

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

IASI monitoring team

14/03/2022 00:00:00 - 15/03/2022 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 14/03/2022 00:00:00 - 15/03/2022 00:00:00 .

The monitoring data are extracted on PDU basis.

2 Data quantity 14/03/2022 00:00:00 - 15/03/2022 00:00:00

Product Type	Number	Action
L0 HKTM PDUs	481	-
L0 IASI PDUs	259	e
L1 ENG PDUs	76	e
L1 ENG distinct GEPSGranule	74	a
L1 DPX PDUs (RM: IASI-HIRS)	0	e
L1 DPS Files (RM: OBS-CAL NWP based)	76	-

Table 1: Data quantity

APID	Seq from	Seq to	Time from	Time to
PX1 (130)	8251	0	20220314192340.147	20220314201709.889
PX2 (135)	8251	0	20220314192340.147	20220314201709.889
PX3 (140)	8251	0	20220314192340.147	20220314201709.889
PX3 (140)	1172	1174	20220314224800.049	20220314224800.482
PX4 (145)	8251	0	20220314192340.147	20220314201709.889
IMG (150)	8255	0	20220314192340.147	20220314201709.889
VER (160)	4101	2300	20220314192340.147	20220314211912.056
VER (160)	2300	2305	20220314211912.056	20220314211912.056
VER (160)	2305	2310	20220314211912.056	20220314211912.056
VER (160)	2310	2315	20220314211912.056	20220314211912.056
VER (160)	2315	2320	20220314211912.056	20220314211912.056
VER (160)	2320	2301	20220314211912.056	20220314211912.056
VER (160)	2301	2306	20220314211912.056	20220314211912.056
VER (160)	2306	2311	20220314211912.056	20220314211912.056
VER (160)	2311	2316	20220314211912.056	20220314211912.056
VER (160)	2316	2321	20220314211912.056	20220314211912.056
VER (160)	2321	2302	20220314211912.056	20220314211912.056

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Table 2 – continued from previous page

APID	Seq from	Seq to	Time from	Time to
VER (160)	2302	2307	20220314211912.056	20220314211912.056
VER (160)	2307	2312	20220314211912.056	20220314211912.056
VER (160)	2312	2317	20220314211912.056	20220314211912.056
VER (160)	2317	2322	20220314211912.056	20220314211912.056
VER (160)	2322	2303	20220314211912.056	20220314211912.056
VER (160)	2303	2308	20220314211912.056	20220314211912.056
VER (160)	2308	2313	20220314211912.056	20220314211912.056
VER (160)	2313	2318	20220314211912.056	20220314211912.056
VER (160)	2318	2323	20220314211912.056	20220314211912.056
VER (160)	2323	2304	20220314211912.056	20220314211912.056
VER (160)	2304	2309	20220314211912.056	20220314211912.056
VER (160)	2309	2314	20220314211912.056	20220314211912.056
VER (160)	2314	2319	20220314211912.056	20220314211912.056
VER (160)	2319	2324	20220314211912.056	20220314211912.056
AUX (180)	4096	0	20220314192332.581	20220314201716.592

Table 2: L0 data gaps

3 Instrument modes

Time	Transition from	Transition to
14/03/2022 00:00:09	-	Heater 2
14/03/2022 09:56:09	Heater 2	Auxiliary ASE synchronised
14/03/2022 10:17:13	Auxiliary ASE synchronised	Normal operation
14/03/2022 19:23:53	Normal operation	Auxiliary ASE synchronised
14/03/2022 19:24:57	Auxiliary ASE synchronised	Heater 2
14/03/2022 19:26:01	Heater 2	Heater 1 warm up
14/03/2022 19:26:49	Heater 1 warm up	Heater 2
14/03/2022 19:56:09	Heater 2	Auxiliary ASE synchronised
14/03/2022 20:17:13	Auxiliary ASE synchronised	Normal operation

Table 3: Instrument modes

4 L0 and L1 Data Quality

Flag	Value	Action
L0 IASI PDUs	259	e
L1 ENG PDUs	76	e
L1 ENG distinct GEPSGranule	74	a
GQisFlagQual set (PX1)	99.36 %	-
GQisFlagQual set (PX2)	99.46 %	-
GQisFlagQual set (PX3)	99.46 %	-
GQisFlagQual set (PX4)	99.43 %	-
GQisFlagQual set (all)	99.42 %	-

Table 4: Quality flags

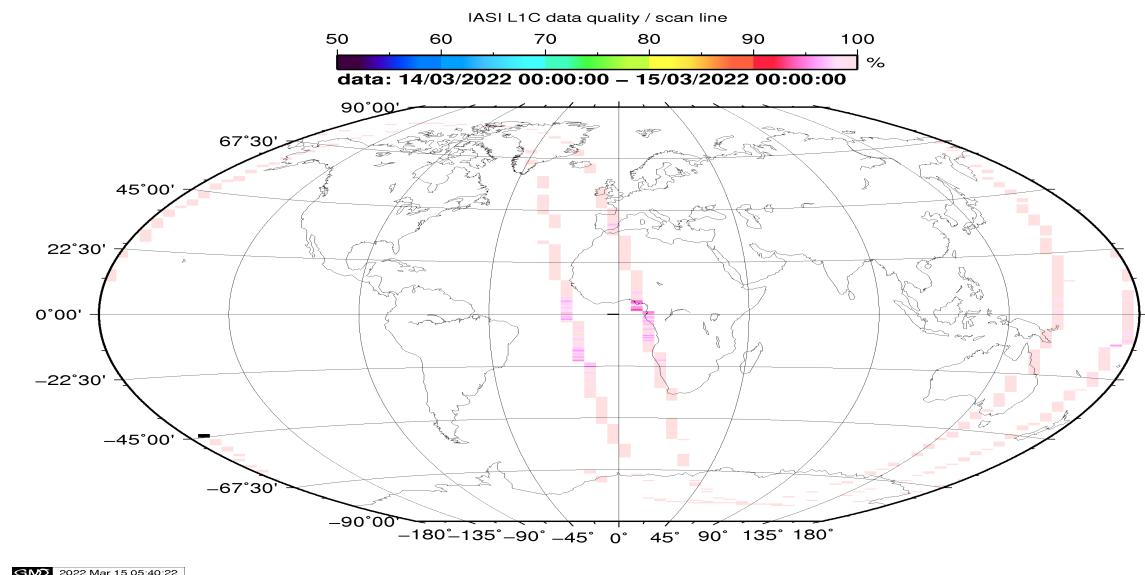


Figure 1: L1C data quality

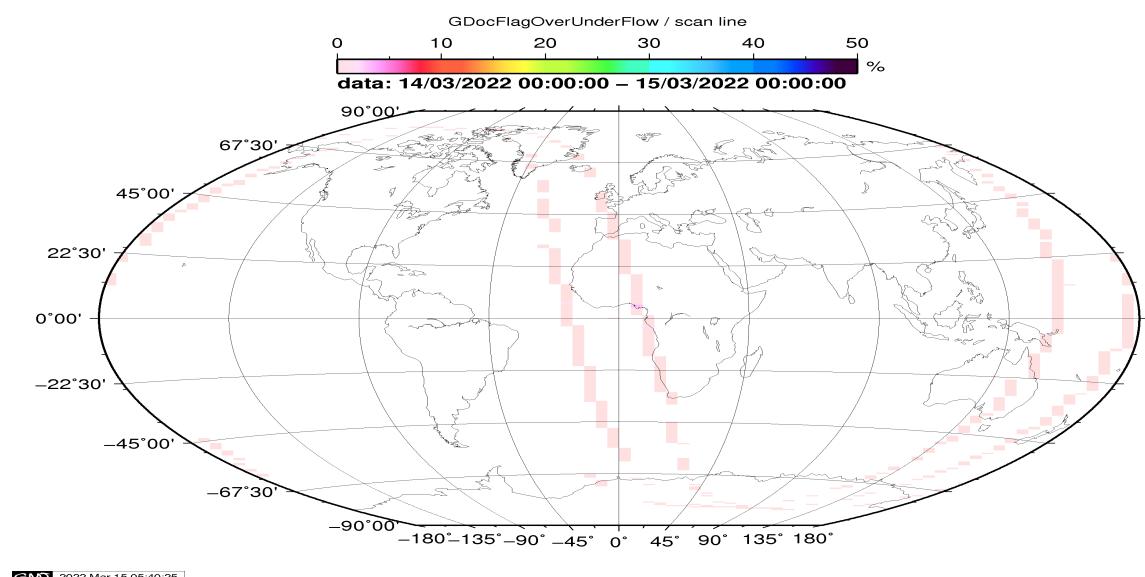


Figure 2: Flag of Over and Under Flows

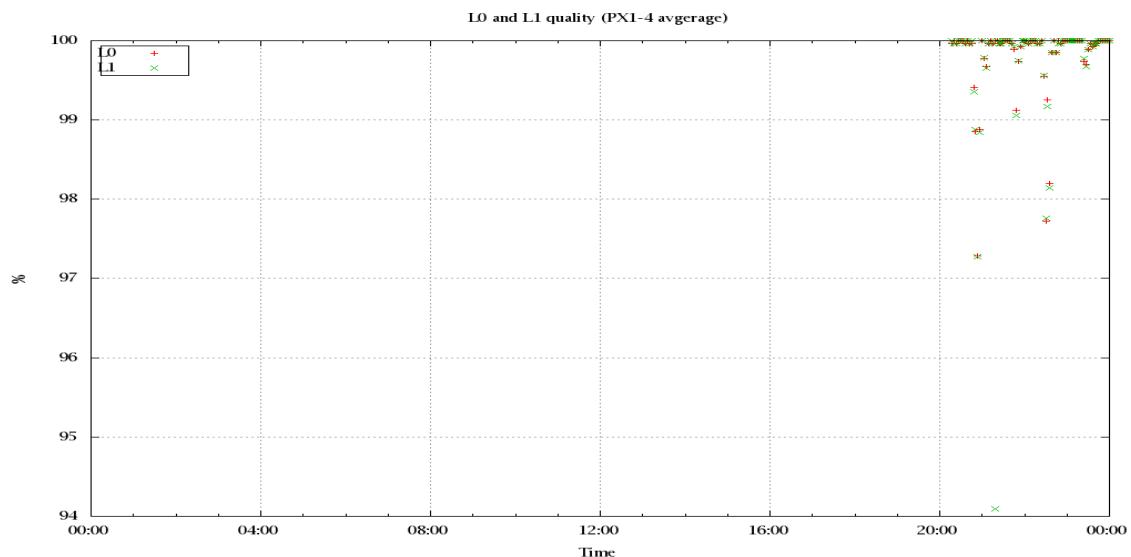


Figure 3: Level 0 and 1C overall quality

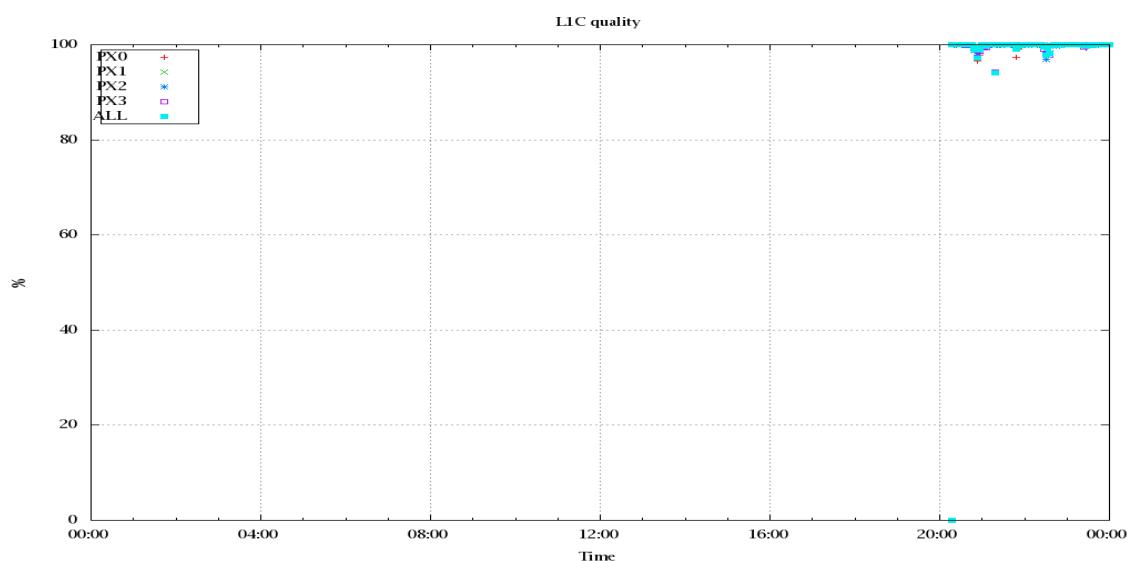


Figure 4: Level 1C quality

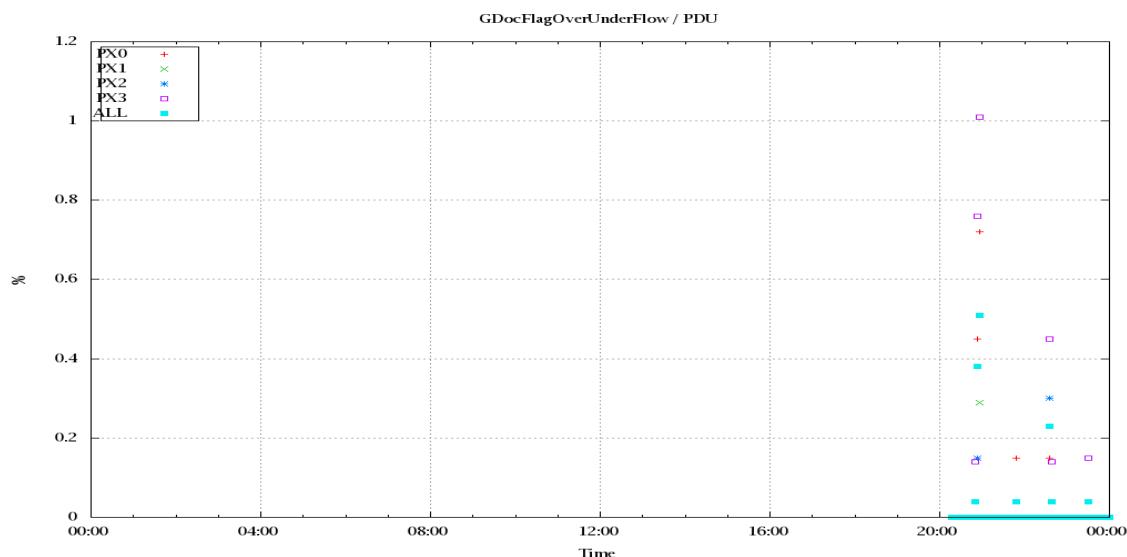


Figure 5: Timeseries of flag of Over and Under Flows

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.

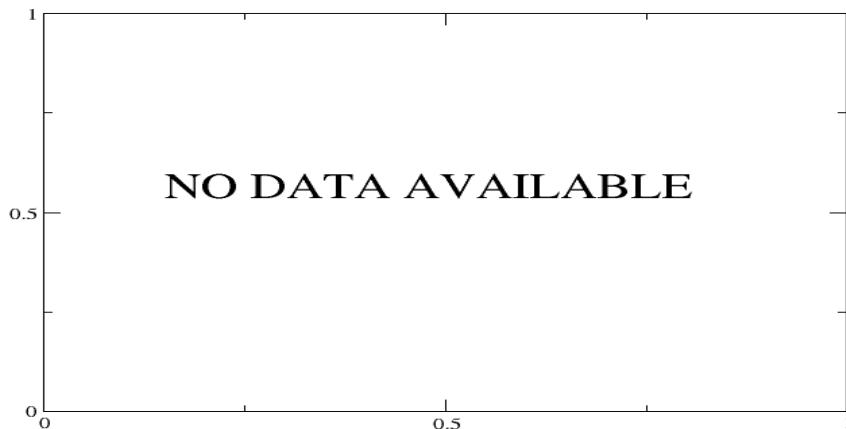


Figure 6: Average Radiance differences: OBS-CAL

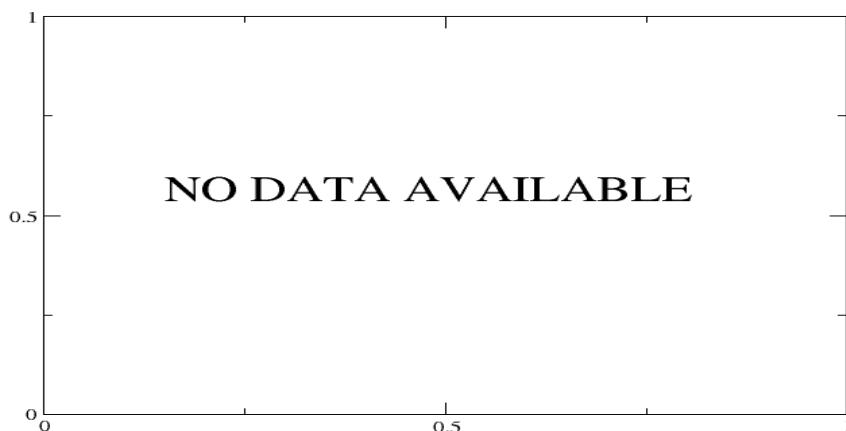


Figure 7: Standard Deviation of Radiance differences

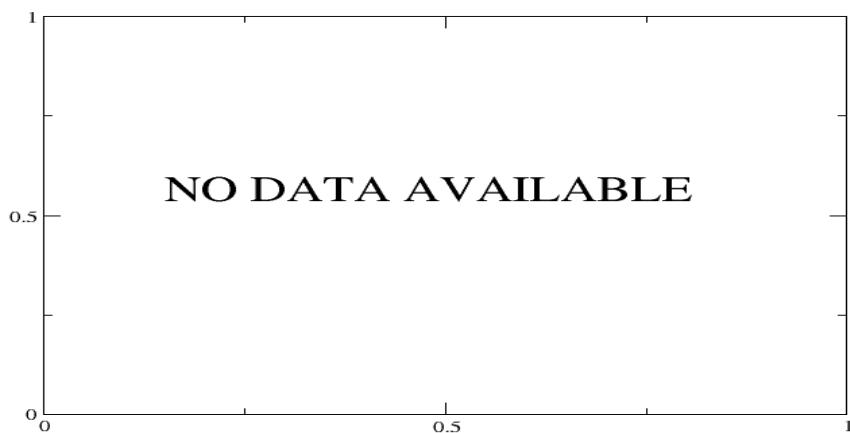


Figure 8: Average Radiance differences: OBS-CAL

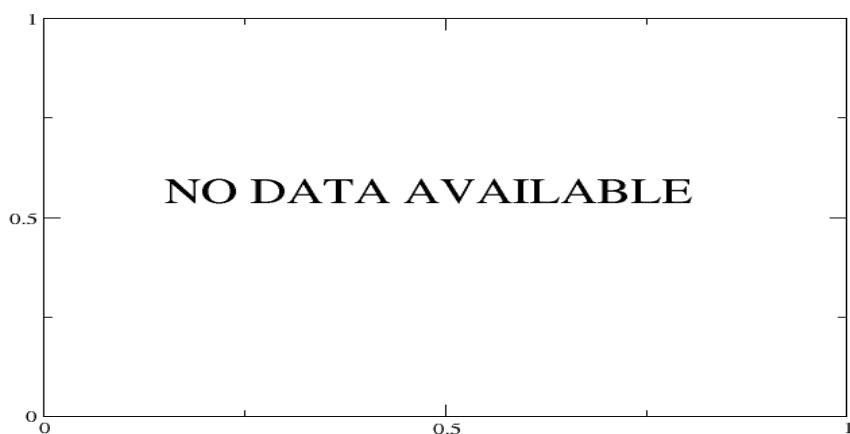


Figure 9: Standard Deviation of Radiance differences

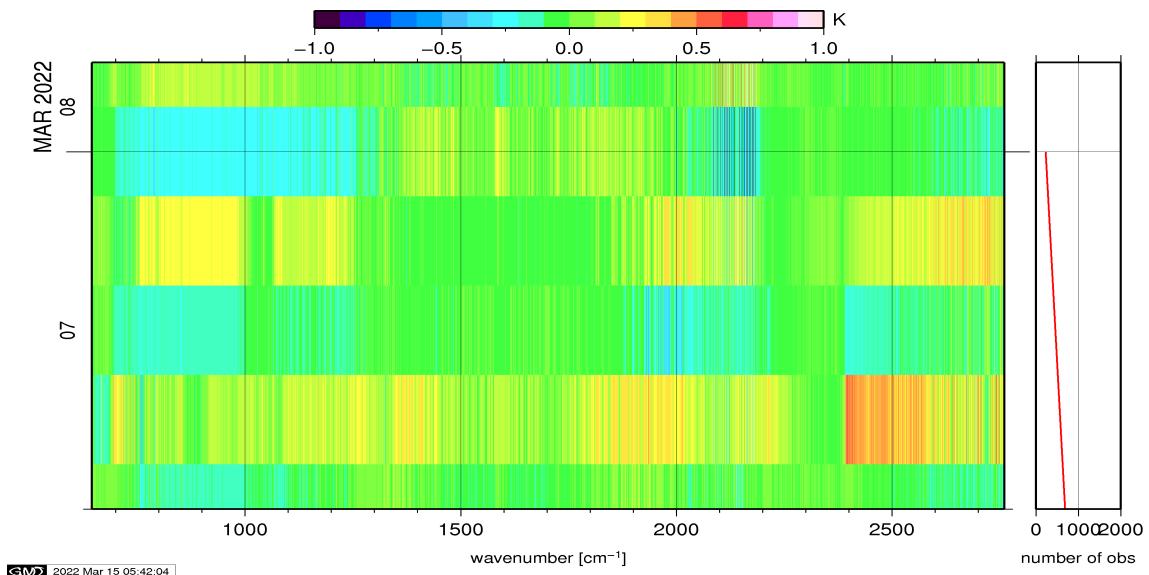


Figure 10: Radiance Anomaly in BT: All Channels

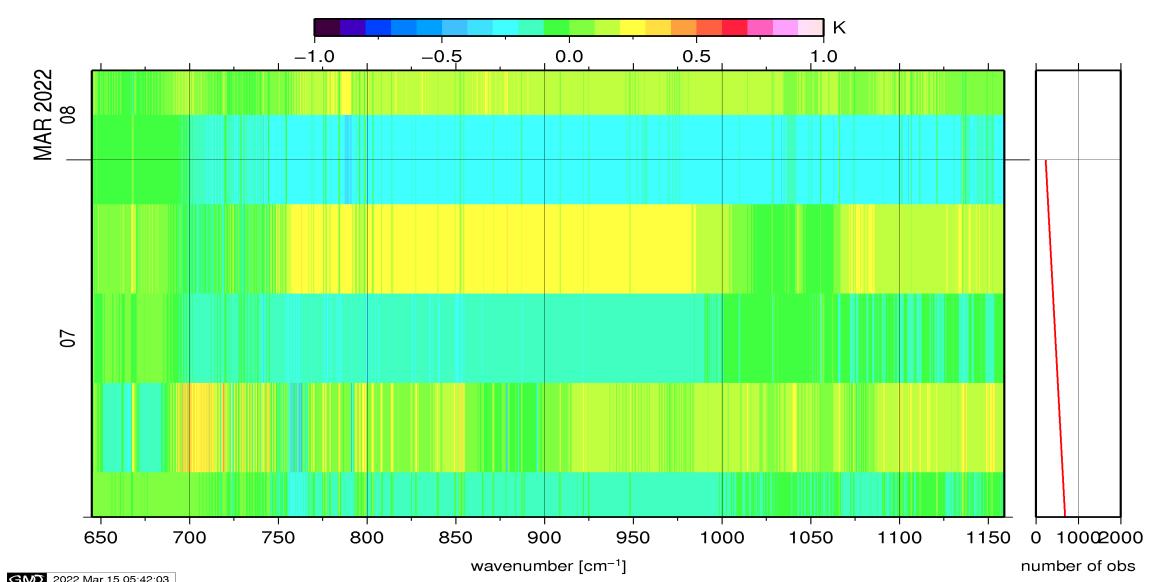


Figure 11: Radiance Anomaly in BT: IASI Band 1

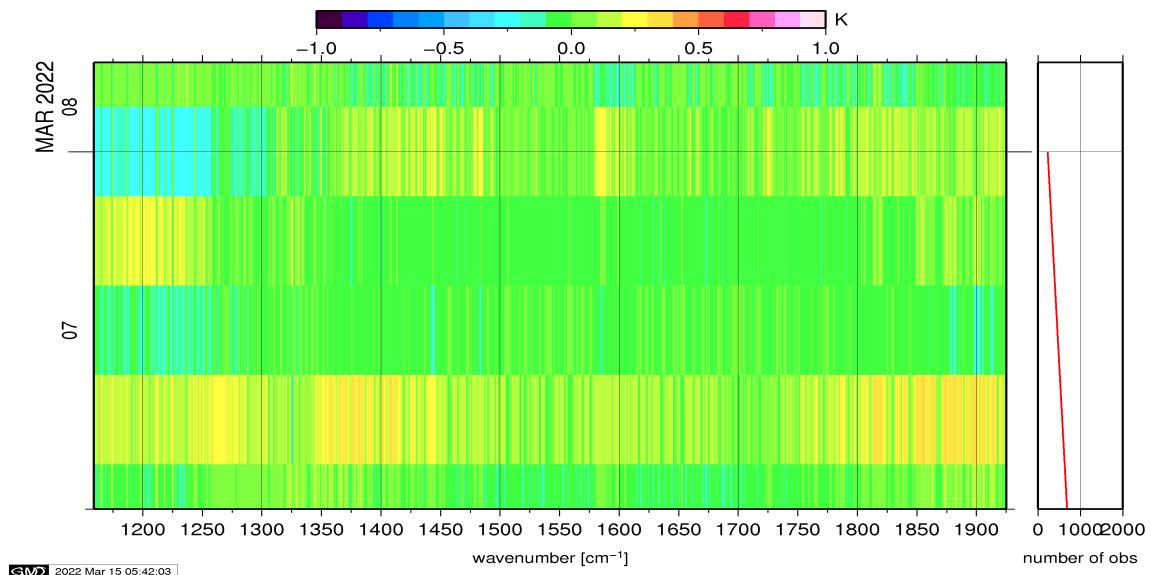


Figure 12: Radiance Anomaly in BT: IASI Band 2

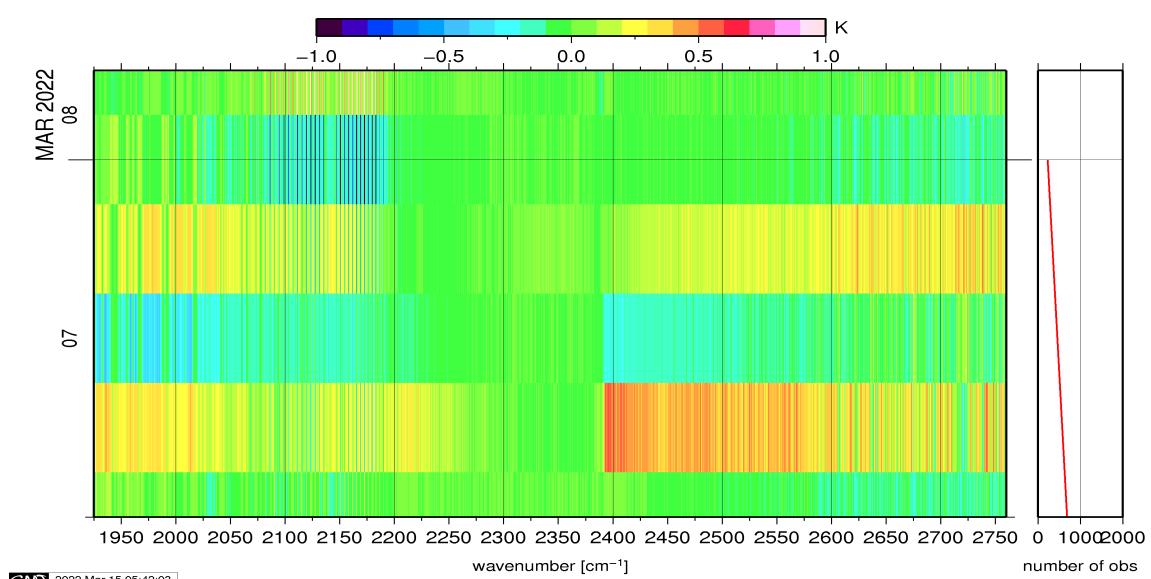


Figure 13: Radiance Anomaly in BT: IASI Band 3

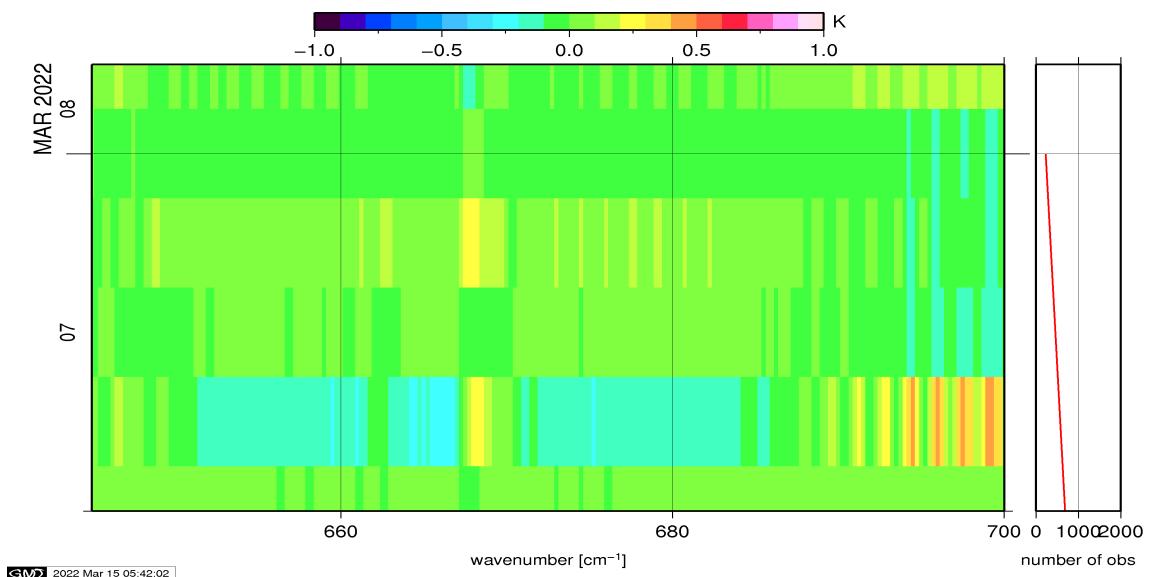


Figure 14: Radiance Anomaly in BT: CO2 14

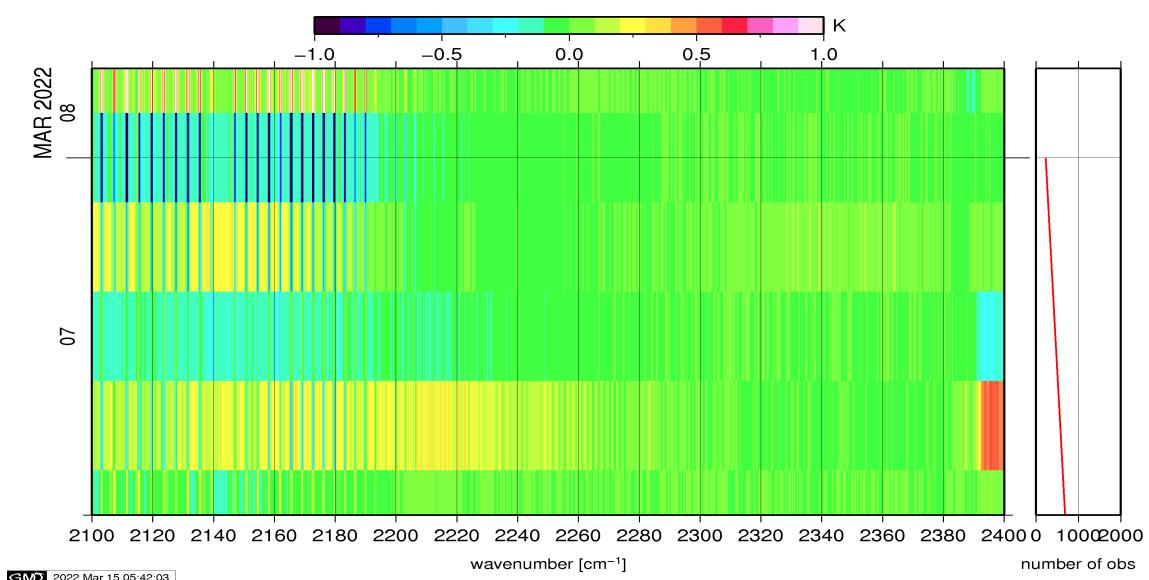


Figure 15: Radiance Anomaly in BT: CO2 4.3

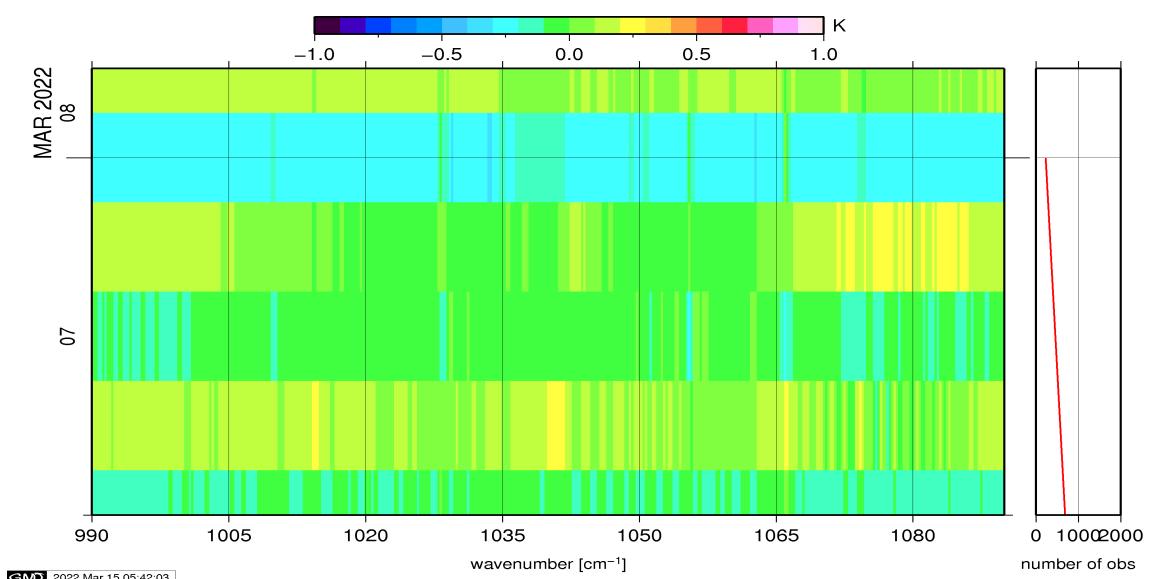


Figure 16: Radiance Anomaly in BT: O3

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.

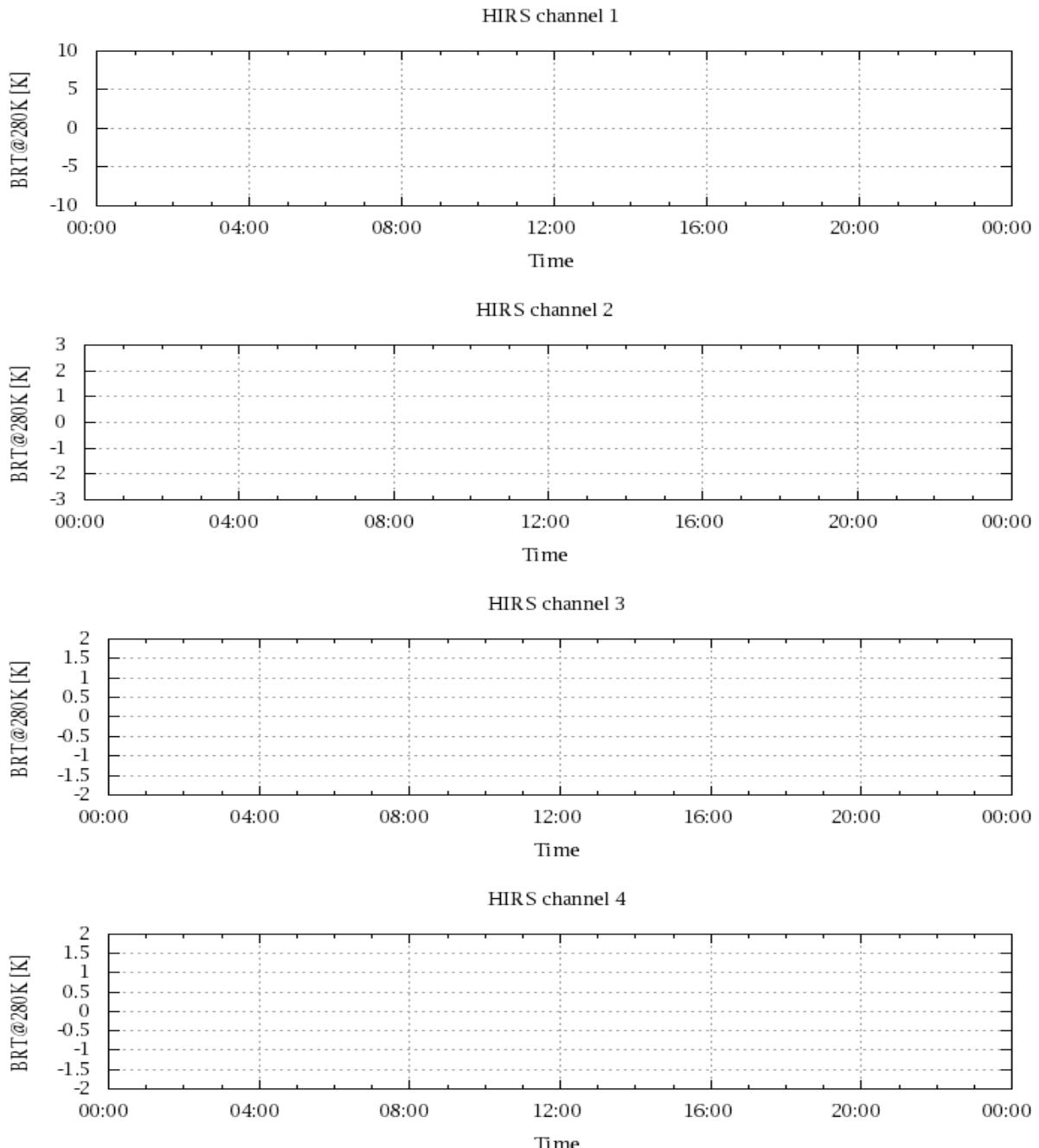


Figure 17: Radiance Differences in BT

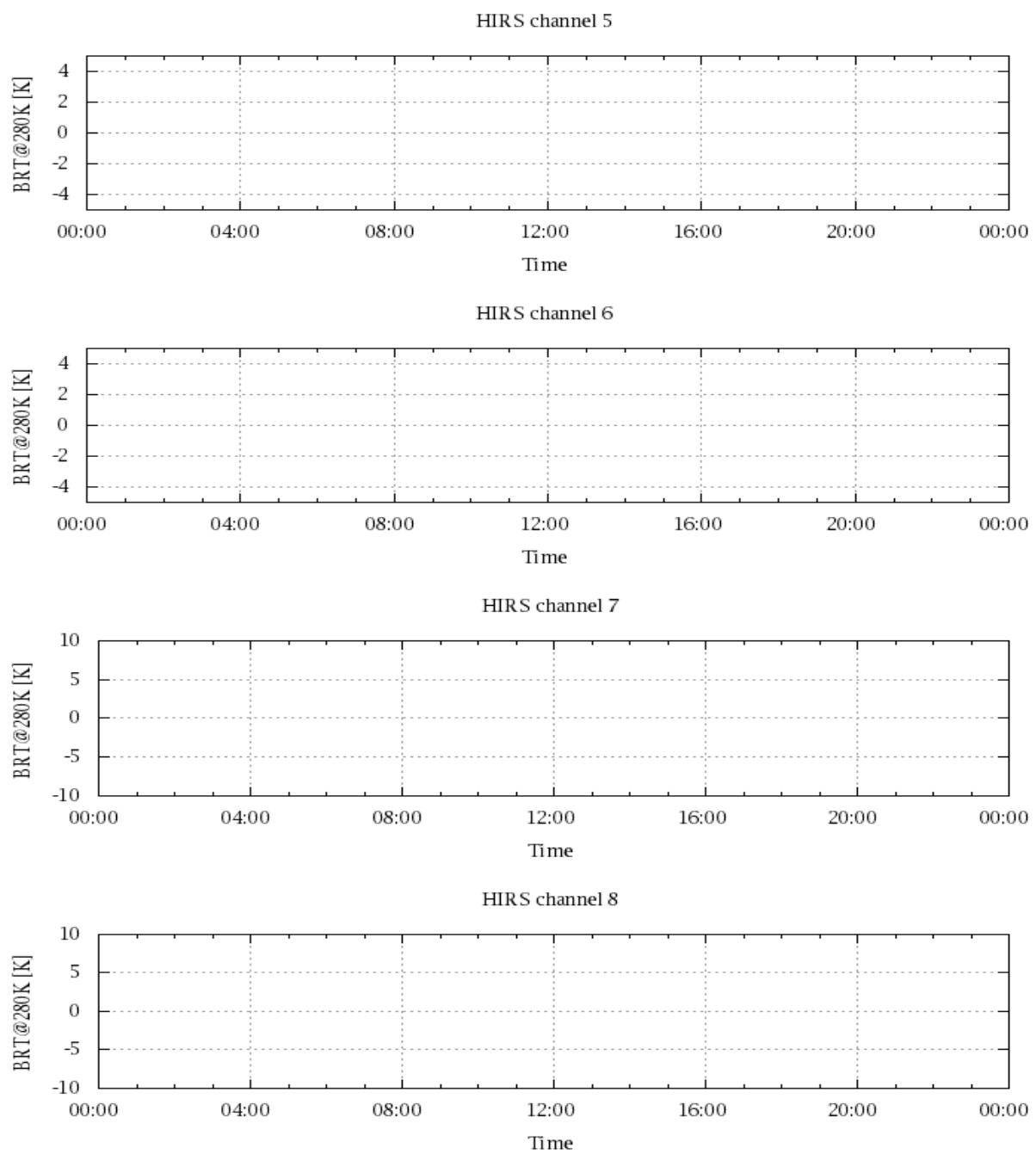


Figure 18: Radiance Differences in BT

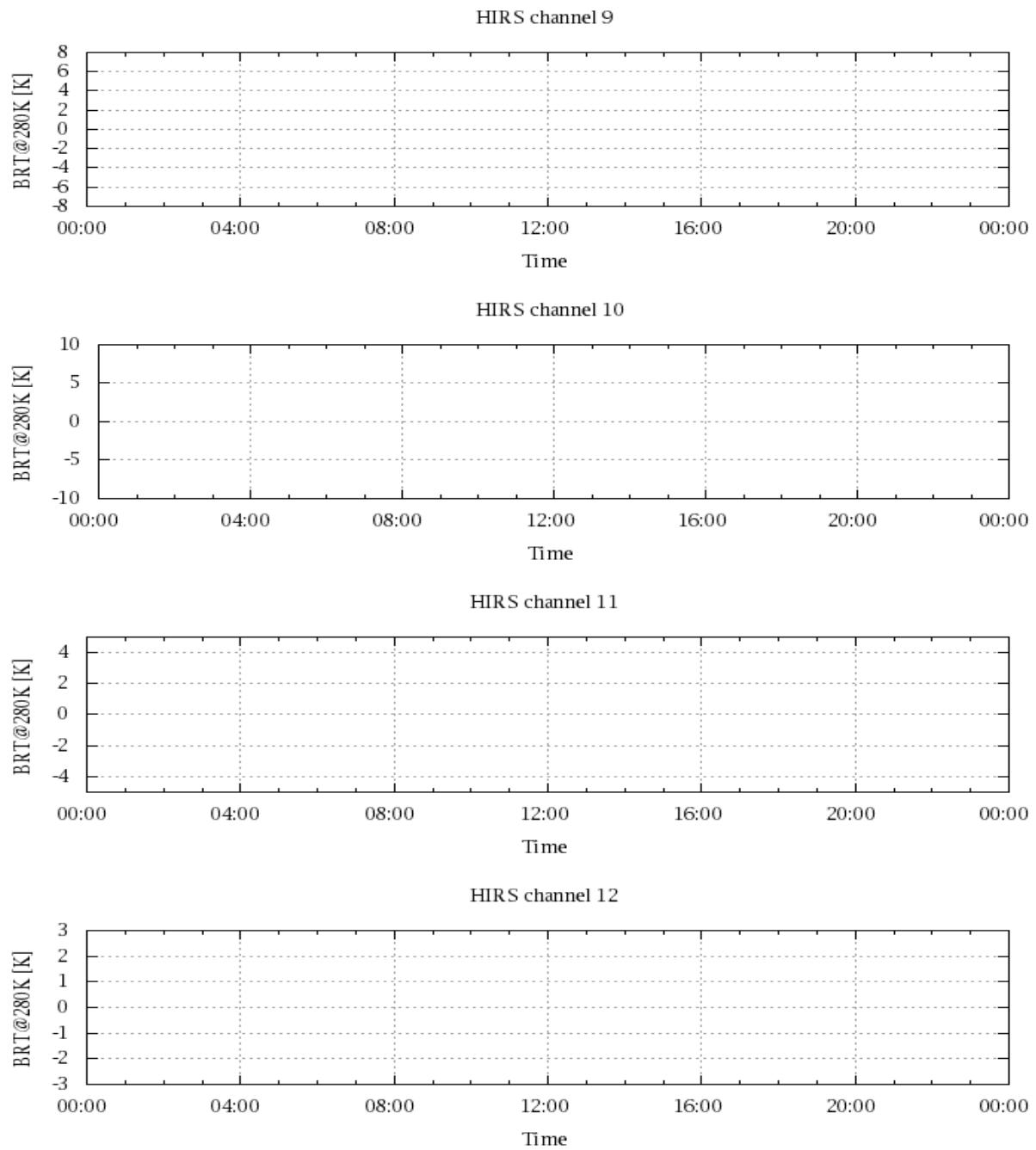


Figure 19: Radiance Differences in BT

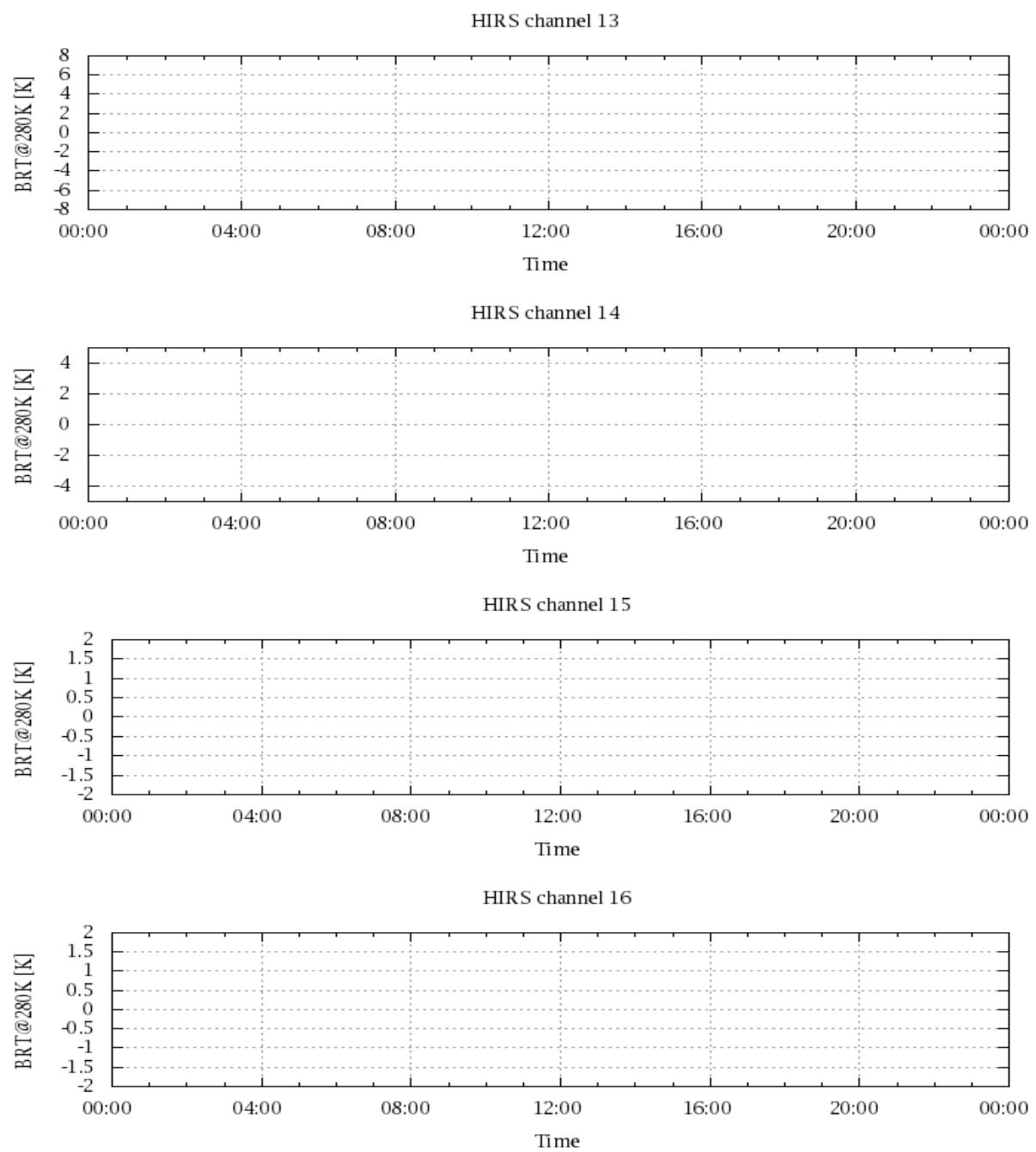


Figure 20: Radiance Differences in BT

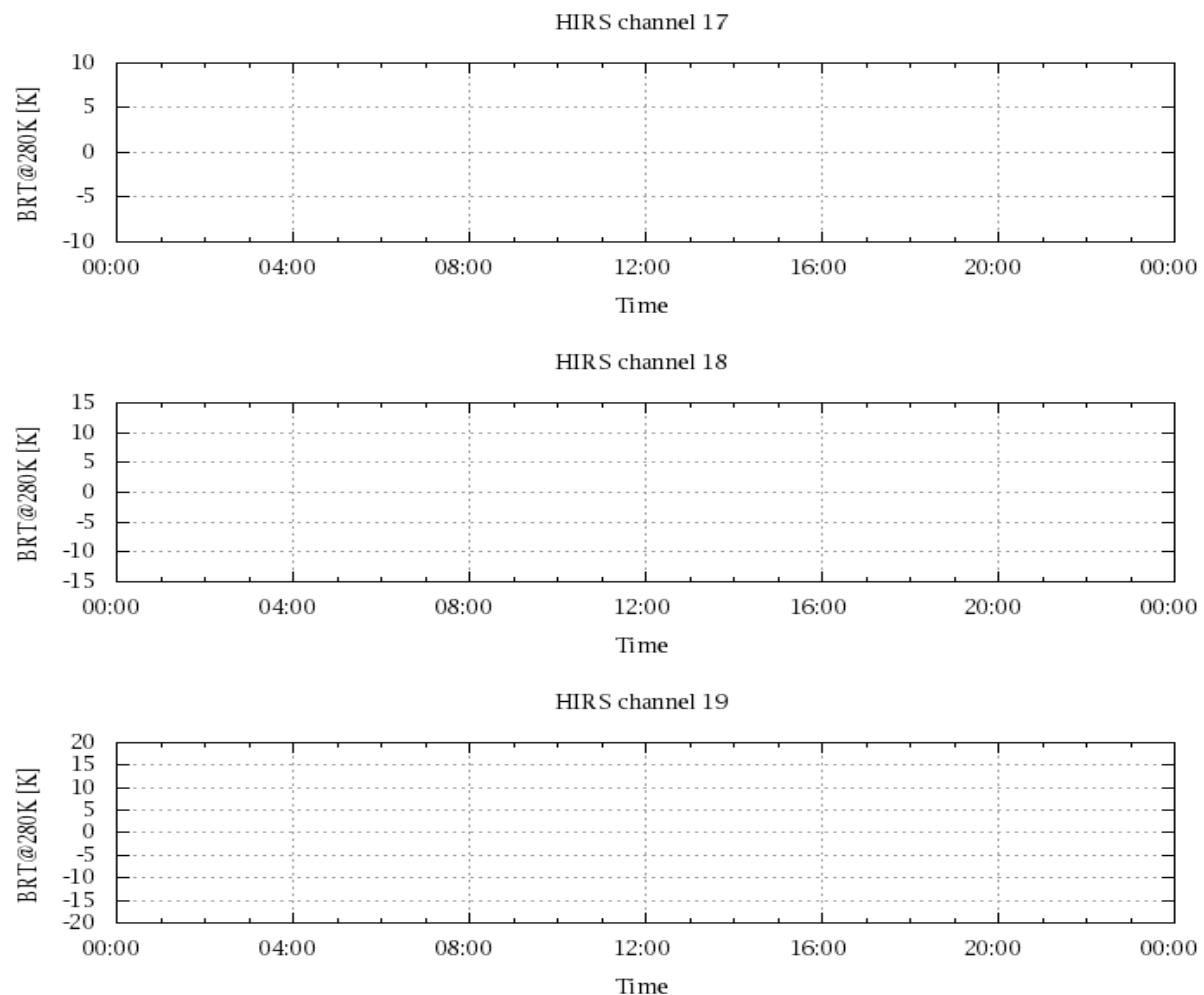


Figure 21: Radinace Differences in BT