

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

IASI monitoring team

09/05/2023 00:00:00 - 10/05/2023 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 09/05/2023 00:00:00 - 10/05/2023 00:00:00 .

The monitoring data are extracted on PDU basis.

2 Data quantity 09/05/2023 00:00:00 - 10/05/2023 00:00:00

Product Type	Number	Action
L0 HKTM PDUs	481	-
L0 IASI PDUs	481	-
L1 ENG PDUs	481	-
L1 ENG distinct GEPSGranule	475	-
L1 DPX PDUs (RM: IASI-HIRS)	0	e
L1 DPS Files (RM: OBS-CAL NWP based)	481	-

Table 1: Data quantity

APID	Seq from	Seq to	Time from	Time to
PX1 (130)	11028	11069	20230509165417.263	20230509165427.642
PX1 (130)	6560	6654	20230509174714.582	20230509174739.445
PX1 (130)	6938	7042	20230509174854.469	20230509174923.008
PX2 (135)	11028	11068	20230509165417.263	20230509165427.423
PX2 (135)	6560	6654	20230509174714.582	20230509174739.445
PX2 (135)	6938	7042	20230509174854.469	20230509174923.008
PX3 (140)	11028	11068	20230509165417.263	20230509165427.423
PX3 (140)	6560	6654	20230509174714.582	20230509174739.445
PX3 (140)	6938	7042	20230509174854.469	20230509174923.008
PX4 (145)	11028	11068	20230509165417.263	20230509165427.423
PX4 (145)	6560	6654	20230509174714.582	20230509174739.445
PX4 (145)	6938	7041	20230509174854.469	20230509174922.793
IMG (150)	1172	1216	20230509165417.263	20230509165427.423
IMG (150)	14675	14782	20230509174714.367	20230509174739.445
IMG (150)	15102	15221	20230509174854.469	20230509174922.793
VER (160)	8165	8171	20230509165414.450	20230509165430.450
VER (160)	10150	10166	20230509174710.473	20230509174742.473
VER (160)	10210	10231	20230509174846.472	20230509174926.468
AUX (180)	1631	1633	20230509165414.884	20230509165430.884
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Table 2 – continued from previous page

APID	Seq from	Seq to	Time from	Time to
AUX (180)	2028	2032	20230509174710.906	20230509174742.906
AUX (180)	2040	2045	20230509174846.902	20230509174926.902

Table 2: L0 data gaps

3 Instrument modes

Time	Transition from	Transition to
09/05/2023 00:00:04	-	Normal operation
09/05/2023 05:12:20	Normal operation	Auxiliary ASE synchronised
09/05/2023 05:14:28	Auxiliary ASE synchronised	External calibration
09/05/2023 09:08:19	External calibration	Auxiliary ASE synchronised
09/05/2023 09:10:27	Auxiliary ASE synchronised	Normal operation

Table 3: Instrument modes

4 L0 and L1 Data Quality

Flag	Value	Action
L0 IASI PDUs	481	-
L1 ENG PDUs	481	-
L1 ENG distinct GEPSGranule	475	-
GQisFlagQual set (PX1)	99.59 %	-
GQisFlagQual set (PX2)	99.64 %	-
GQisFlagQual set (PX3)	99.67 %	-
GQisFlagQual set (PX4)	99.59 %	-
GQisFlagQual set (all)	99.62 %	-

Table 4: Quality flags

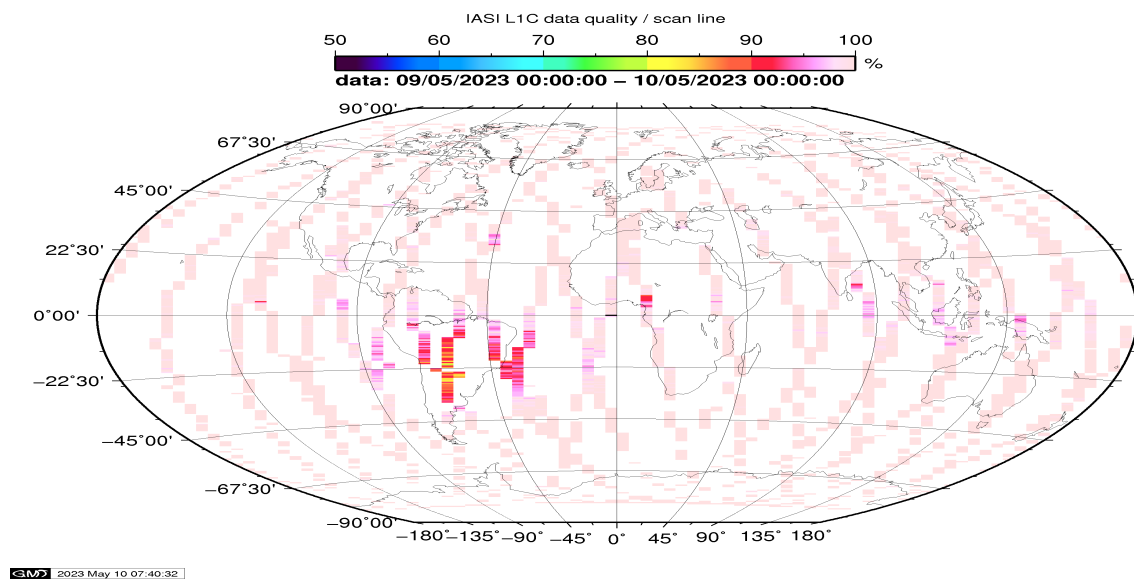


Figure 1: L1C data quality

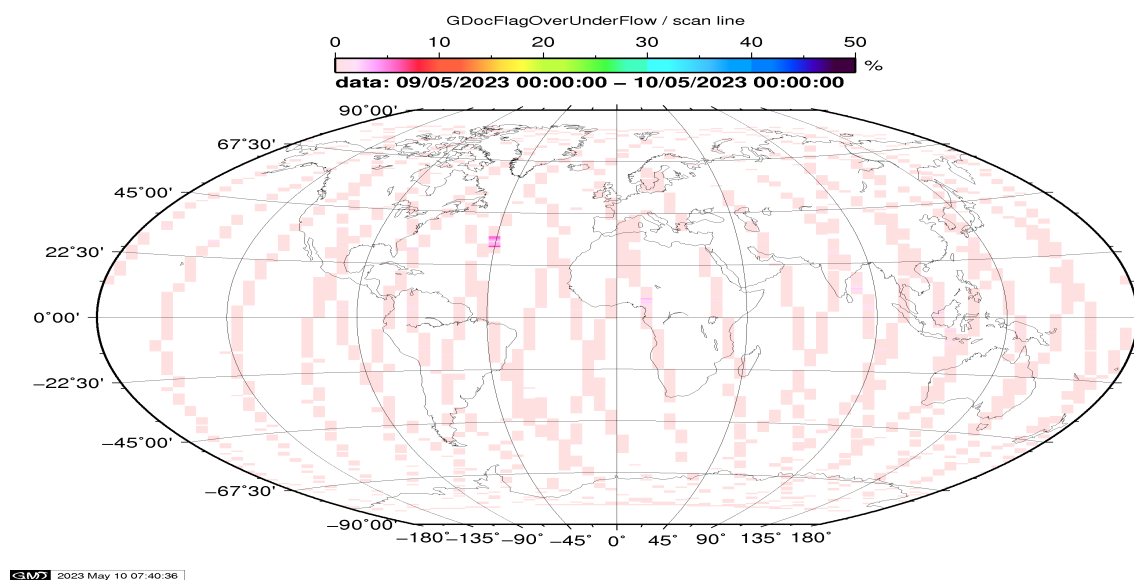


Figure 2: Flag of Over and Under Flows

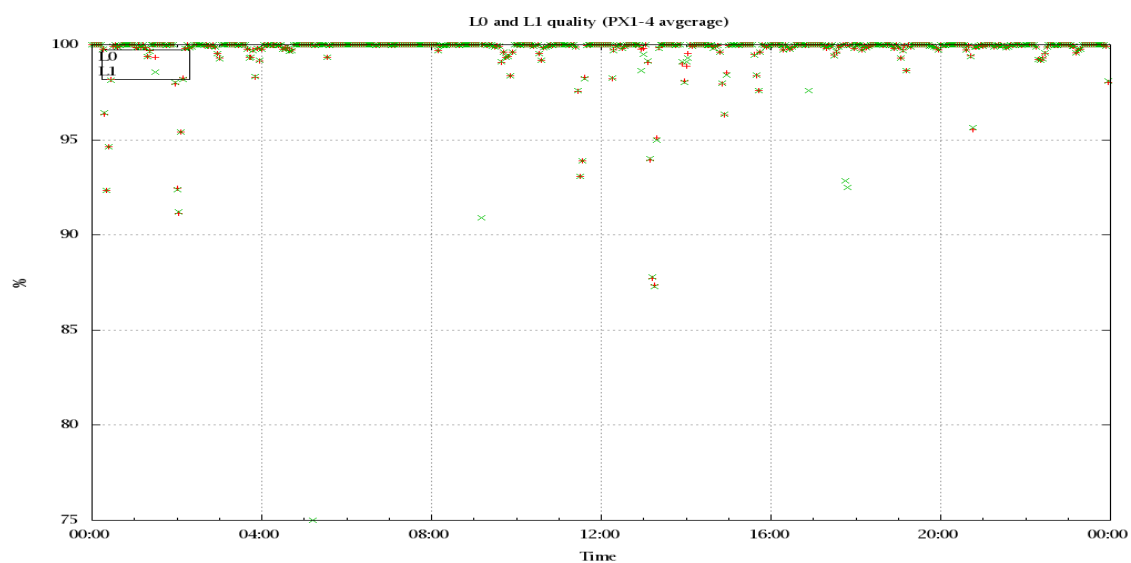


Figure 3: Level 0 and 1C overall quality

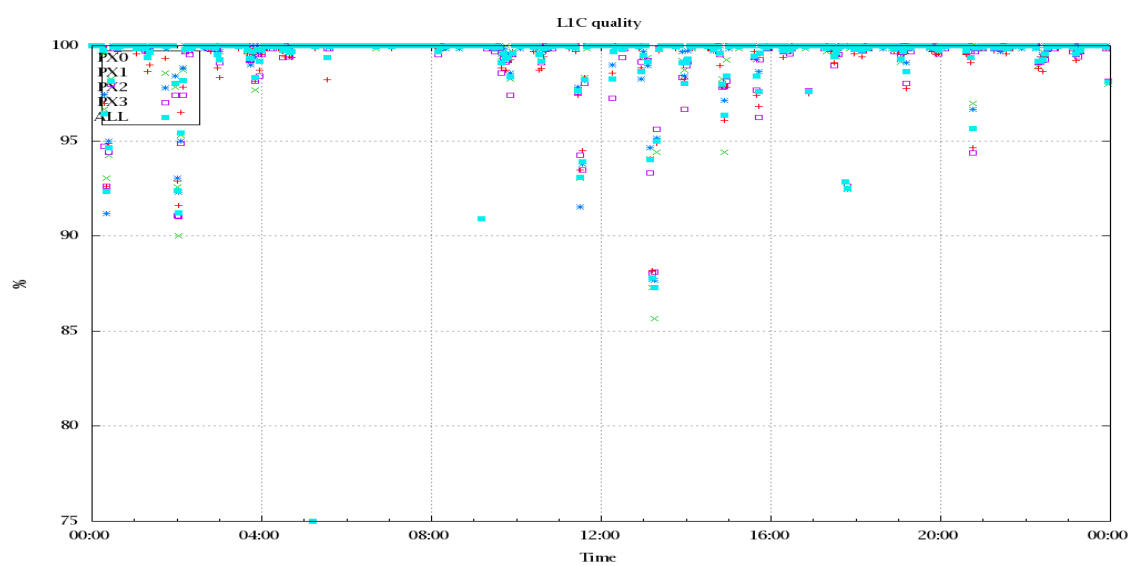


Figure 4: Level 1C quality

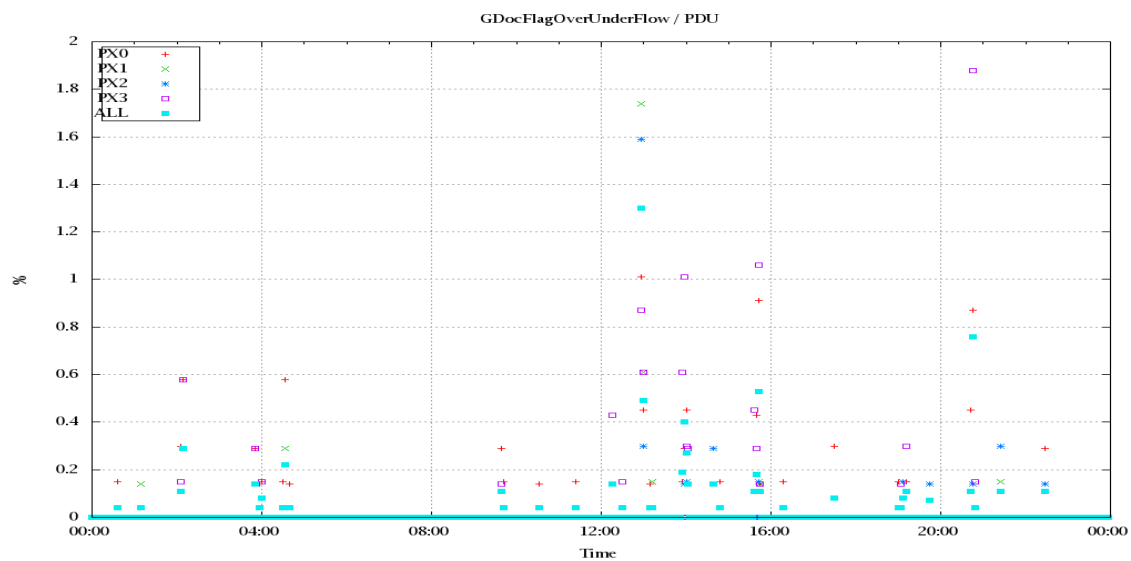


Figure 5: Timeseries of flag of Over and Under Flows

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.

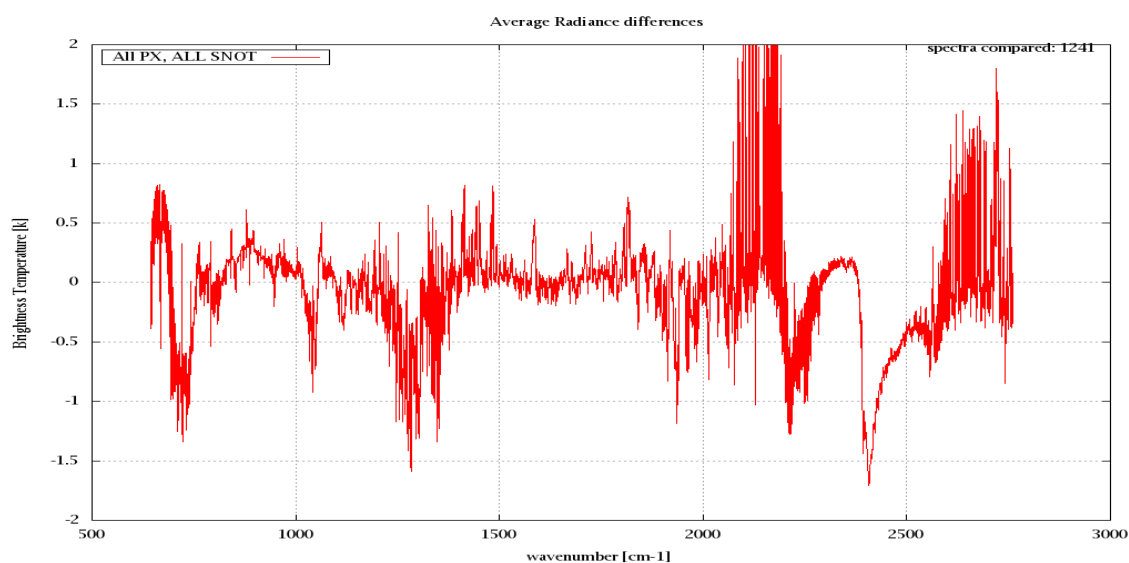


Figure 6: Average Radiance differences: OBS-CAL

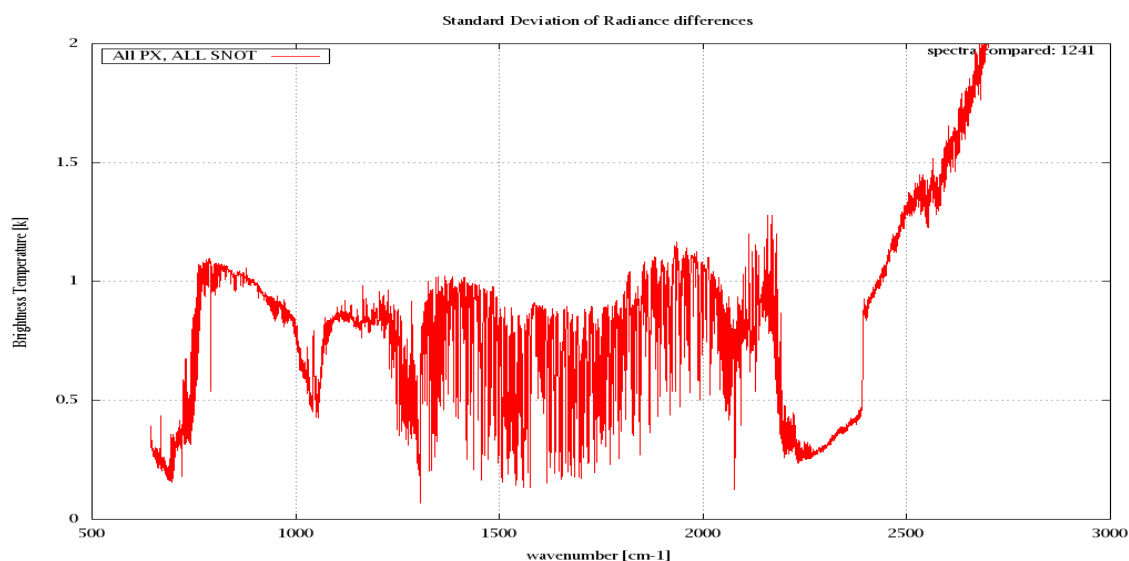


Figure 7: Standard Deviation of Radiance differences

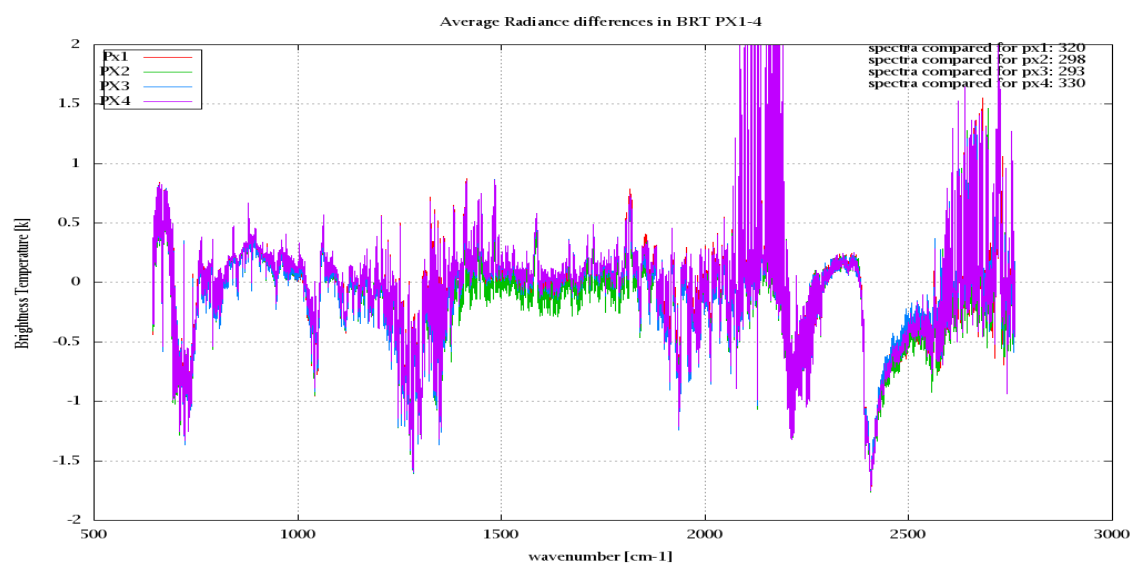


Figure 8: Average Radiance differences: OBS-CAL

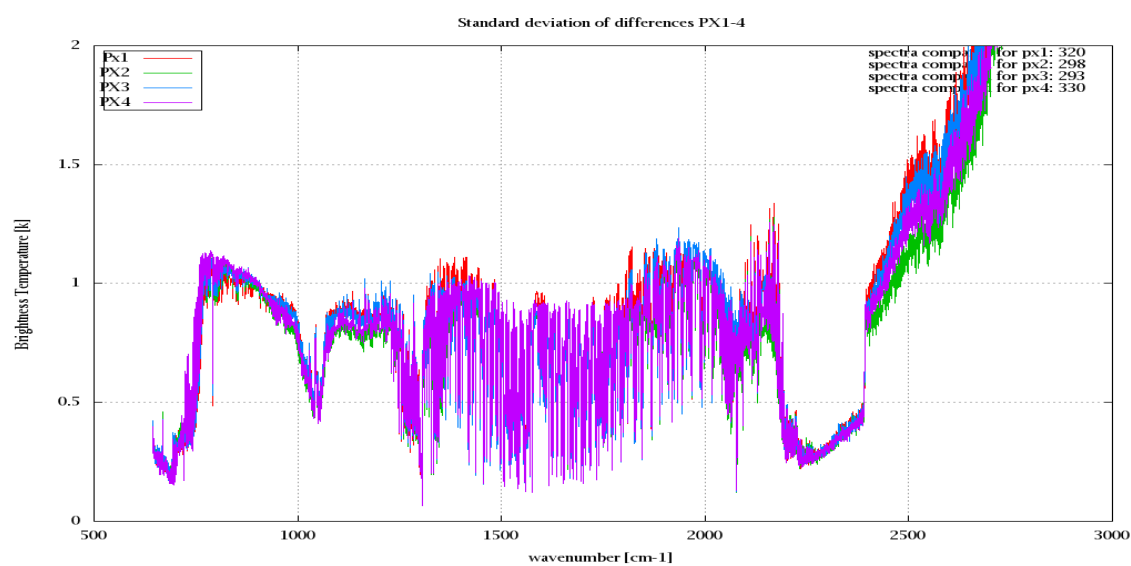


Figure 9: Standard Deviation of Radiance differences

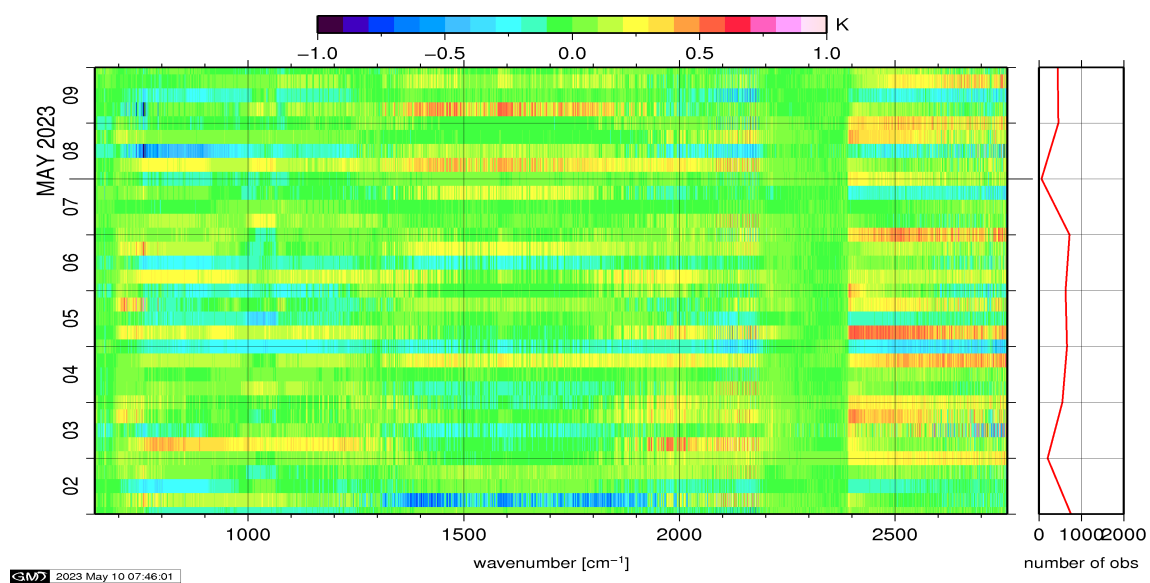


Figure 10: Radiance Anomaly in BT: All Channels

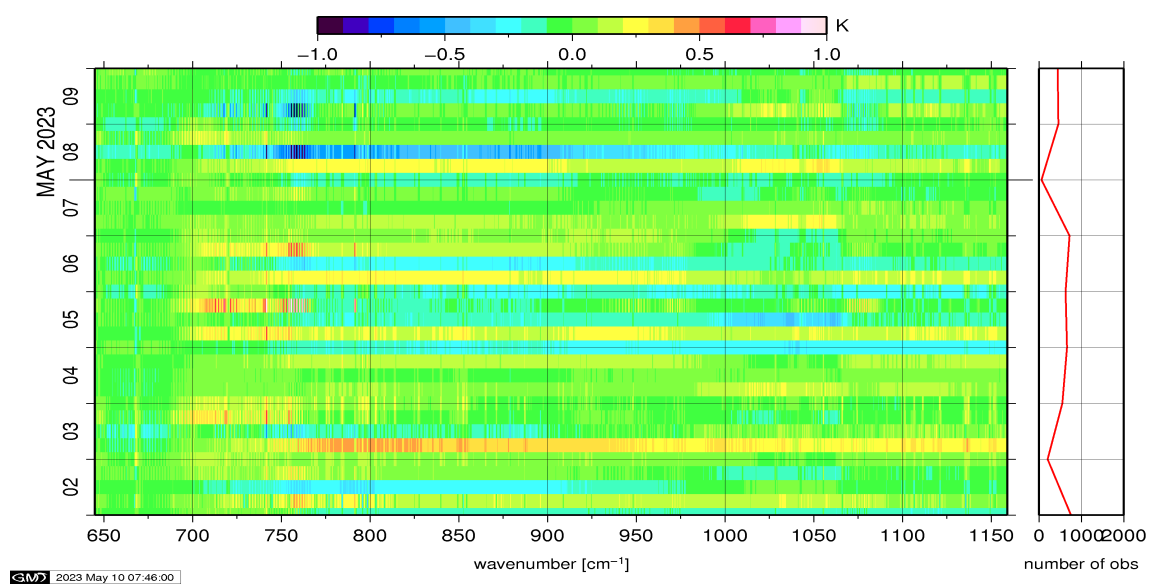


Figure 11: Radiance Anomaly in BT: IASI Band 1

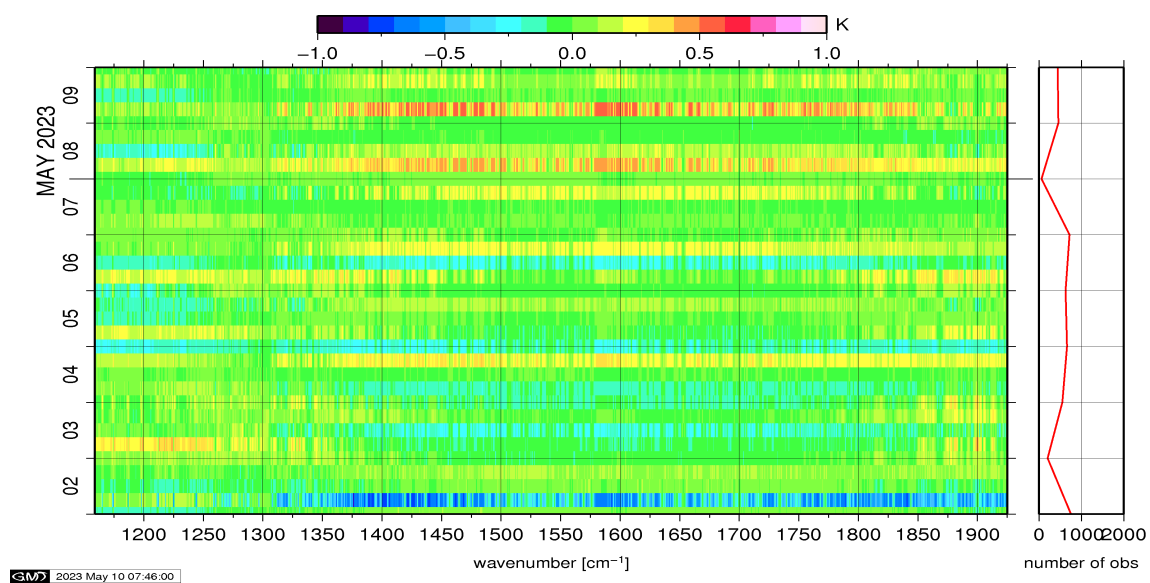


Figure 12: Radiance Anomaly in BT: IASI Band 2

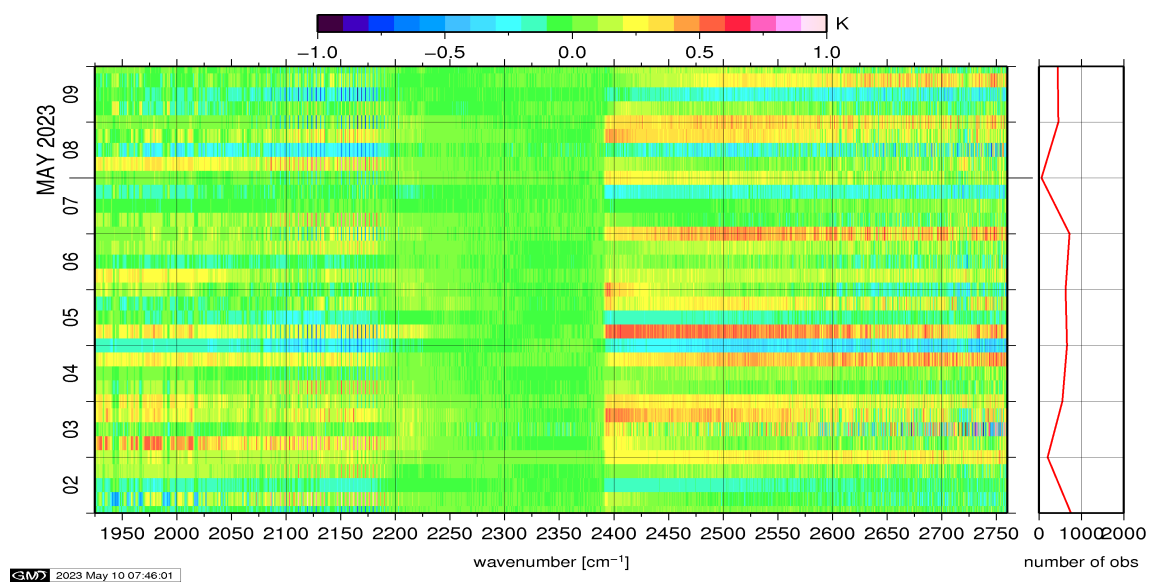


Figure 13: Radiance Anomaly in BT: IASI Band 3

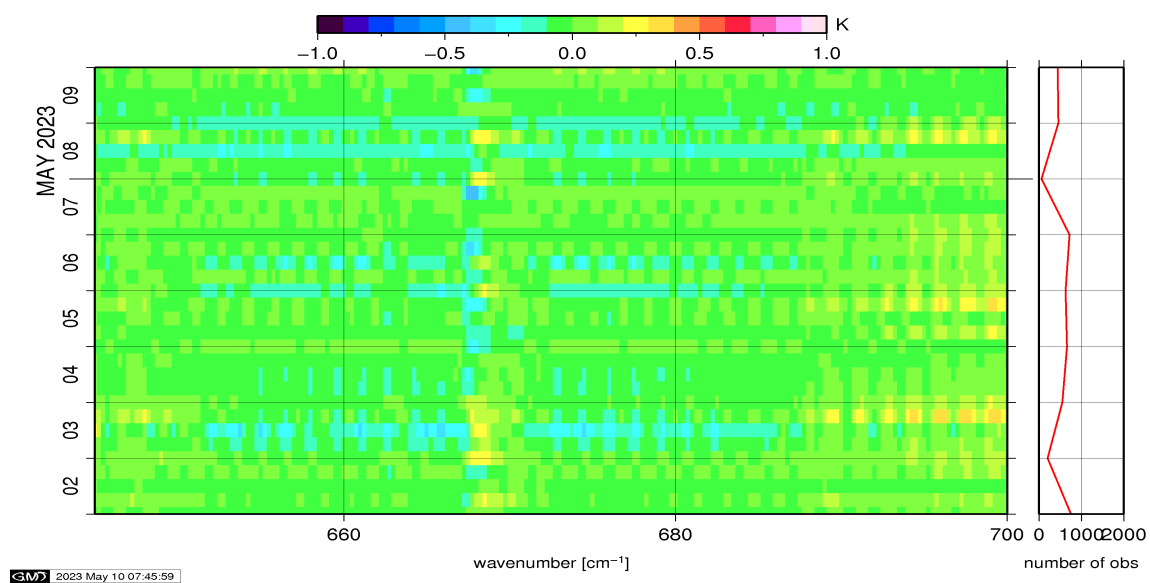


Figure 14: Radiance Anomaly in BT: CO2 14

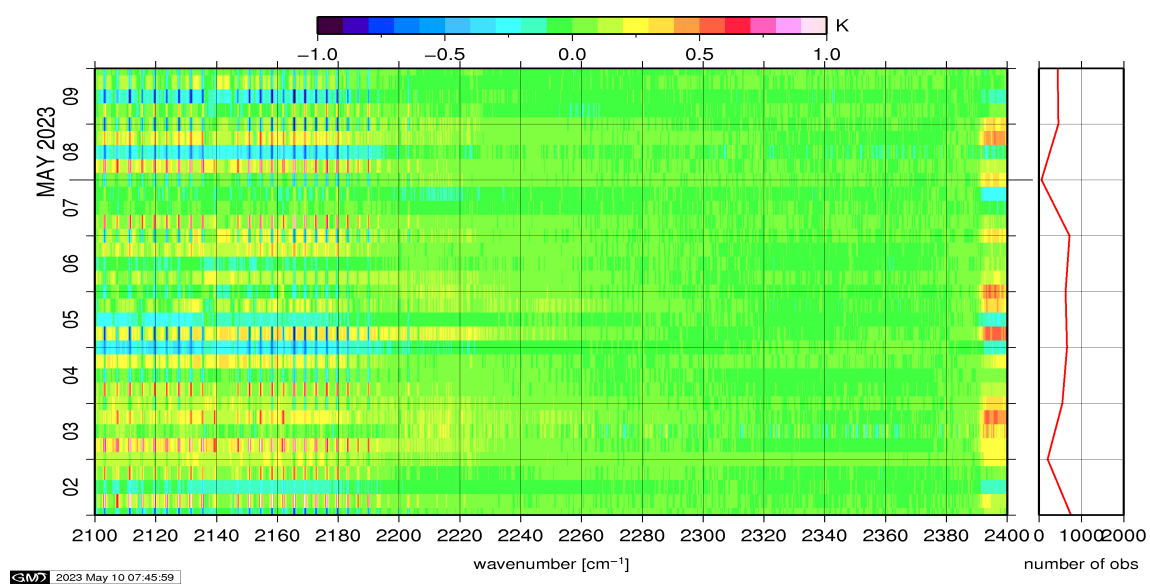


Figure 15: Radiance Anomaly in BT: CO2 4.3

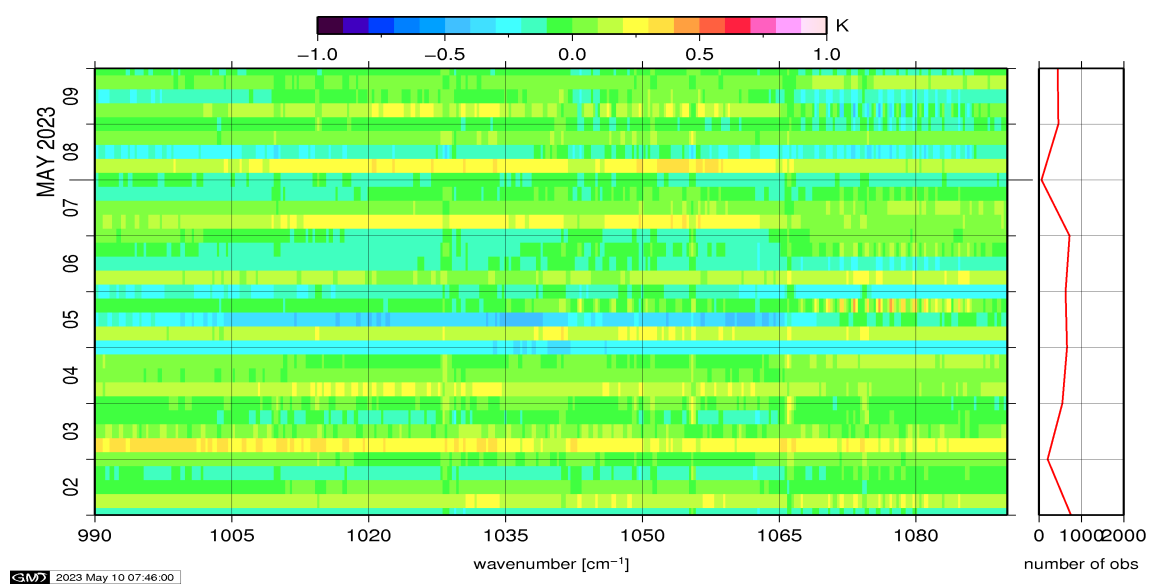


Figure 16: Radiance Anomaly in BT: O3

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.

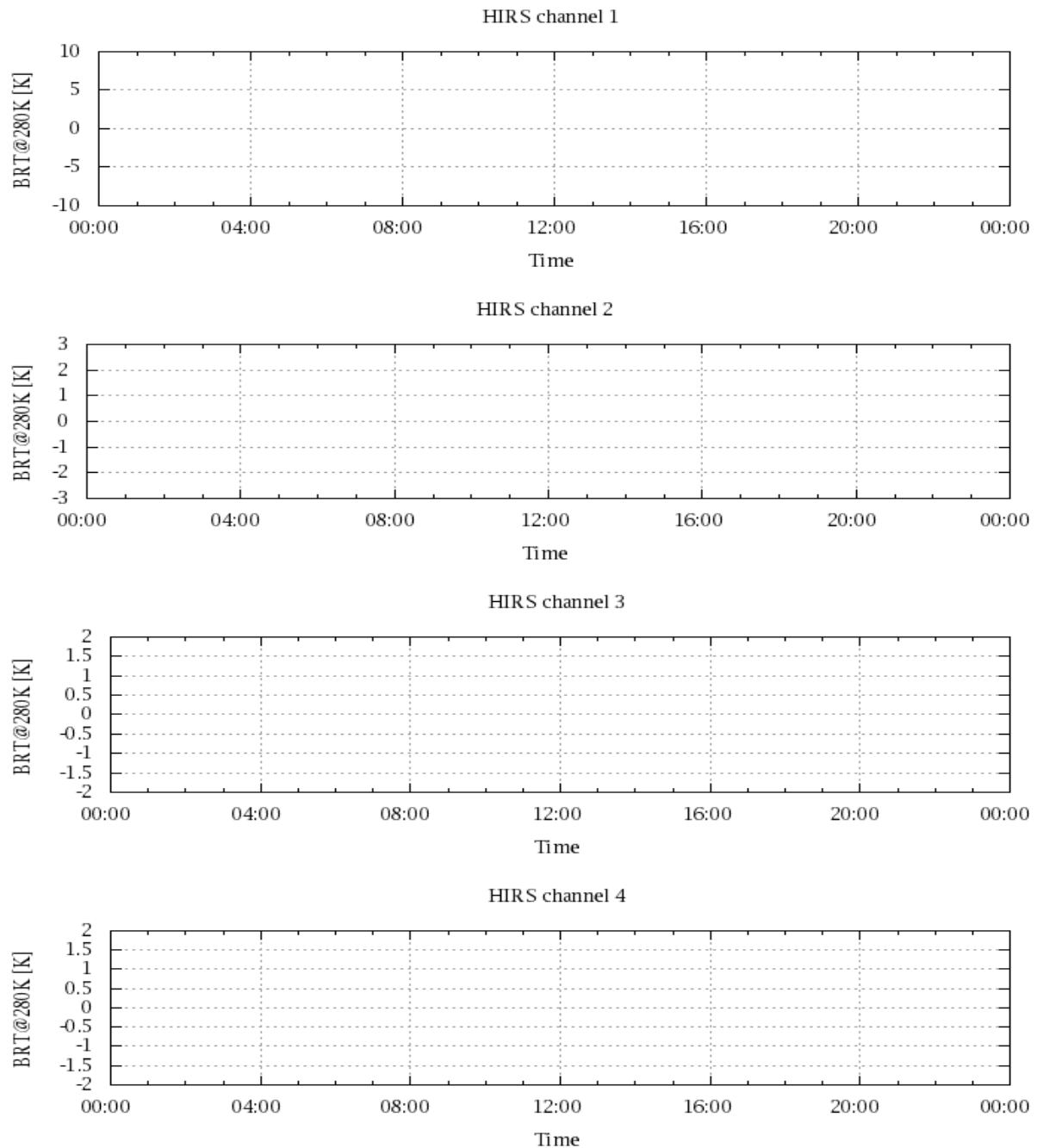


Figure 17: Radiance Differences in BT



Figure 18: Radiance Differences in BT



Figure 19: Radiance Differences in BT



Figure 20: Radiance Differences in BT



Figure 21: Radinace Differences in BT