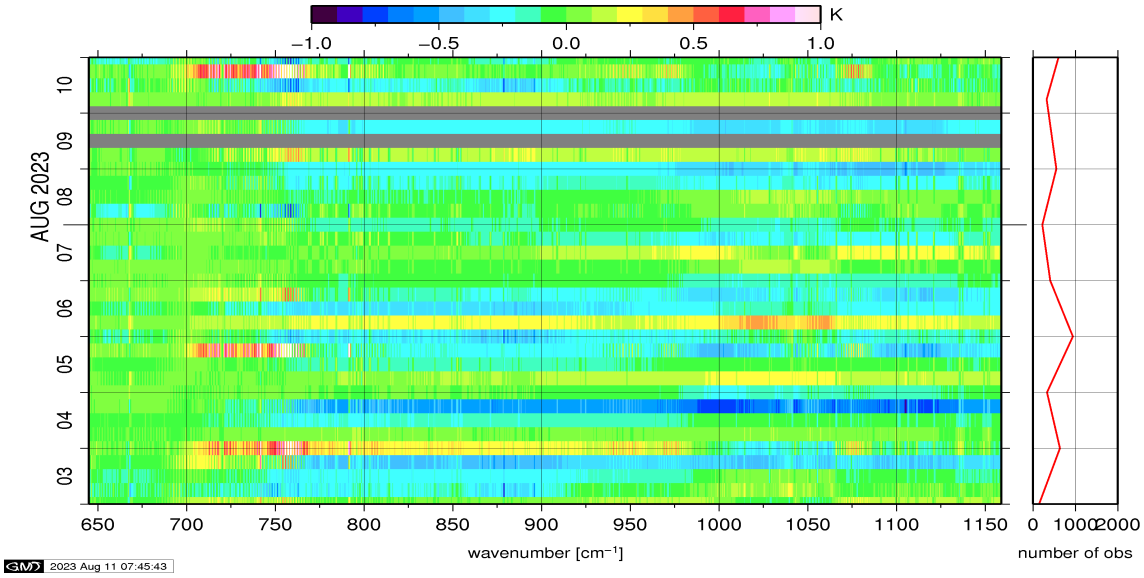

Figure 11: Radiance Anomaly in BT: IASI Band 1

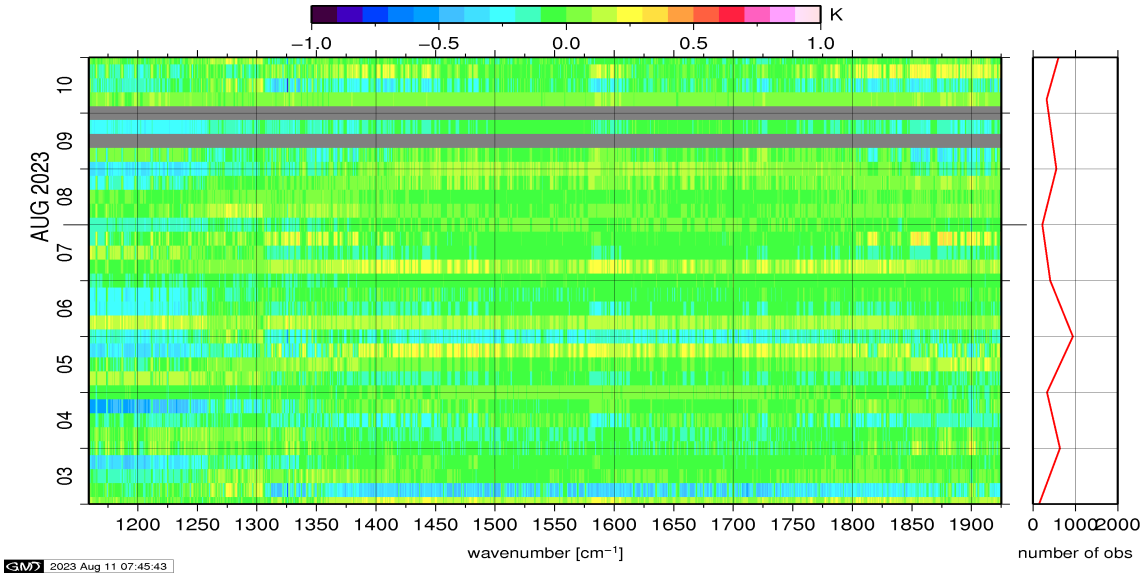

Figure 12: Radiance Anomaly in BT: IASI Band 2

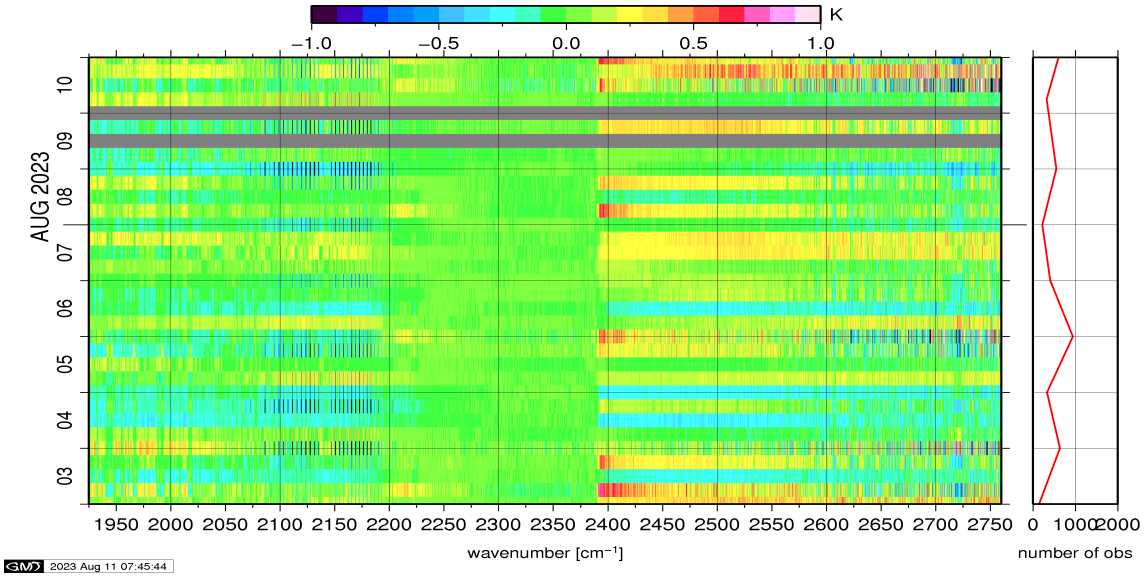

Figure 13: Radiance Anomaly in BT: IASI Band 3

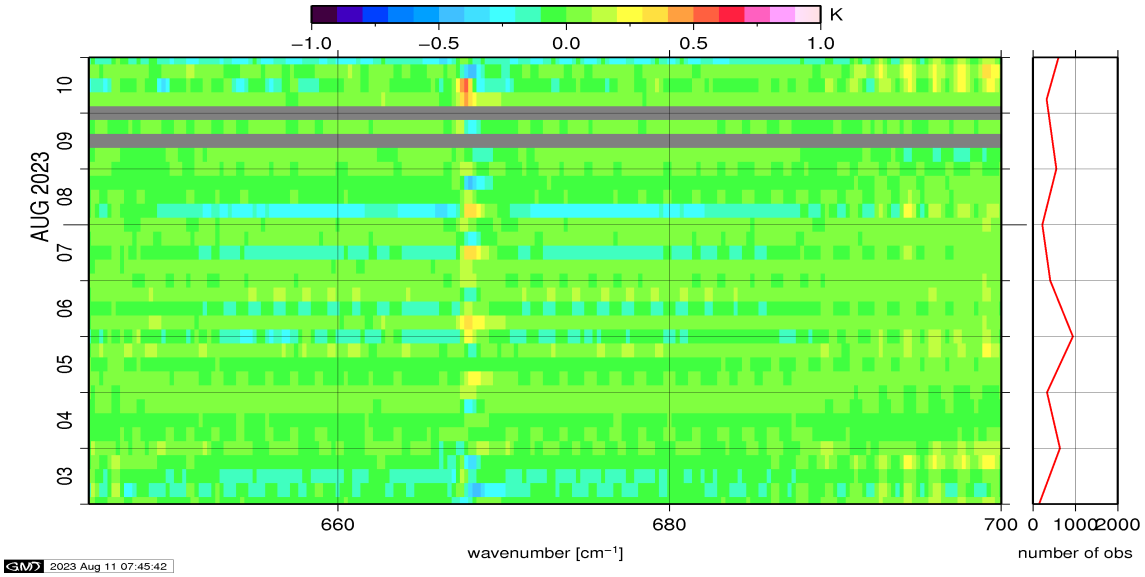

Figure 14: Radiance Anomaly in BT: CO2 14

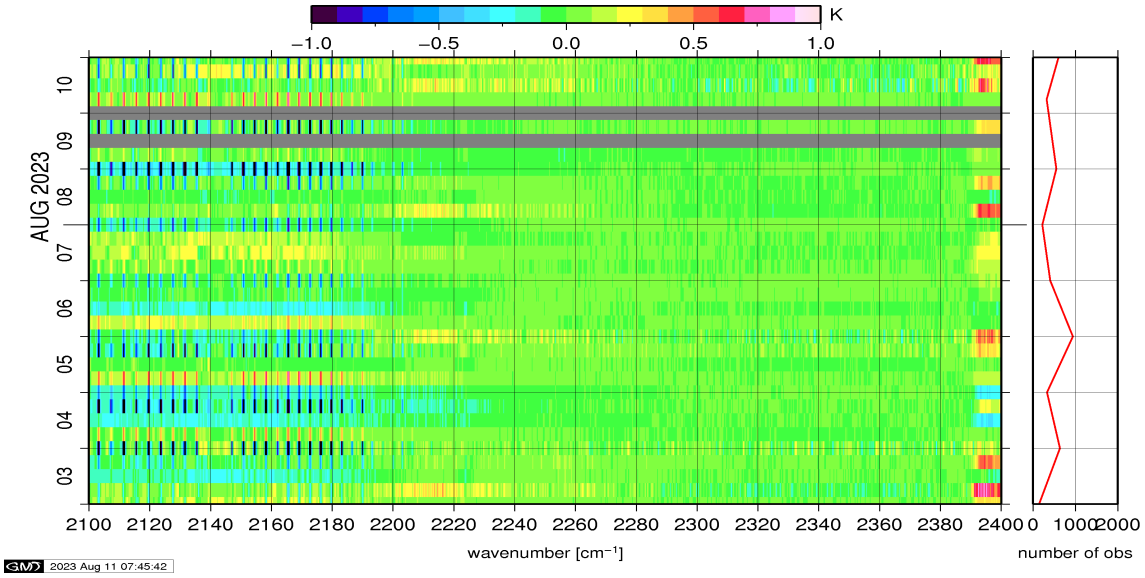

Figure 15: Radiance Anomaly in BT: CO2 4.3

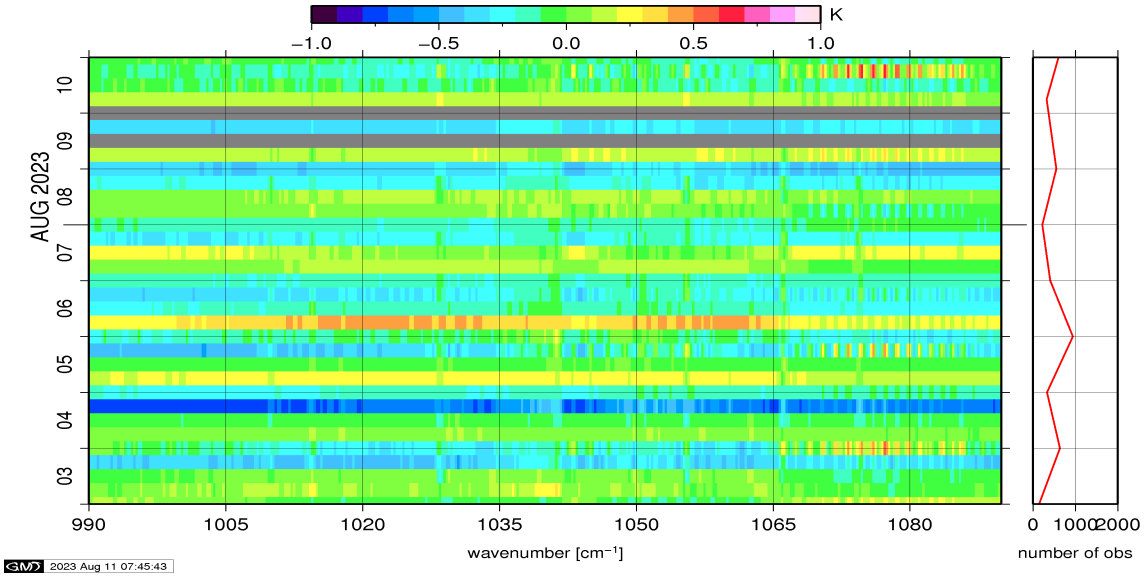

Figure 16: Radiance Anomaly in BT: O3

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.

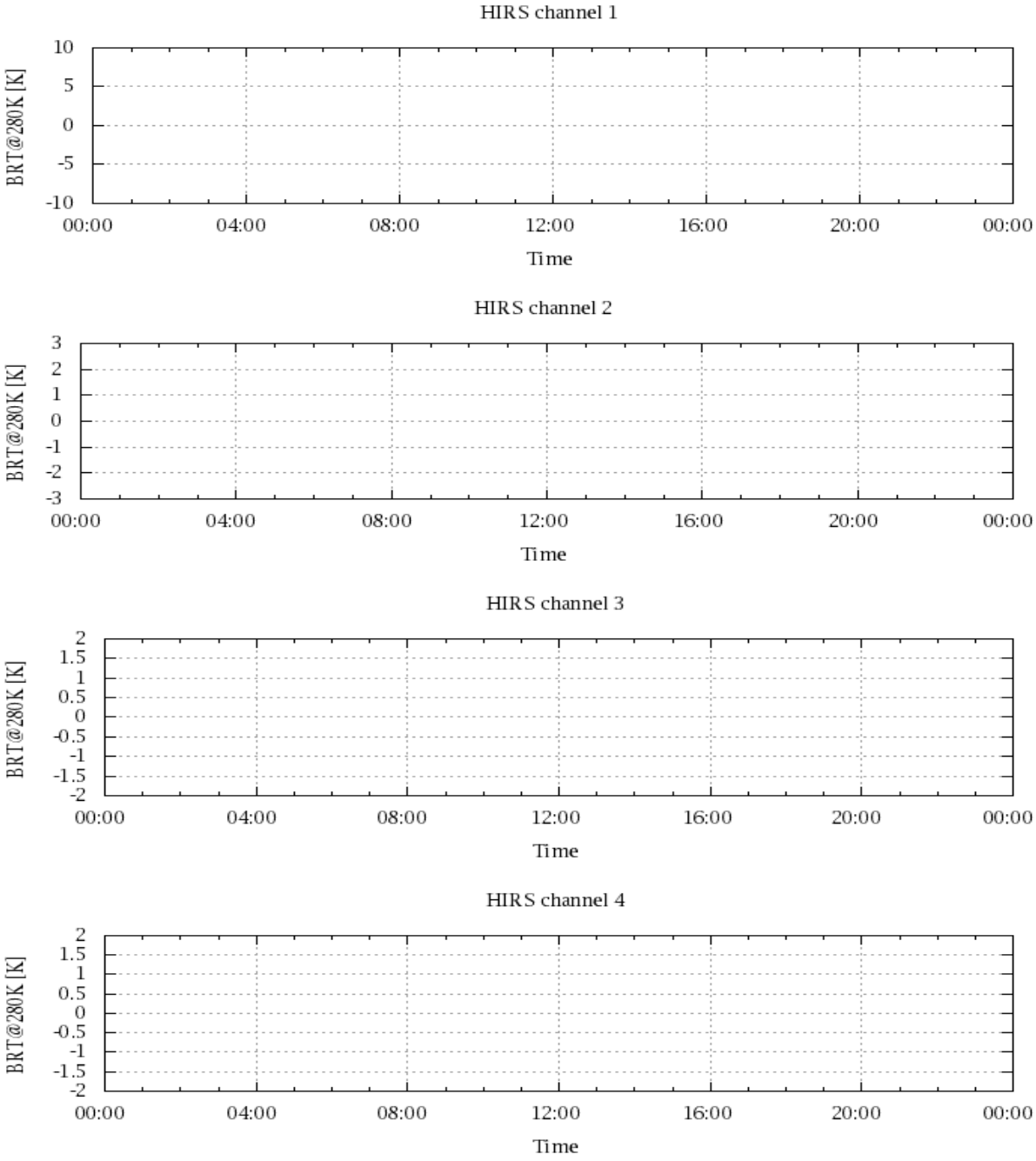

Figure 17: Radiance Differences in BT

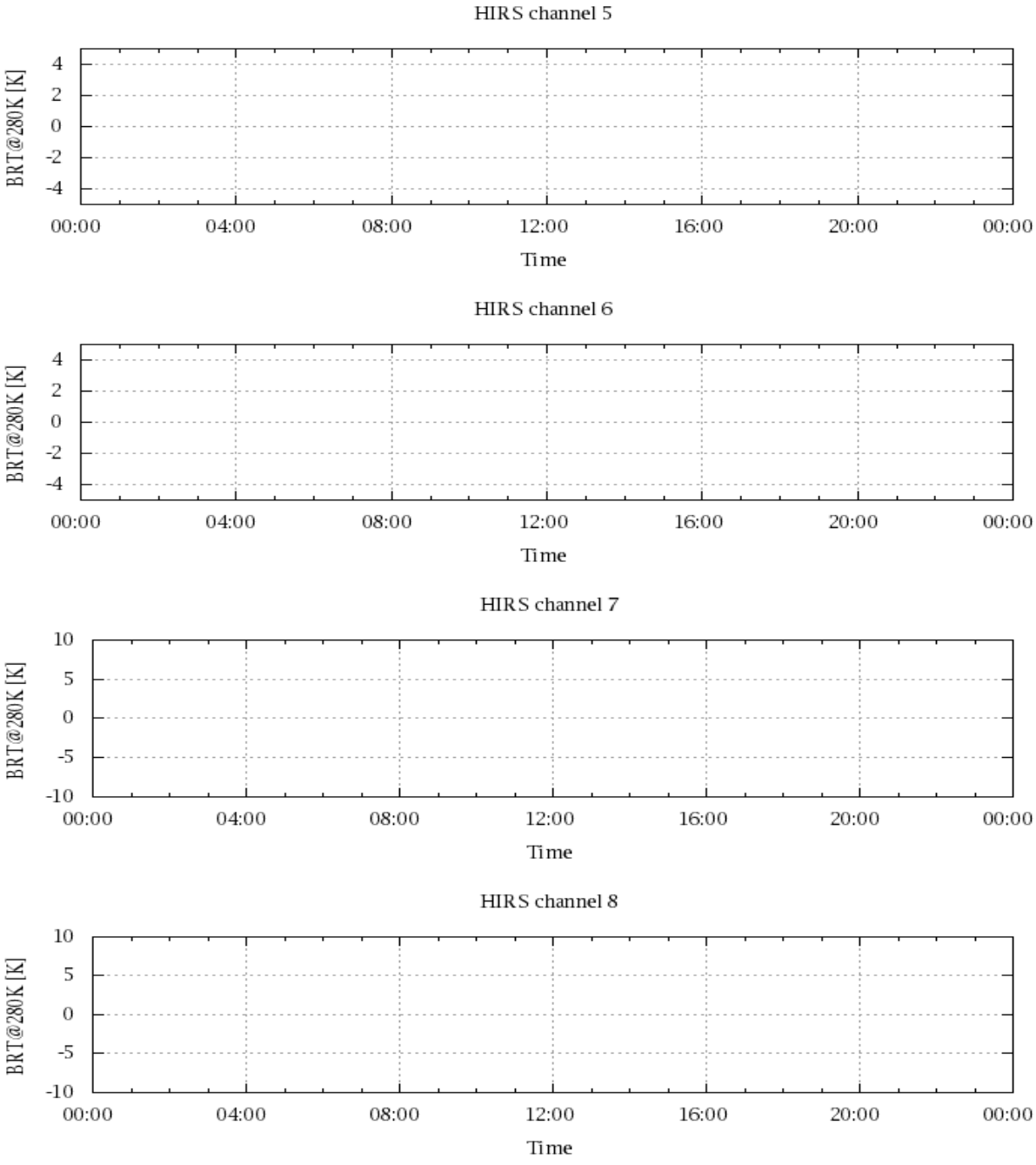

Figure 18: Radiance Differences in BT

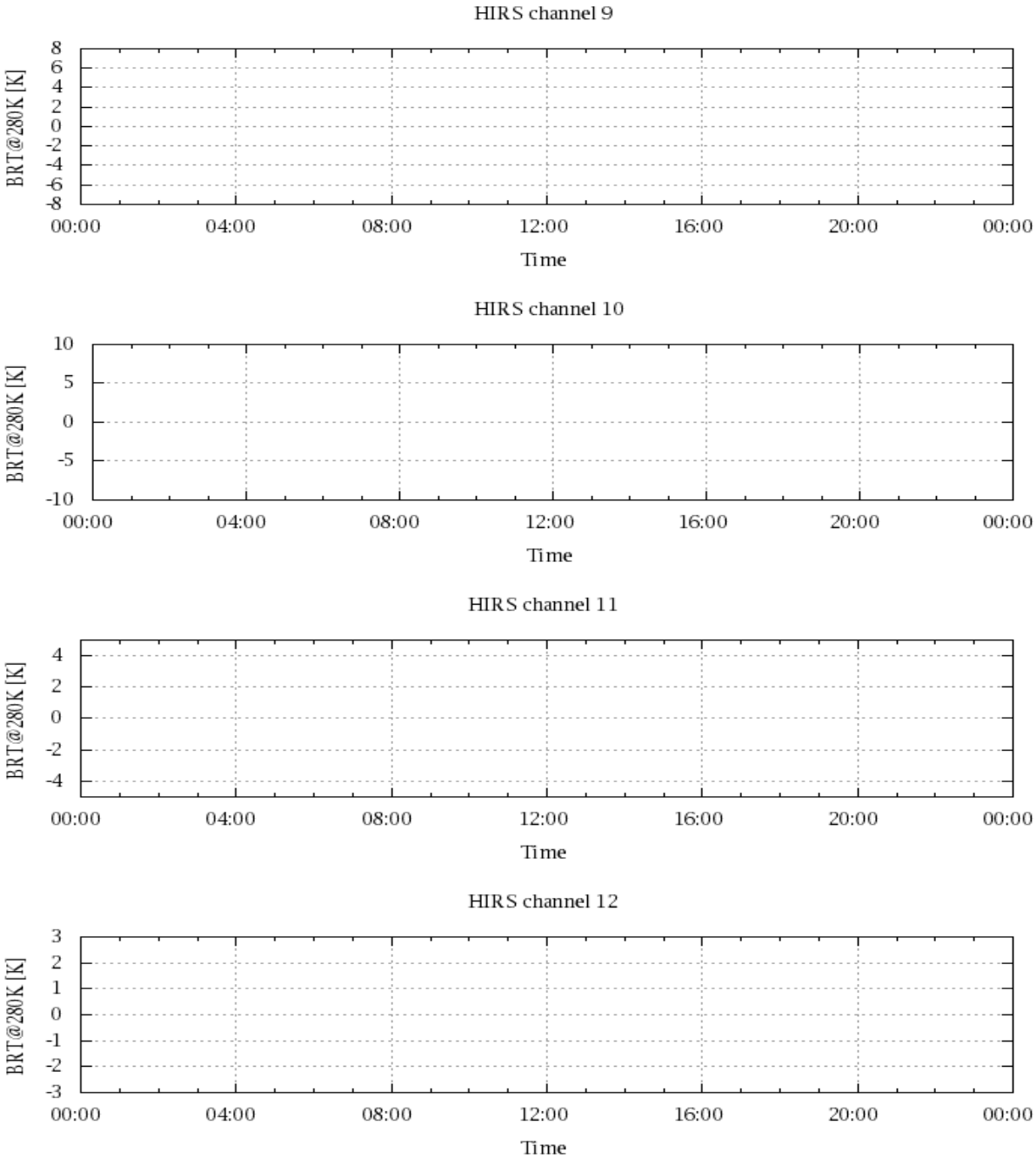

Figure 19: Radiance Differences in BT

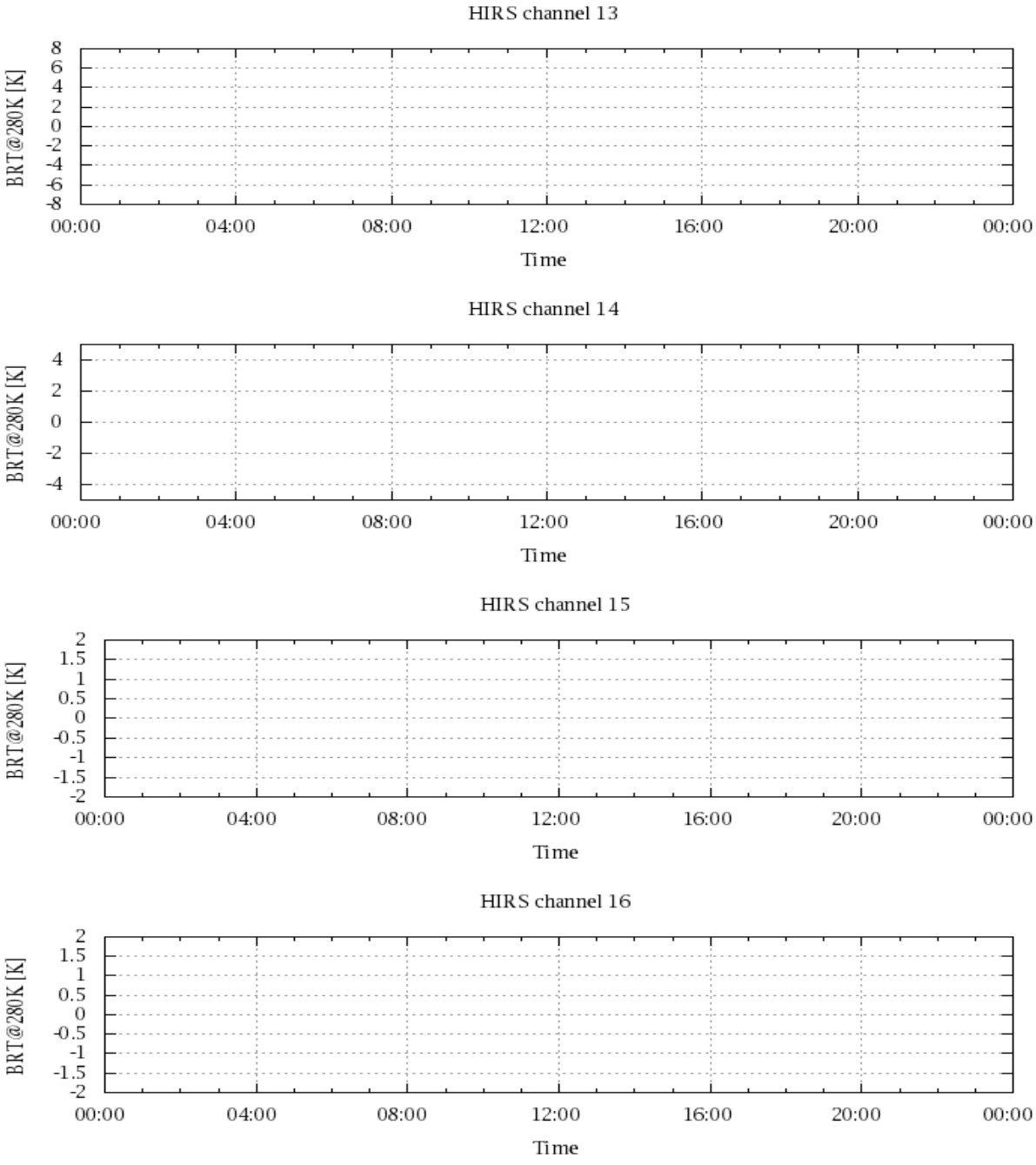

Figure 20: Radiance Differences in BT

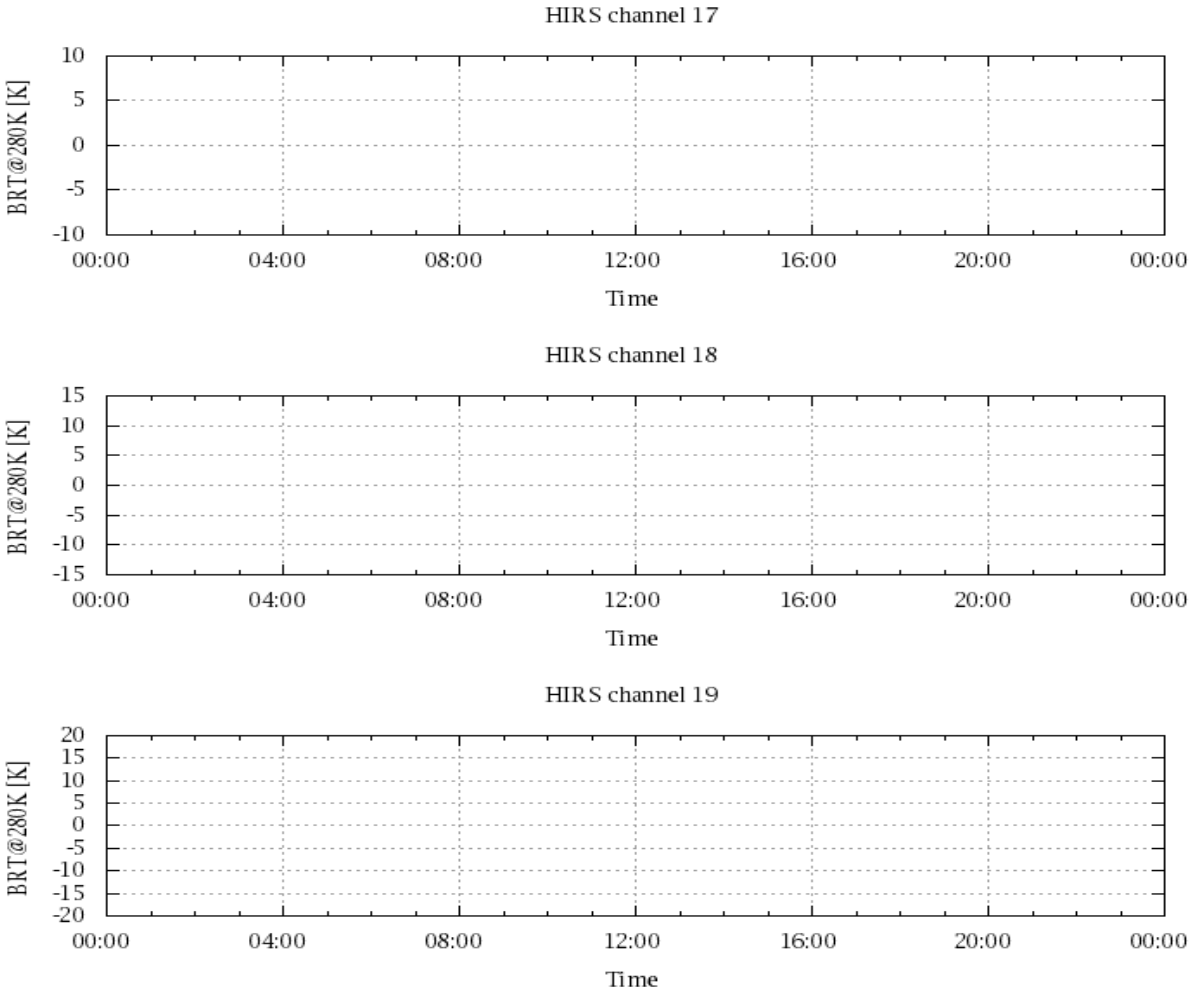

Figure 21: Radinace Differences in BT