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

IASI monitoring team

31/12/2024 00:00:00 - 01/01/2025 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 31/12/2024 00:00:00 - 01/01/2025 00:00:00 .

The monitoring data are extracted on PDU basis.

2 Data quantity 31/12/2024 00:00:00 - 01/01/2025 00:00:00

Product Type	Number	Action
L0 HKTM PDUs	351	e
L0 IASI PDUs	355	e
L1 ENG PDUs	352	e
L1 ENG distinct GEPSGranule	346	a
L1 DPX PDUs (RM: IASI-HIRS)	0	e
L1 DPS Files (RM: OBS-CAL NWP based)	352	-

Table 1: Data quantity

APID	Seq from	Seq to	Time from	Time to
PX1 (130)	5396	951	20241231004213.076	20241231013516.841
PX1 (130)	2433	7575	20241231014152.977	20241231031732.418
PX1 (130)	10716	14483	20241231033130.448	20241231050104.495
PX1 (130)	9166	4723	20241231055015.870	20241231064320.068
PX1 (130)	15796	11063	20241231073232.705	20241231082419.071
PX1 (130)	6036	1015	20241231091448.282	20241231100518.758
PX2 (135)	5396	951	20241231004213.076	20241231013516.841
PX2 (135)	2432	7574	20241231014152.758	20241231031732.203
PX2 (135)	10716	14483	20241231033130.448	20241231050104.495
PX2 (135)	9166	4723	20241231055015.870	20241231064320.068
PX2 (135)	15796	11063	20241231073232.705	20241231082419.071
PX2 (135)	6036	1015	20241231091448.282	20241231100518.758
PX3 (140)	5396	950	20241231004213.076	20241231013516.626
PX3 (140)	2432	7574	20241231014152.758	20241231031732.203
PX3 (140)	10716	14483	20241231033130.448	20241231050104.495
PX3 (140)	9165	4723	20241231055015.655	20241231064320.068
PX3 (140)	15795	11062	20241231073232.490	20241231082418.853

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Table 2 – continued from previous page

APID	Seq from	Seq to	Time from	Time to
PX3 (140)	6035	1015	20241231091448.067	20241231100518.758
PX4 (145)	5396	950	20241231004213.076	20241231013516.626
PX4 (145)	2432	7574	20241231014152.758	20241231031732.203
PX4 (145)	10715	14483	20241231033130.229	20241231050104.495
PX4 (145)	9165	4723	20241231055015.655	20241231064320.068
PX4 (145)	15795	11062	20241231073232.490	20241231082418.853
PX4 (145)	6035	1015	20241231091448.067	20241231100518.758
IMG (150)	13344	10490	20241231004213.076	20241231013516.626
IMG (150)	12172	3798	20241231014152.758	20241231031732.203
IMG (150)	7359	13815	20241231033130.229	20241231050104.495
IMG (150)	9973	7123	20241231055015.655	20241231064320.068
IMG (150)	3287	106	20241231073232.490	20241231082418.853
IMG (150)	12979	9471	20241231091448.067	20241231100517.461
VER (160)	10091	12081	20241231004213.076	20241231013517.056
VER (160)	12330	15916	20241231014149.083	20241231031733.066
VER (160)	56	3417	20241231033125.042	20241231050109.034
VER (160)	5261	7252	20241231055013.061	20241231064325.045
VER (160)	9096	11037	20241231073229.033	20241231082421.017
VER (160)	12931	14827	20241231091445.040	20241231100525.027
AUX (180)	1986	2385	20241231004205.510	20241231013517.489
AUX (180)	2434	3152	20241231014149.516	20241231031733.500
AUX (180)	3256	3929	20241231033125.475	20241231050109.468
AUX (180)	4297	4696	20241231055013.491	20241231064325.475
AUX (180)	5064	5453	20241231073229.462	20241231082421.446
AUX (180)	5831	6210	20241231091445.473	20241231100517.461

Table 2: L0 data gaps

3 Instrument modes

Time	Transition from	Transition to
31/12/2024 00:07:30	-	Normal operation

Table 3: Instrument modes

4 L0 and L1 Data Quality

Flag	Value	Action
L0 IASI PDUs	355	e
L1 ENG PDUs	352	e
L1 ENG distinct GEPSGranule	346	a
GQisFlagQual set (PX1)	99.53 %	-
GQisFlagQual set (PX2)	99.58 %	-
GQisFlagQual set (PX3)	99.60 %	-
GQisFlagQual set (PX4)	99.54 %	-
GQisFlagQual set (all)	99.56 %	-

Table 4: Quality flags

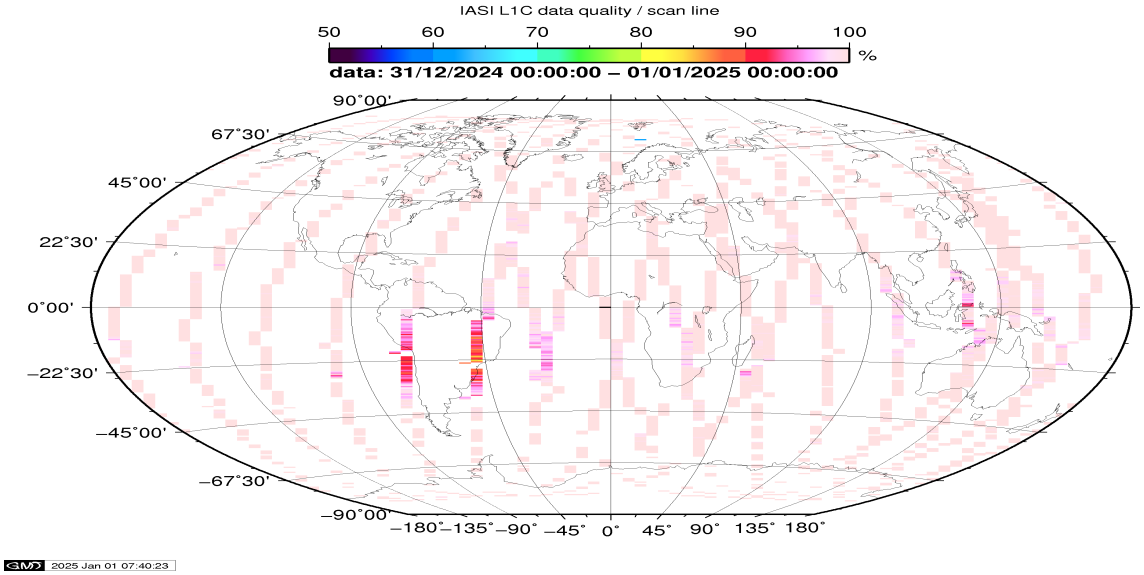

Figure 1: L1C data quality

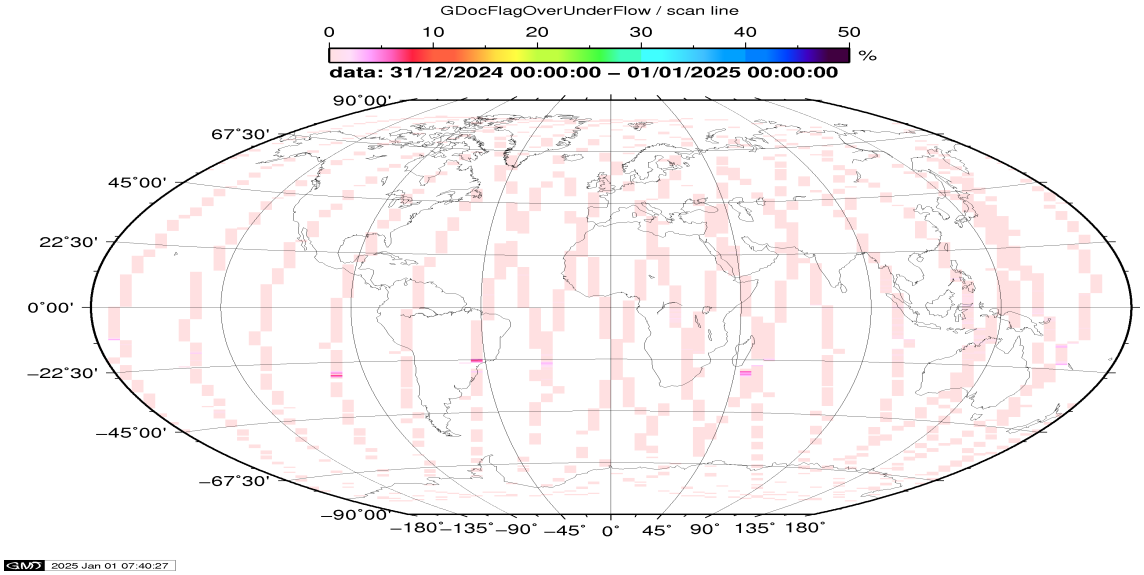

Figure 2: Flag of Over and Under Flows

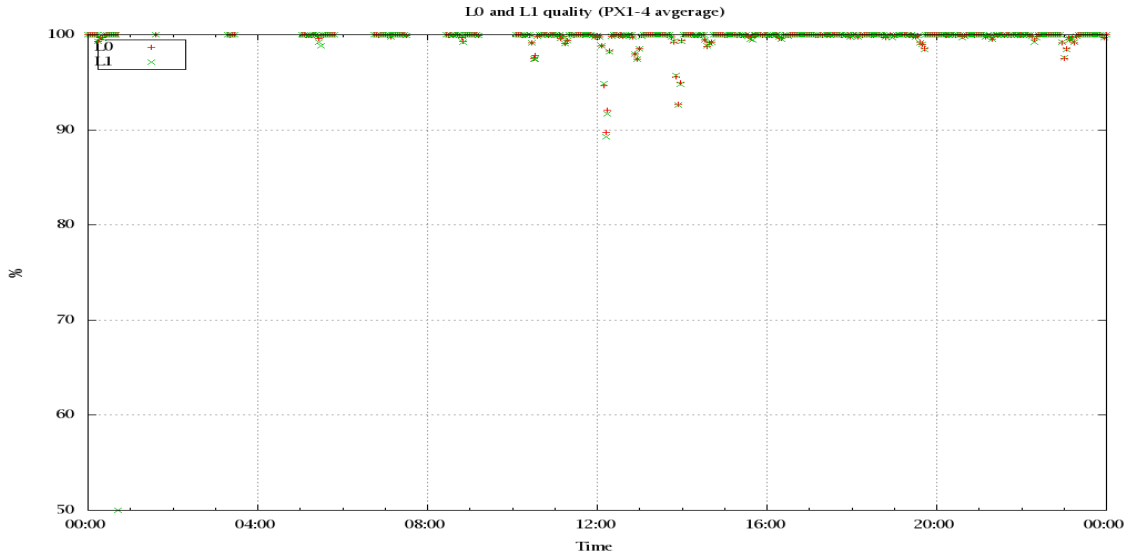

Figure 3: Level 0 and 1C overall quality

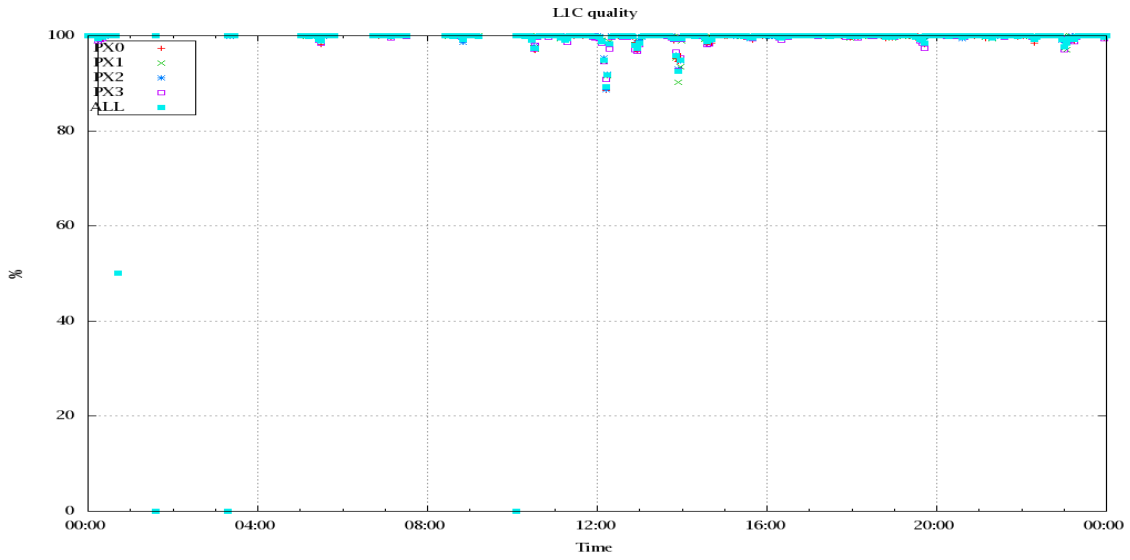

Figure 4: Level 1C quality

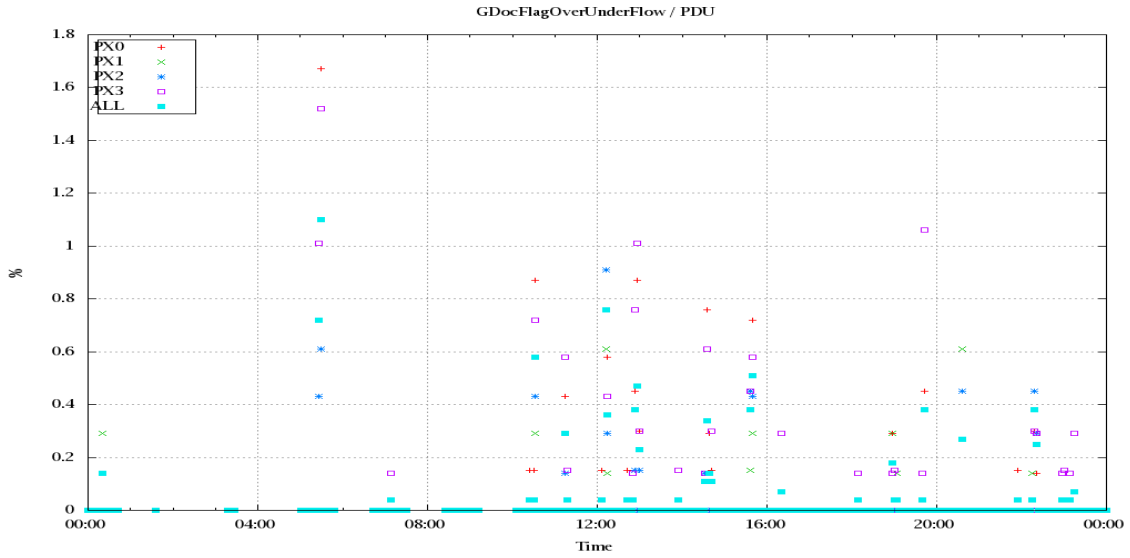

Figure 5: Timeseries of flag of Over and Under Flows

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.

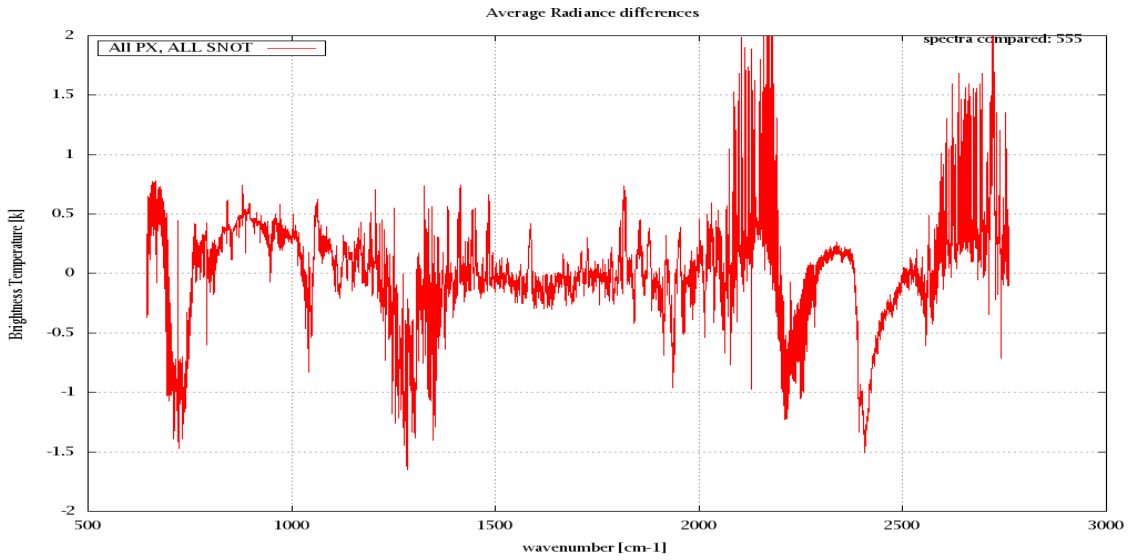

Figure 6: Average Radiance differences: OBS-CAL

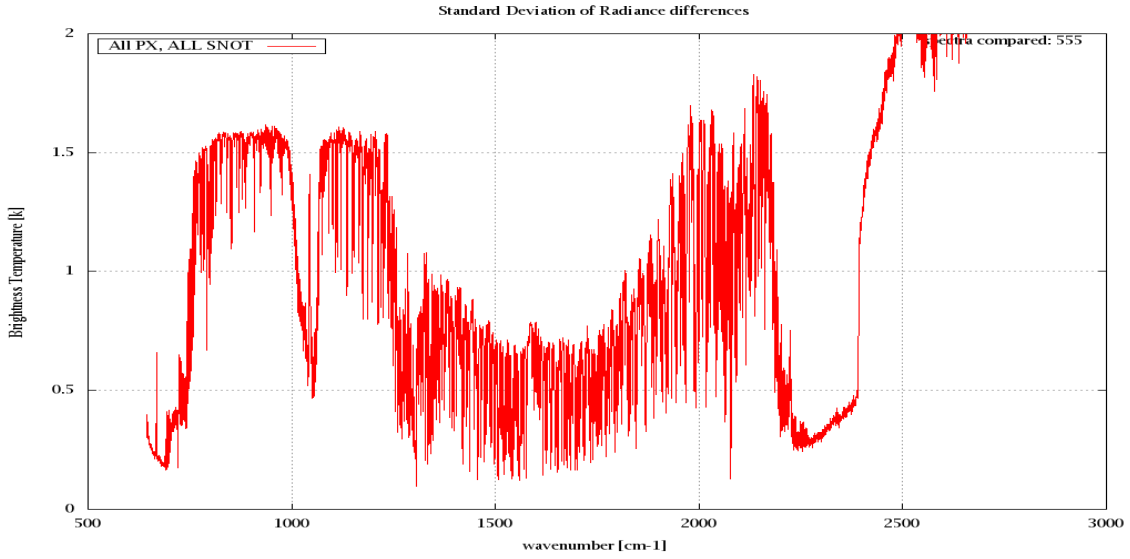

Figure 7: Standard Deviation of Radiance differences

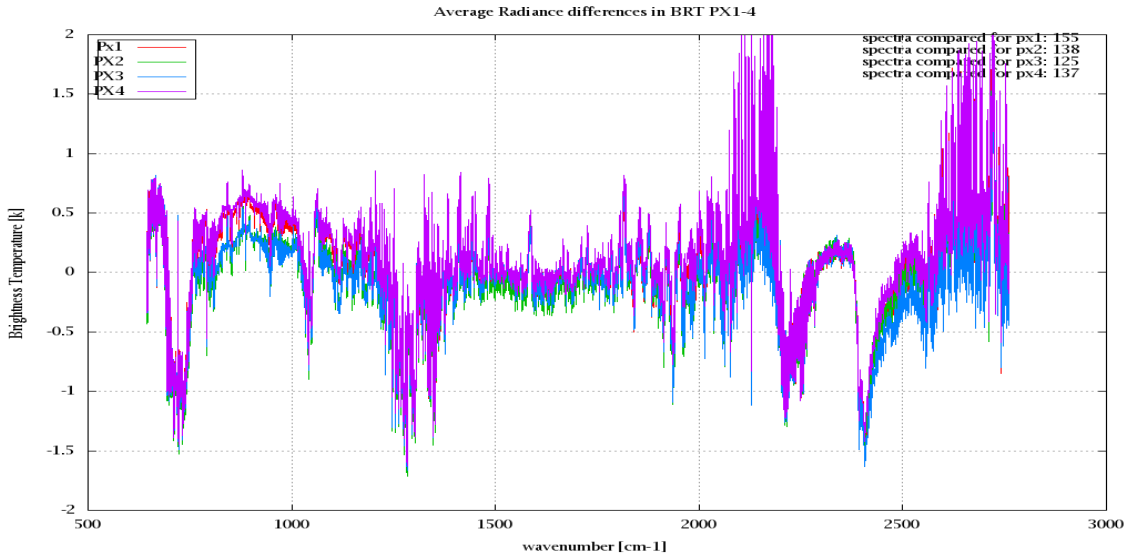

Figure 8: Average Radiance differences: OBS-CAL

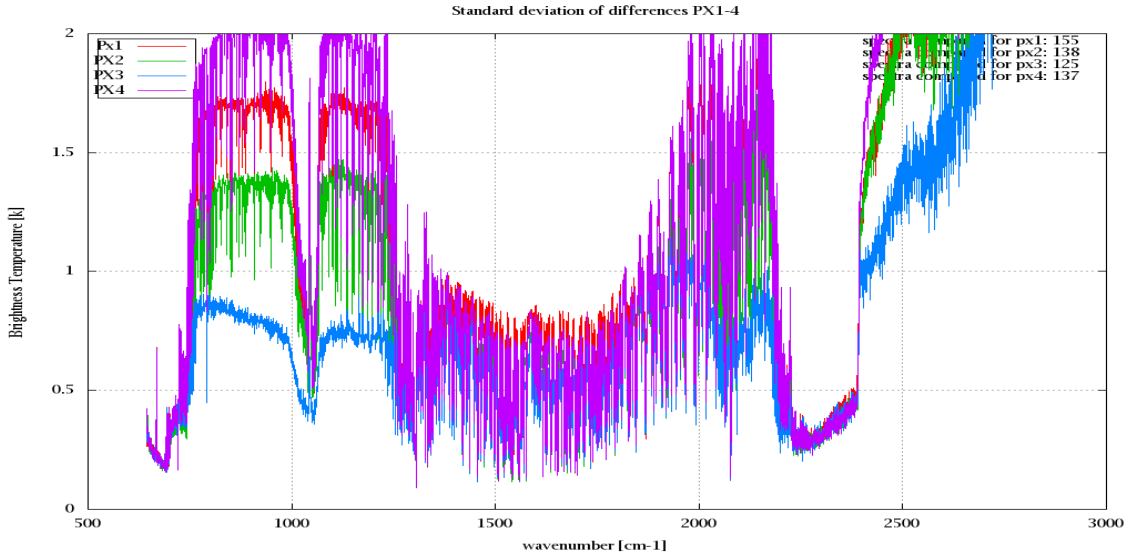

Figure 9: Standard Deviation of Radiance differences

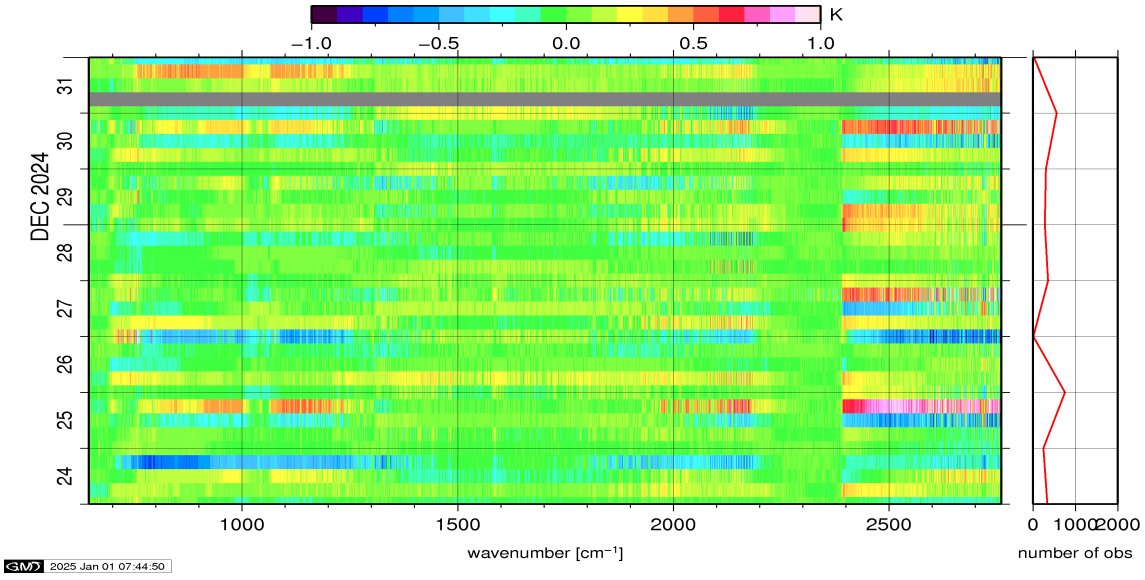

Figure 10: Radiance Anomaly in BT: All Channels

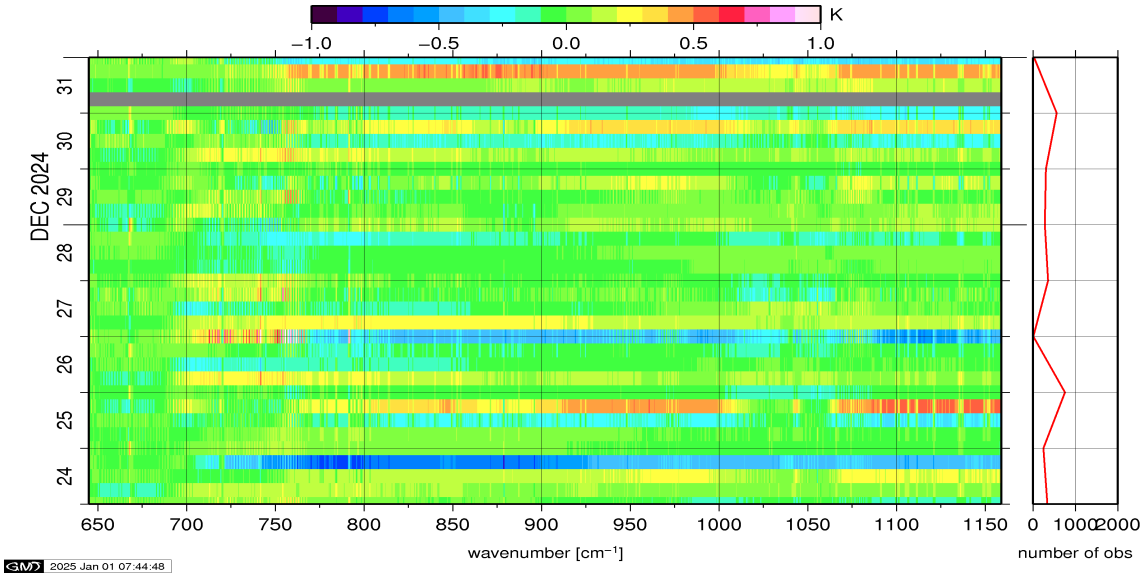

Figure 11: Radiance Anomaly in BT: IASI Band 1

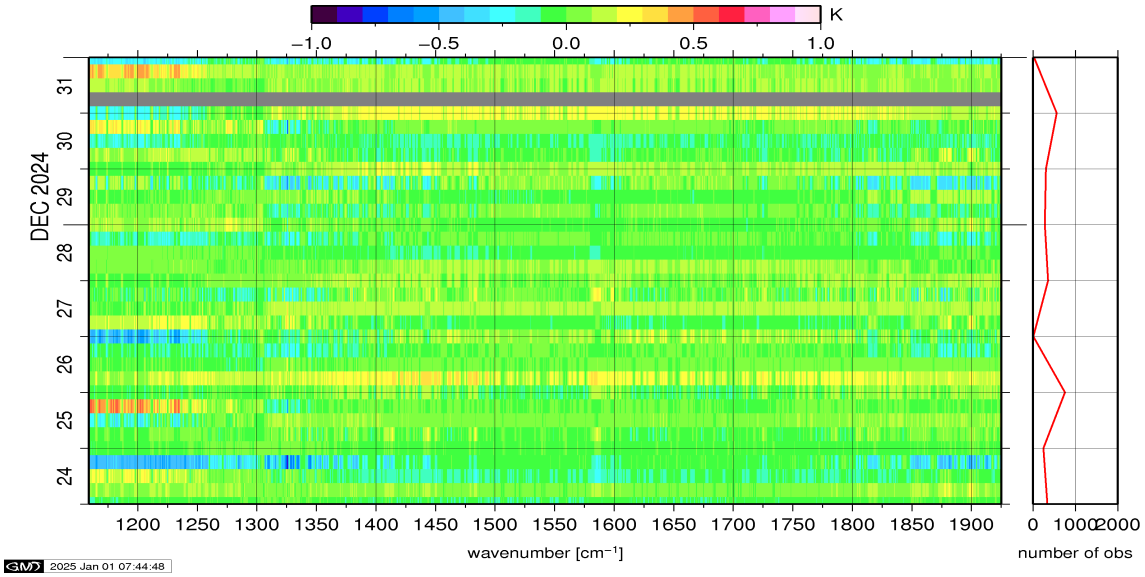

Figure 12: Radiance Anomaly in BT: IASI Band 2

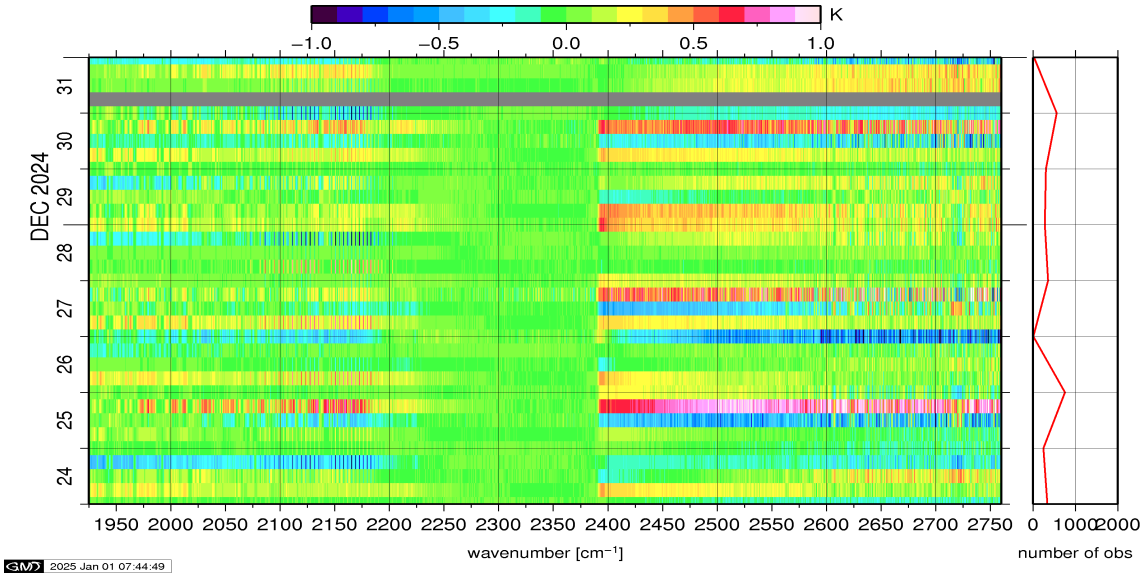

Figure 13: Radiance Anomaly in BT: IASI Band 3

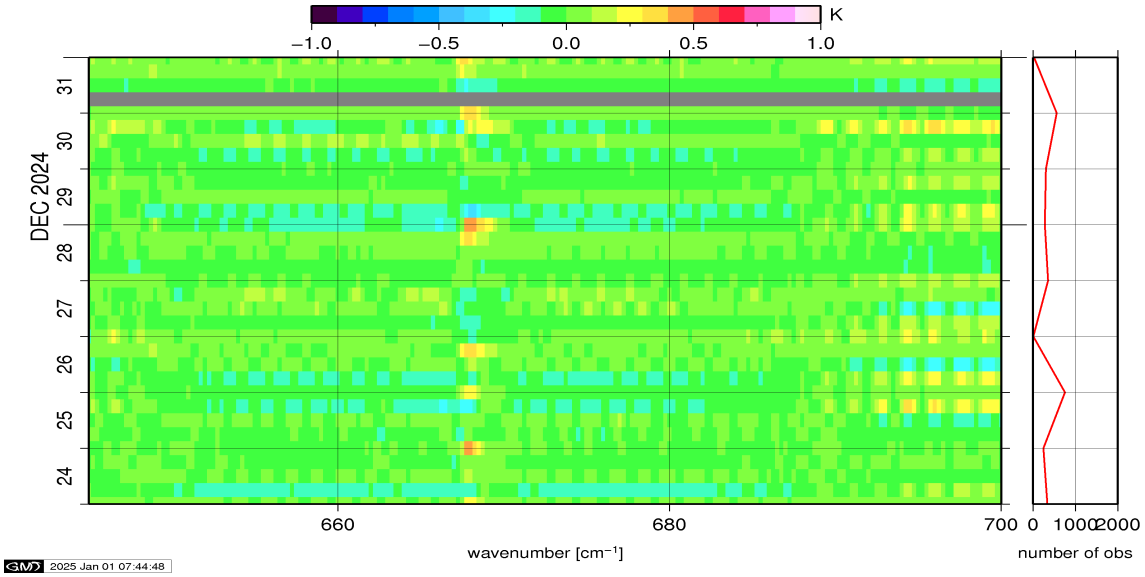

Figure 14: Radiance Anomaly in BT: CO2 14

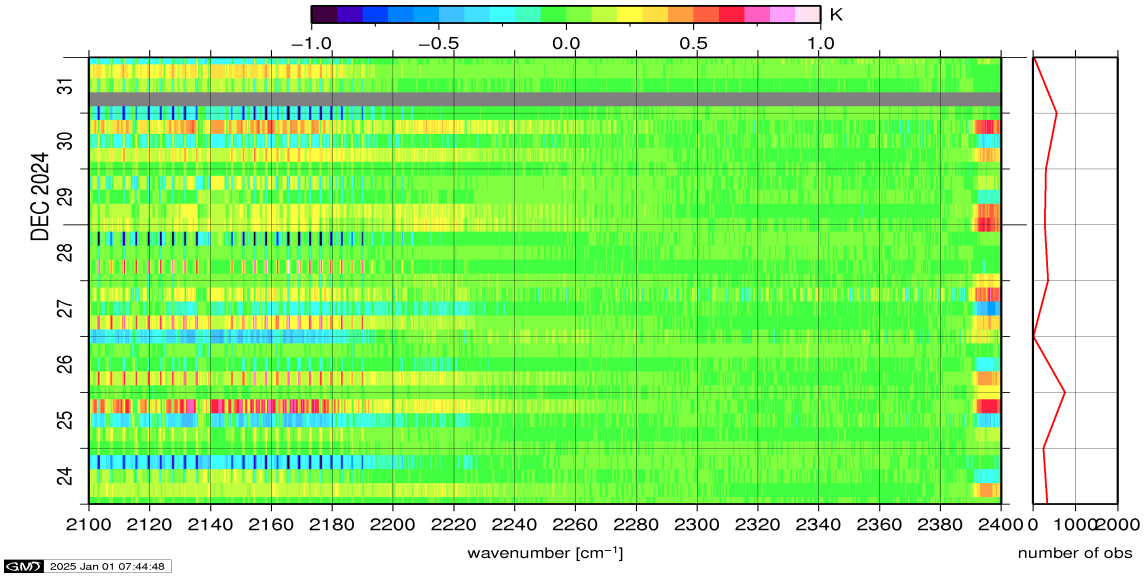

Figure 15: Radiance Anomaly in BT: CO2 4.3

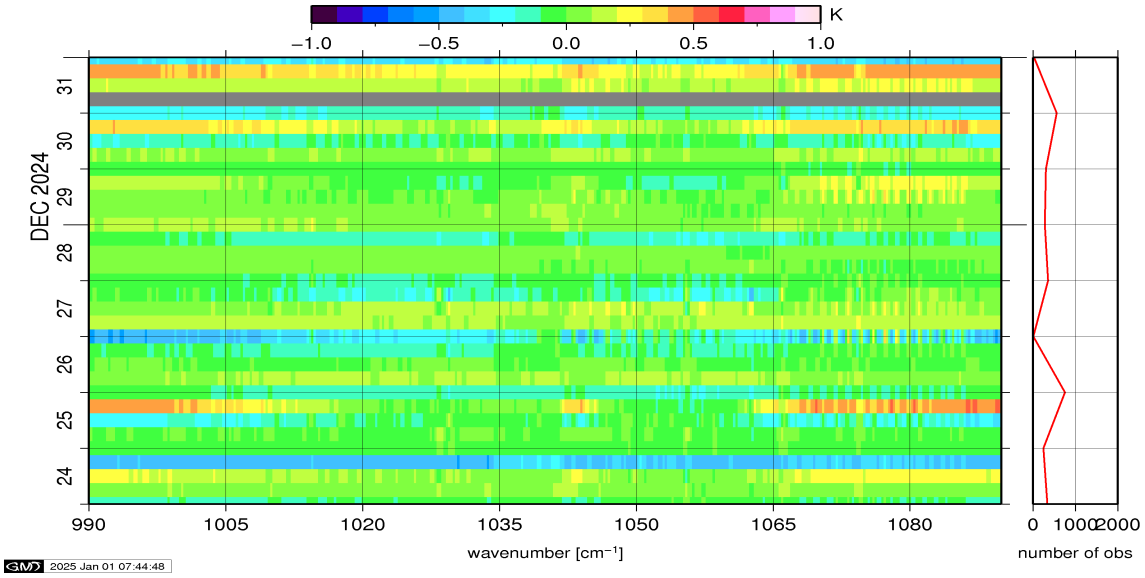

Figure 16: Radiance Anomaly in BT: O3

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.

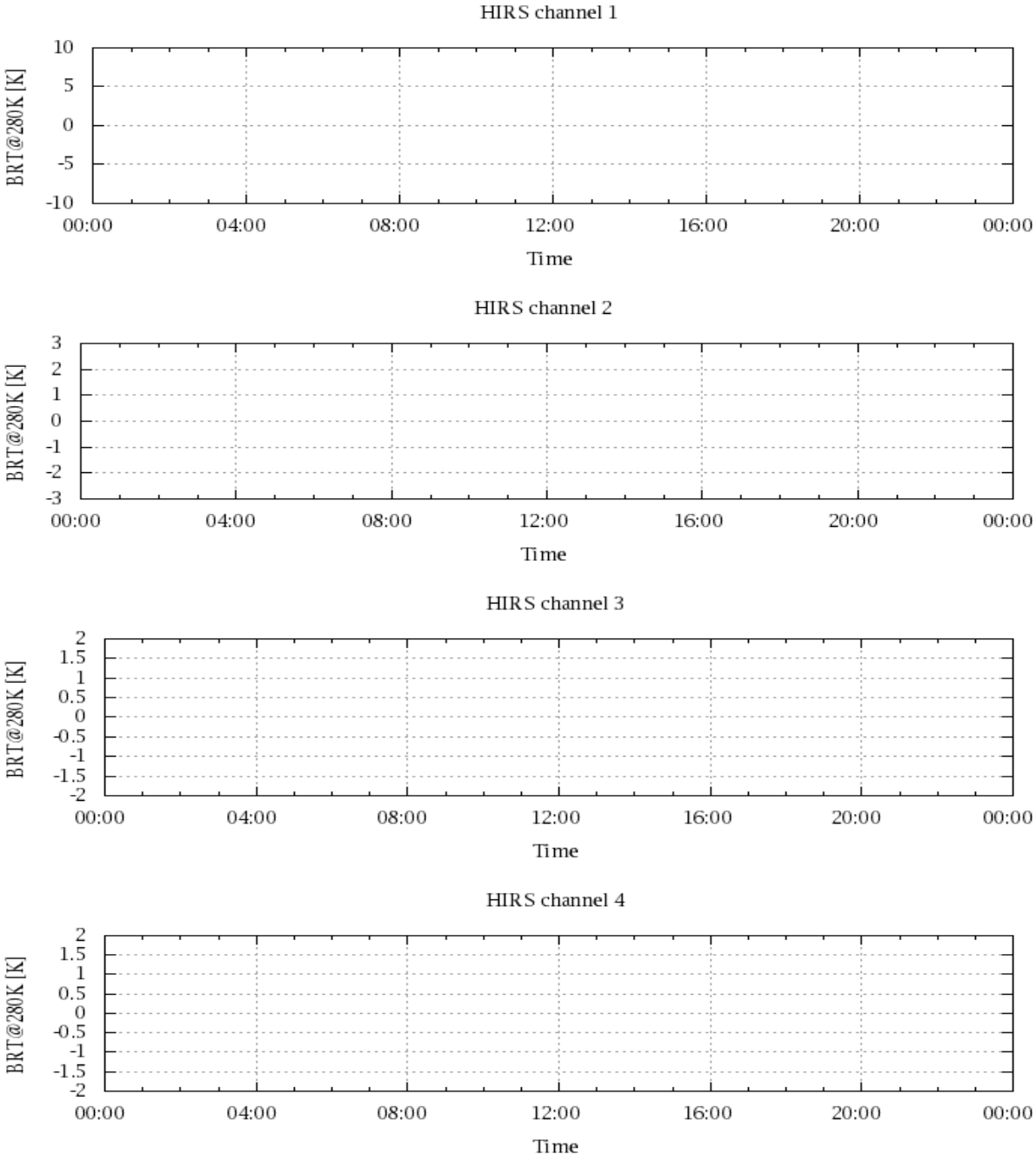

Figure 17: Radiance Differences in BT

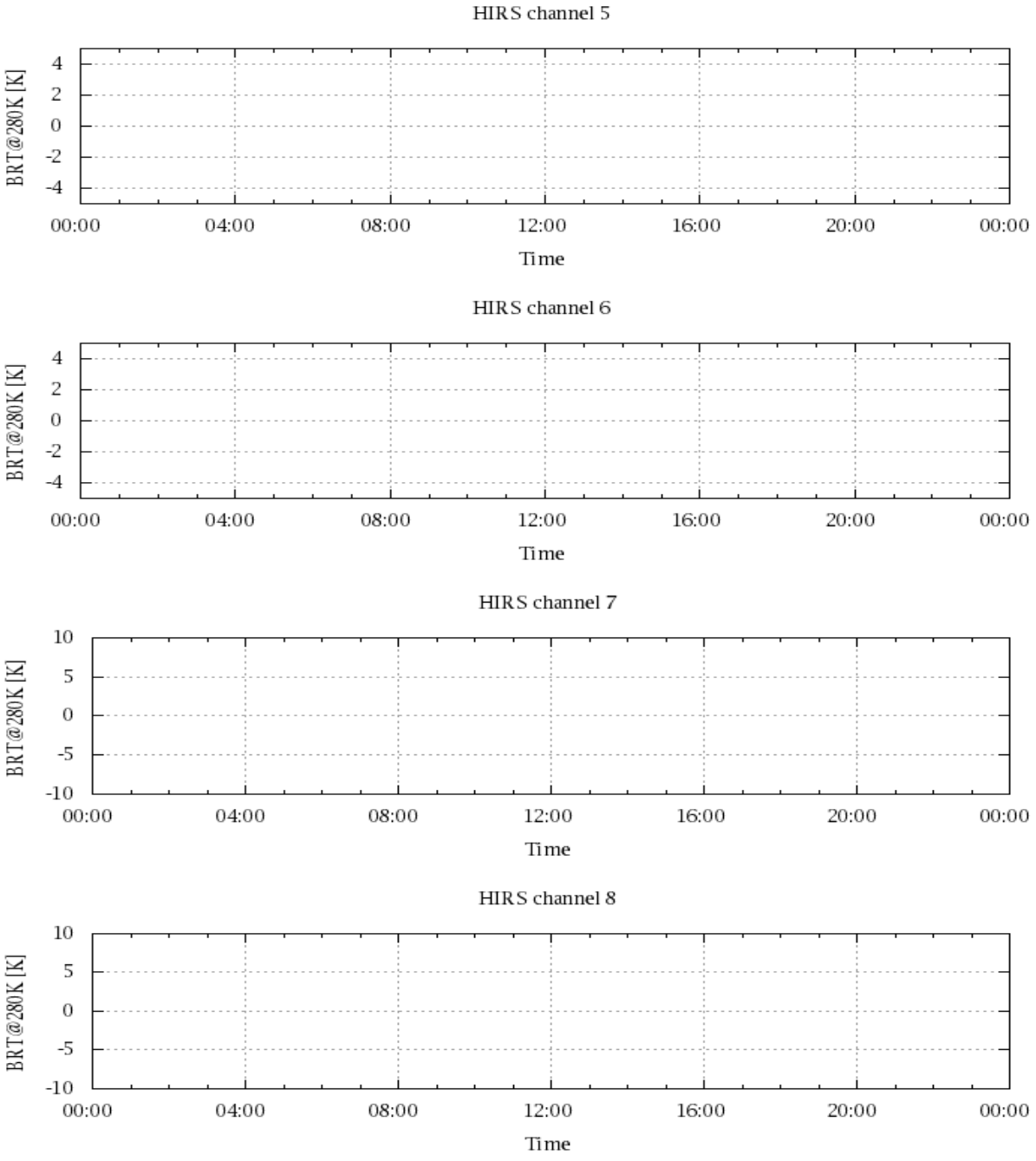

Figure 18: Radiance Differences in BT

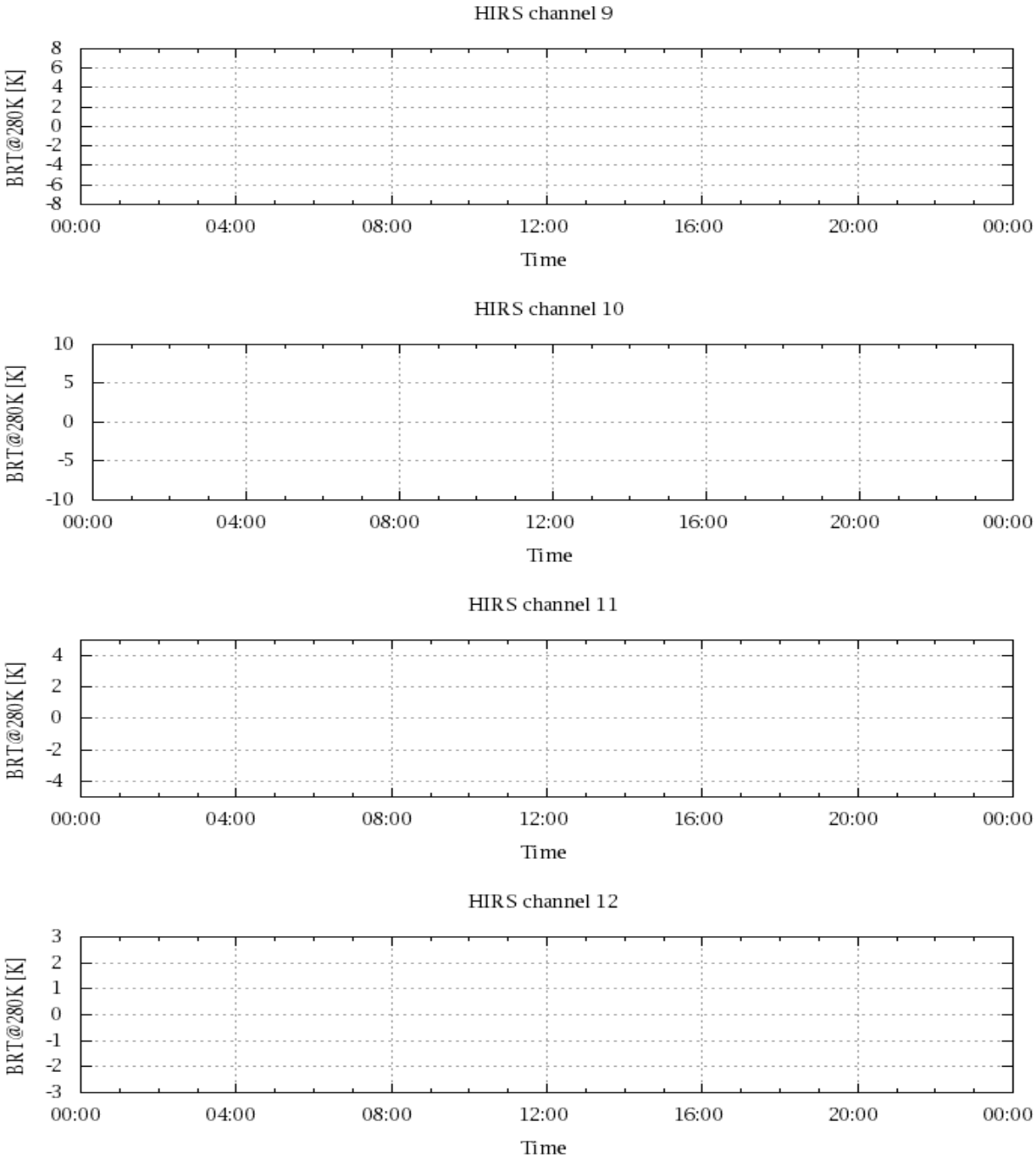

Figure 19: Radiance Differences in BT

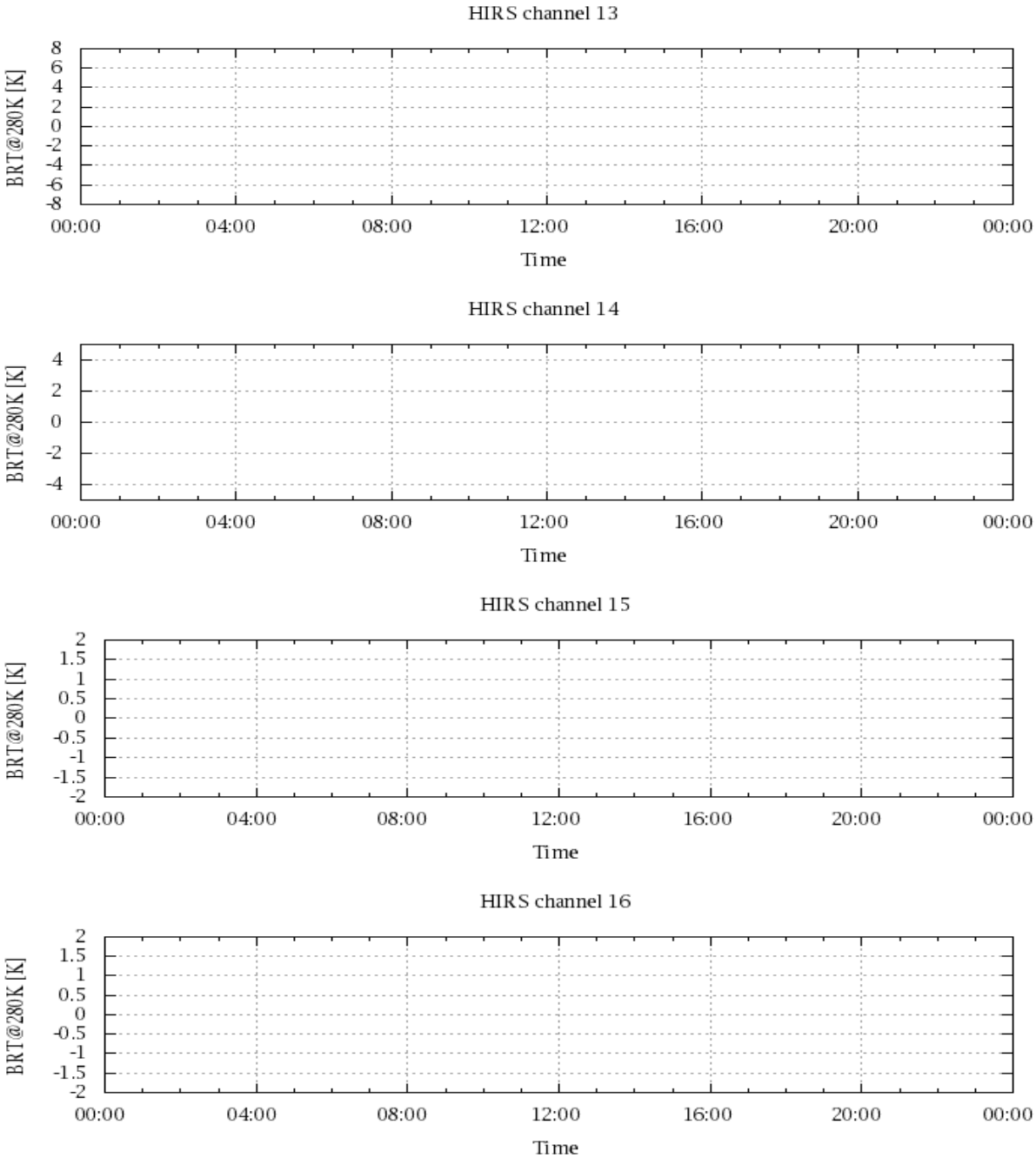

Figure 20: Radiance Differences in BT

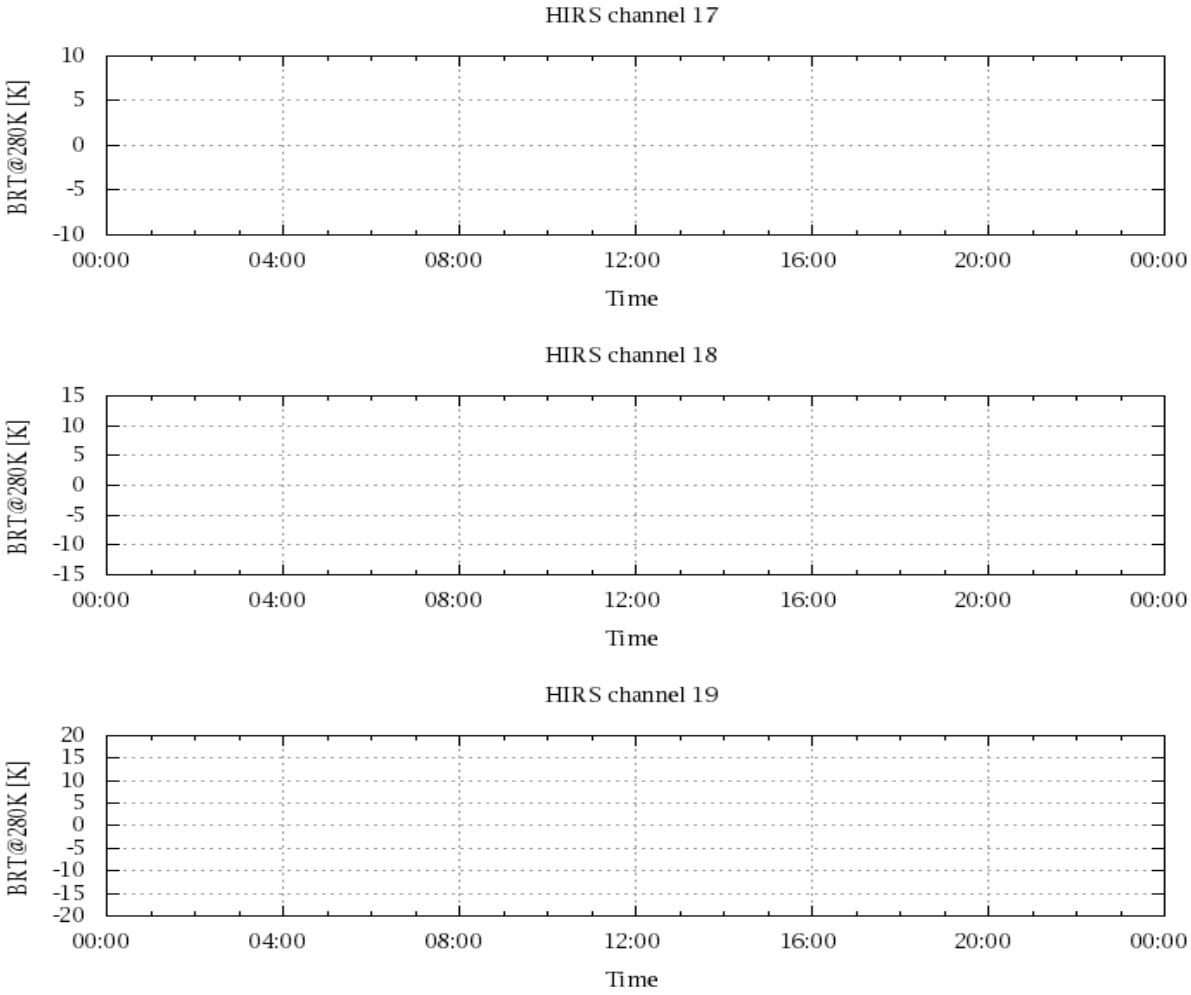

Figure 21: Radinace Differences in BT