

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

IASI monitoring team

08/12/2020 00:00:00 - 09/12/2020 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 08/12/2020 00:00:00 - 09/12/2020 00:00:00 .

The monitoring data are extracted on PDU basis.

2 Data quantity 08/12/2020 00:00:00 - 09/12/2020 00:00:00

Product Type	Number	Action
L0 HKTM PDUs	481	-
L0 IASI PDUs	463	-
L1 ENG PDUs	462	-
L1 ENG distinct GEPSGranule	443	a
L1 DPX PDUs (RM: IASI-HIRS)	0	e
L1 DPS Files (RM: OBS-CAL NWP based)	462	-

Table 1: Data quantity

APID	Seq from	Seq to	Time from	Time to
PX1 (130)	6260	0	20201208132002.346	20201208141524.080
PX2 (135)	6260	0	20201208132002.346	20201208141524.080
PX3 (140)	6260	0	20201208132002.346	20201208141524.080
PX4 (145)	6260	0	20201208132002.346	20201208141524.080
IMG (150)	7784	0	20201208132002.346	20201208141524.080
VER (160)	10101	0	20201208132002.346	20201208141530.349
VER (160)	1829	2170	20201208150410.338	20201208151358.212
VER (160)	2170	2175	20201208151358.212	20201208151358.212
VER (160)	2175	2180	20201208151358.212	20201208151358.212
VER (160)	2180	2185	20201208151358.212	20201208151358.212
VER (160)	2185	2190	20201208151358.212	20201208151358.212
VER (160)	2190	2171	20201208151358.212	20201208151358.212
VER (160)	2171	2176	20201208151358.212	20201208151358.212
VER (160)	2176	2181	20201208151358.212	20201208151358.212
VER (160)	2181	2186	20201208151358.212	20201208151358.212
VER (160)	2186	2191	20201208151358.212	20201208151358.212
VER (160)	2191	2172	20201208151358.212	20201208151358.212
VER (160)	2172	2177	20201208151358.212	20201208151358.212
VER (160)	2177	2182	20201208151358.212	20201208151358.212

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Table 2 – continued from previous page

APID	Seq from	Seq to	Time from	Time to
VER (160)	2182	2187	20201208151358.212	20201208151358.212
VER (160)	2187	2192	20201208151358.212	20201208151358.212
VER (160)	2192	2173	20201208151358.212	20201208151358.212
VER (160)	2173	2178	20201208151358.212	20201208151358.212
VER (160)	2178	2183	20201208151358.212	20201208151358.212
VER (160)	2183	2188	20201208151358.212	20201208151358.212
VER (160)	2188	2193	20201208151358.212	20201208151358.212
VER (160)	2193	2174	20201208151358.212	20201208151358.212
VER (160)	2174	2179	20201208151358.212	20201208151358.212
VER (160)	2179	2184	20201208151358.212	20201208151358.212
VER (160)	2184	2189	20201208151358.212	20201208151358.212
VER (160)	2189	2194	20201208151358.212	20201208151358.212
AUX (180)	8572	0	20201208131954.779	20201208141530.783

Table 2: L0 data gaps

3 Instrument modes

Time	Transition from	Transition to
08/12/2020 00:00:15	-	Normal operation
08/12/2020 13:20:15	Normal operation	Auxiliary ASE synchronised
08/12/2020 13:21:19	Auxiliary ASE synchronised	Heater 2
08/12/2020 13:22:07	Heater 2	Heater 1 warm up
08/12/2020 13:23:11	Heater 1 warm up	Heater 2
08/12/2020 13:54:07	Heater 2	Auxiliary ASE synchronised
08/12/2020 14:15:11	Auxiliary ASE synchronised	Normal operation

Table 3: Instrument modes

4 L0 and L1 Data Quality

Flag	Value	Action
L0 IASI PDUs	463	-
L1 ENG PDUs	462	-
L1 ENG distinct GEPSGranule	443	a
GQisFlagQual set (PX1)	99.62 %	-
GQisFlagQual set (PX2)	99.70 %	-
GQisFlagQual set (PX3)	99.71 %	-
GQisFlagQual set (PX4)	99.63 %	-
GQisFlagQual set (all)	99.66 %	-

Table 4: Quality flags

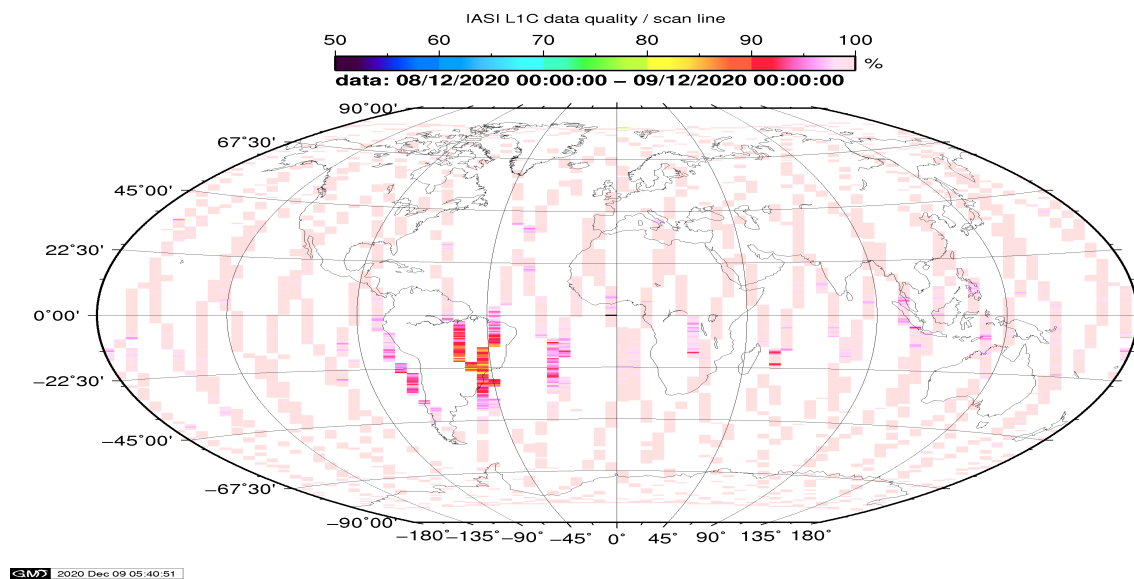


Figure 1: L1C data quality

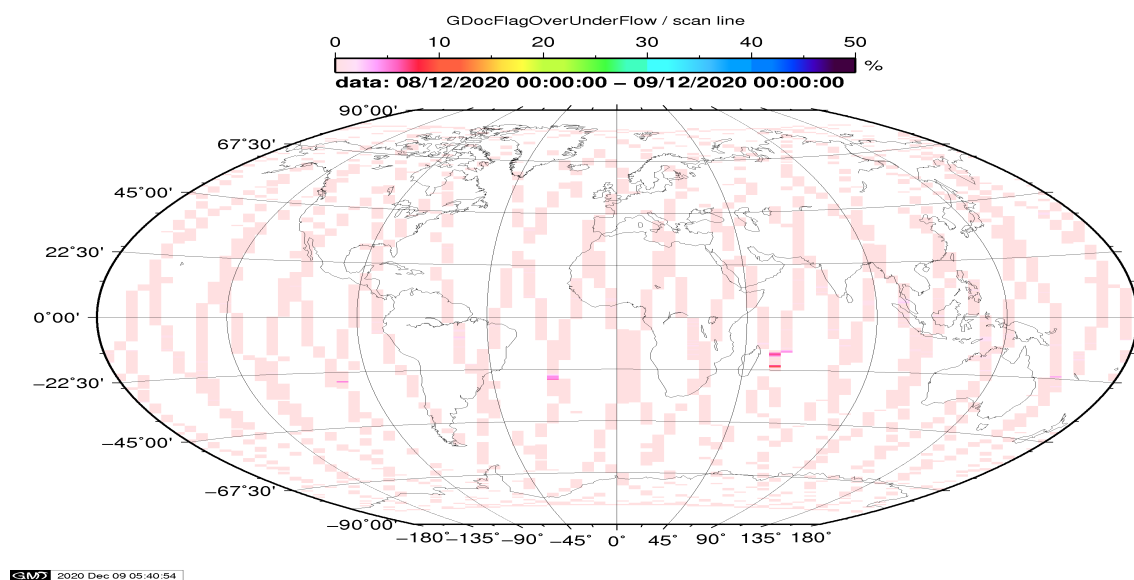


Figure 2: Flag of Over and Under Flows

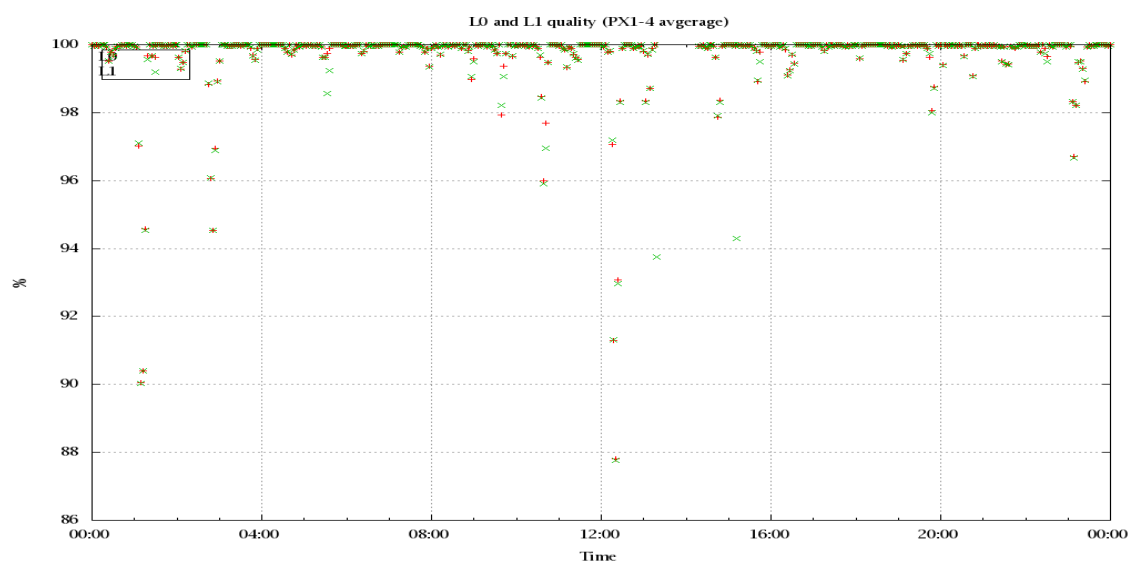


Figure 3: Level 0 and 1C overall quality

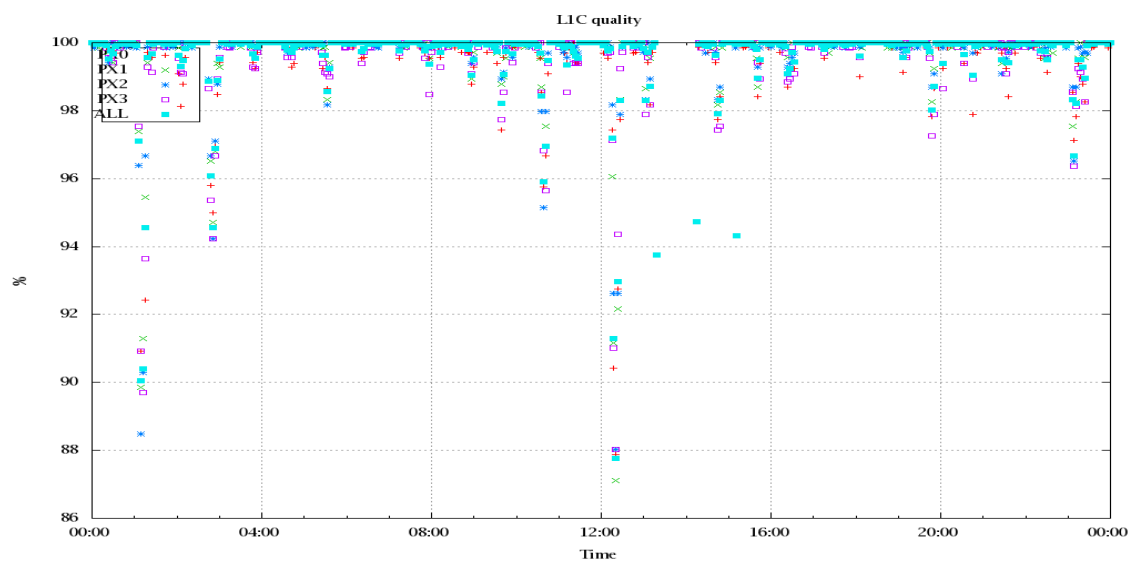


Figure 4: Level 1C quality

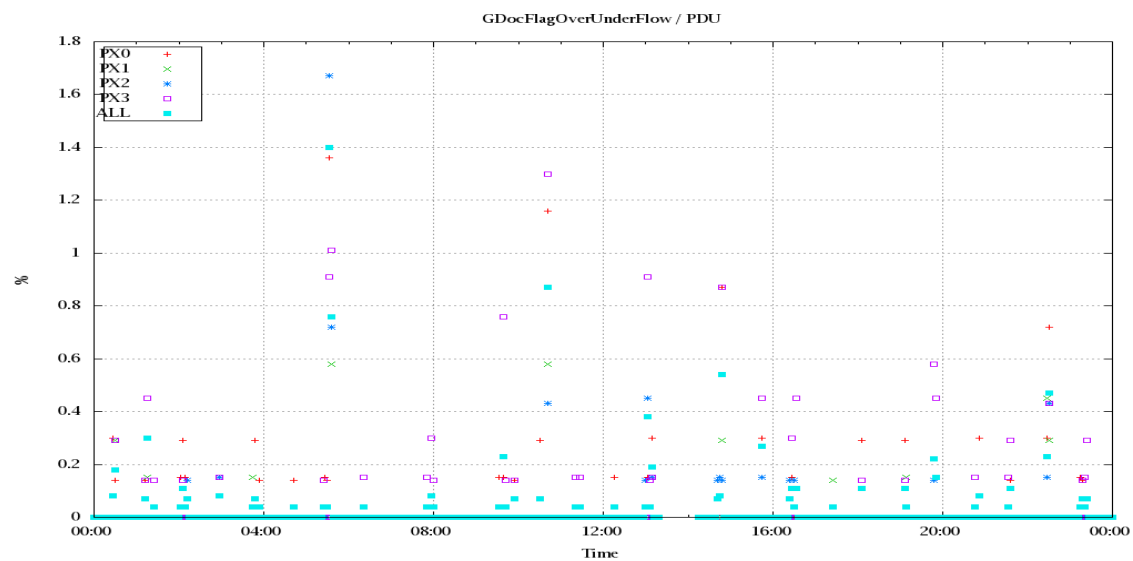


Figure 5: Timeseries of flag of Over and Under Flows

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.

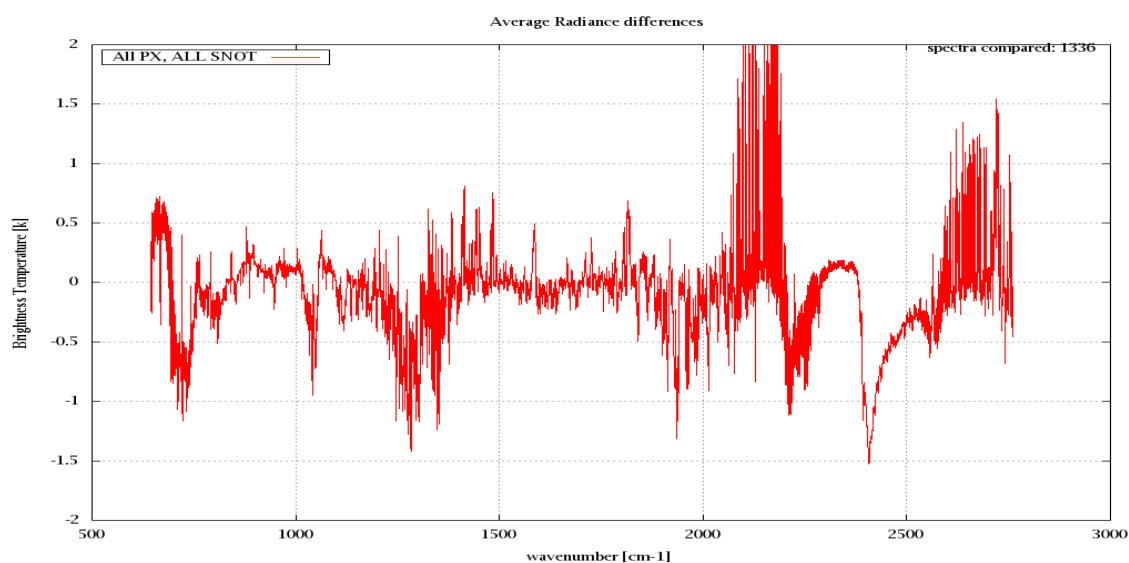


Figure 6: Average Radiance differences: OBS-CAL

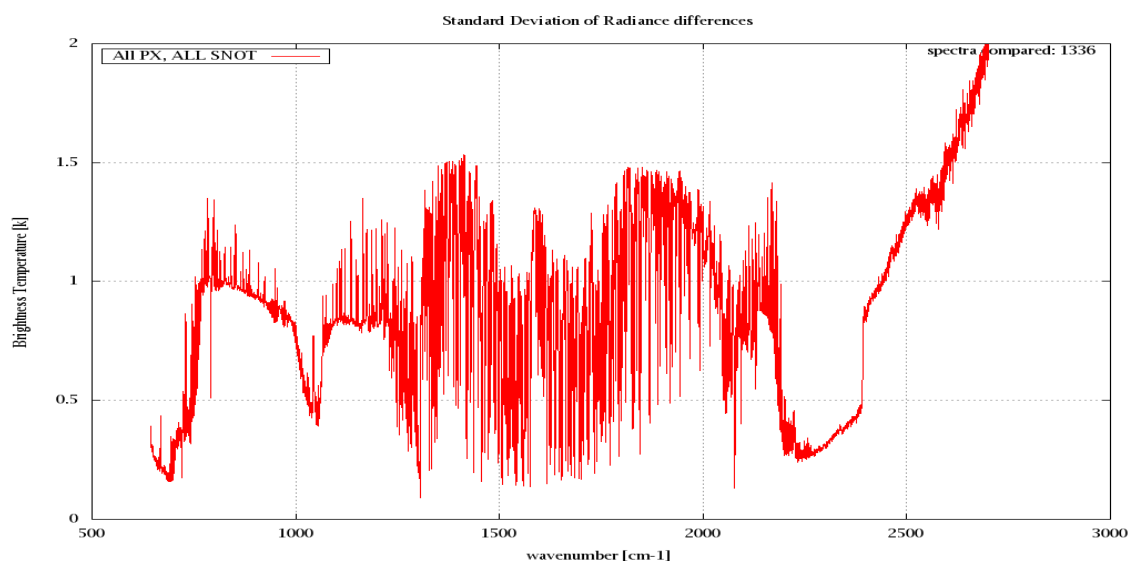


Figure 7: Standard Deviation of Radiance differences

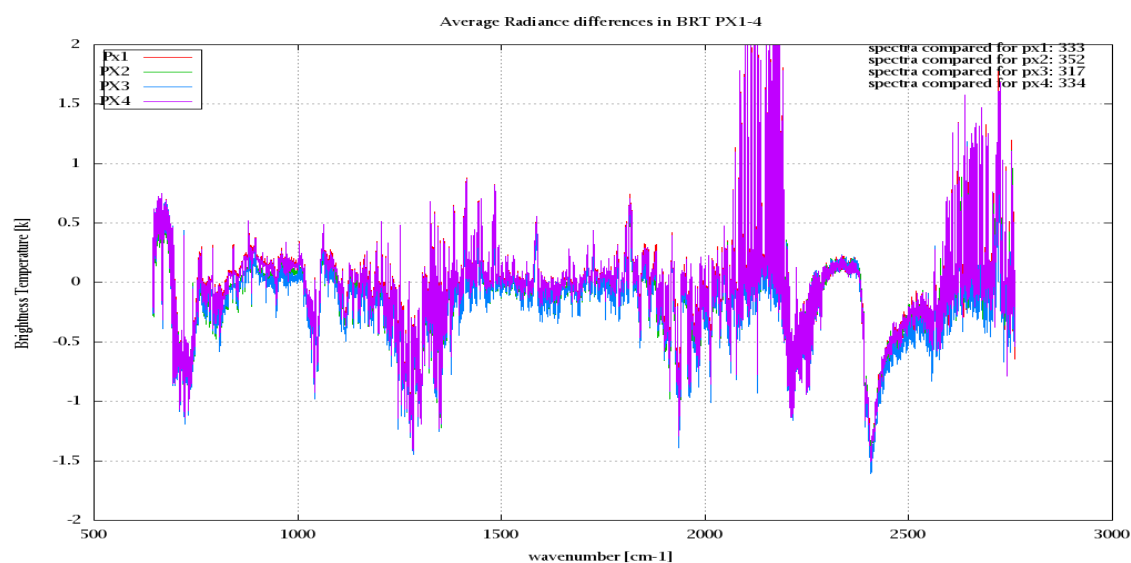


Figure 8: Average Radiance differences: OBS-CAL

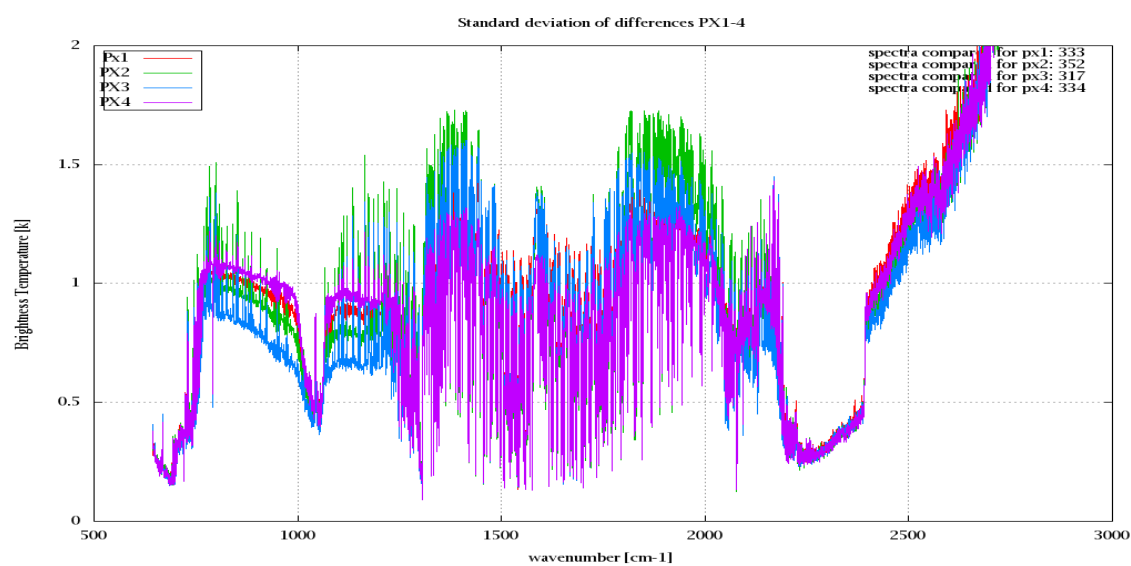


Figure 9: Standard Deviation of Radiance differences

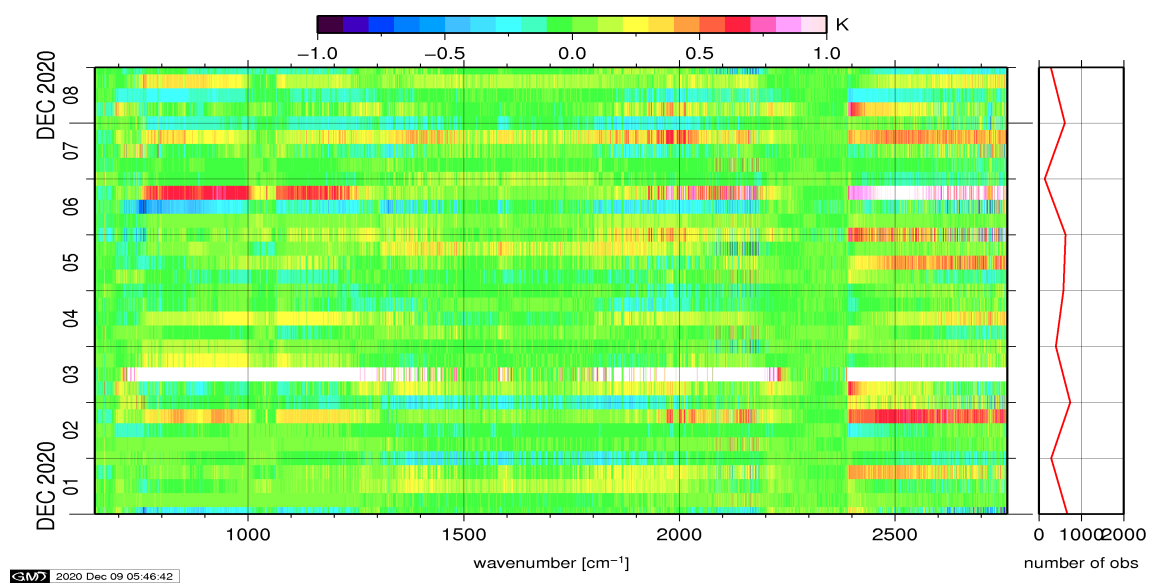


Figure 10: Radiance Anomaly in BT: All Channels

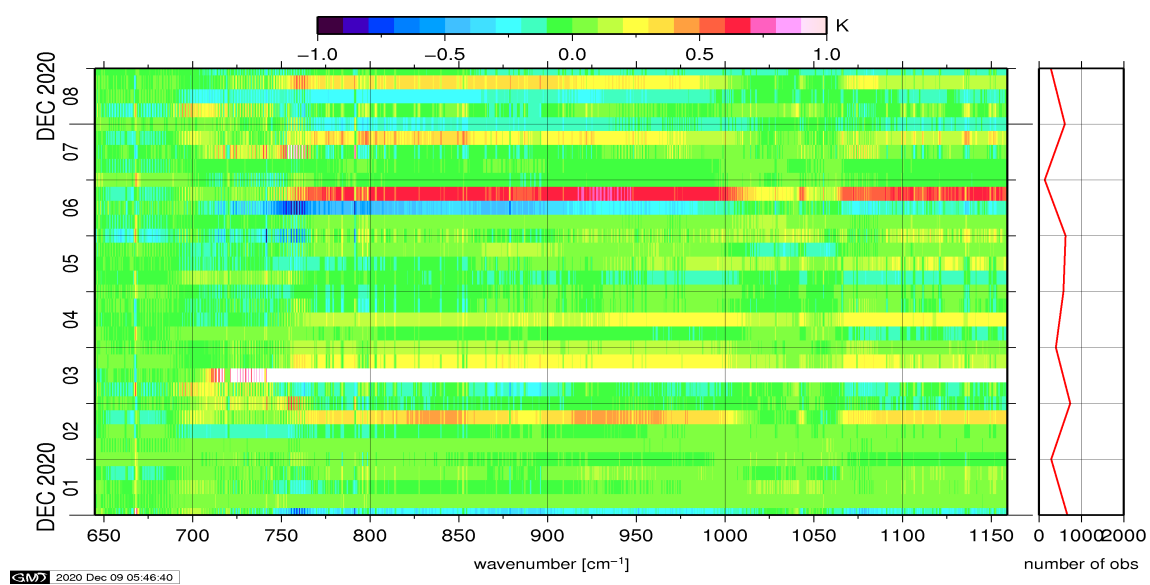


Figure 11: Radiance Anomaly in BT: IASI Band 1

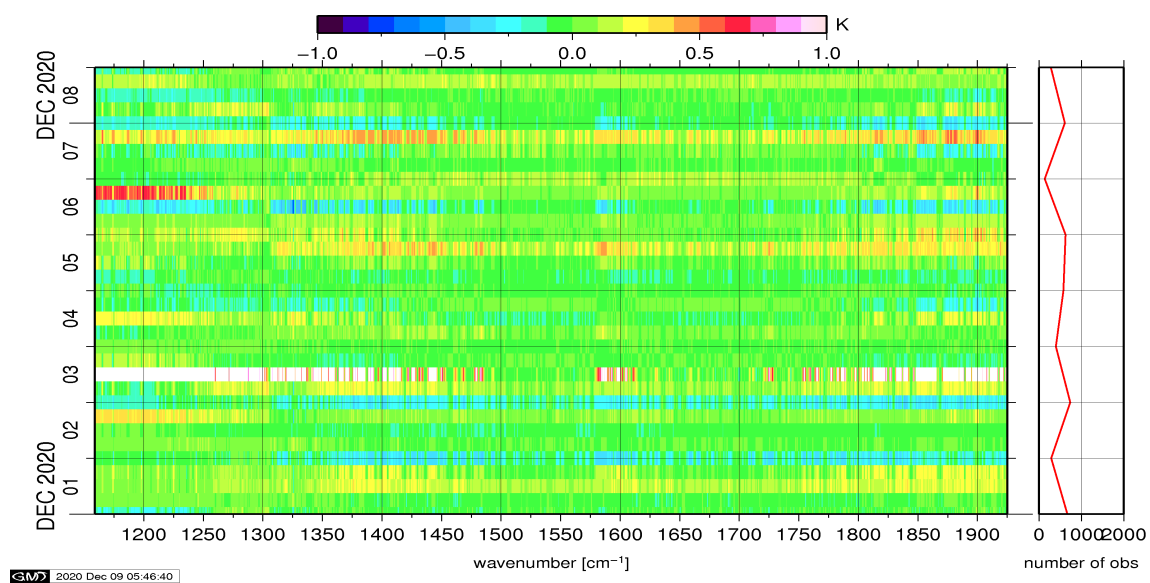


Figure 12: Radiance Anomaly in BT: IASI Band 2

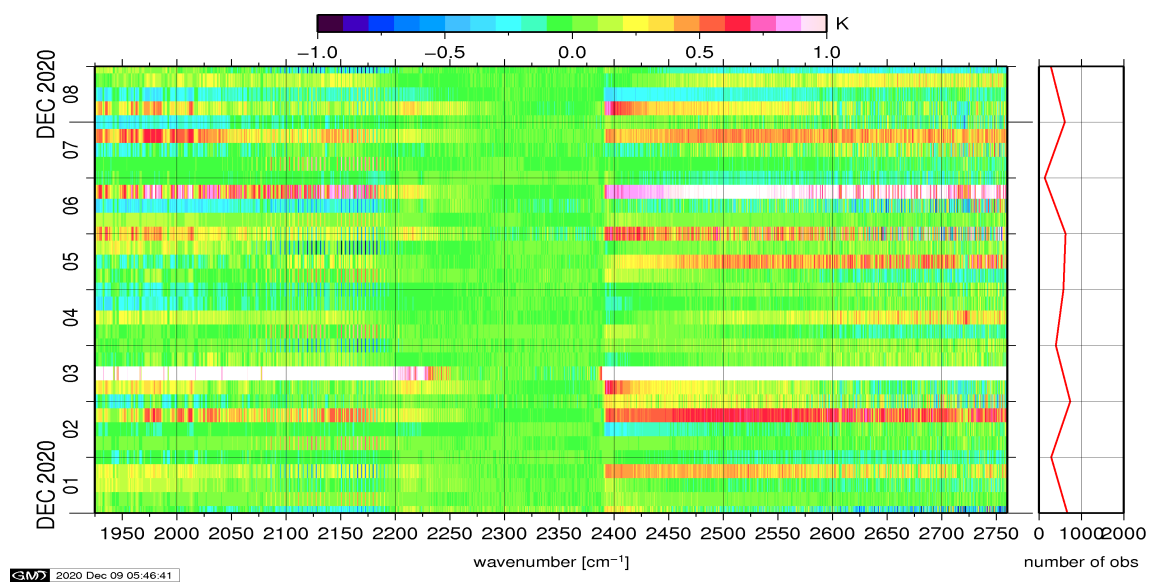


Figure 13: Radiance Anomaly in BT: IASI Band 3

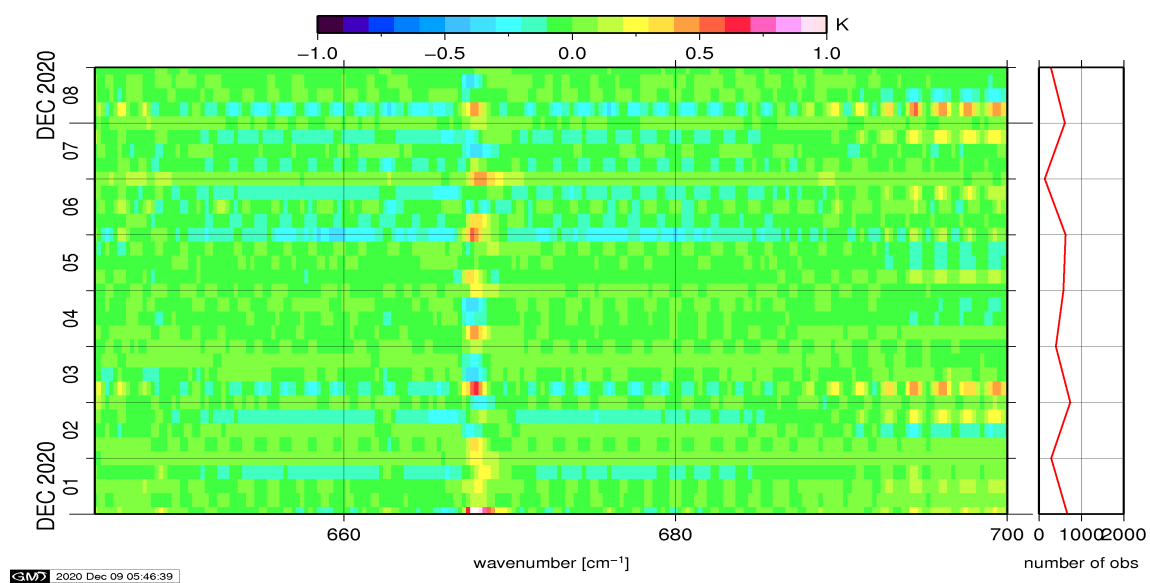


Figure 14: Radiance Anomaly in BT: CO2 14

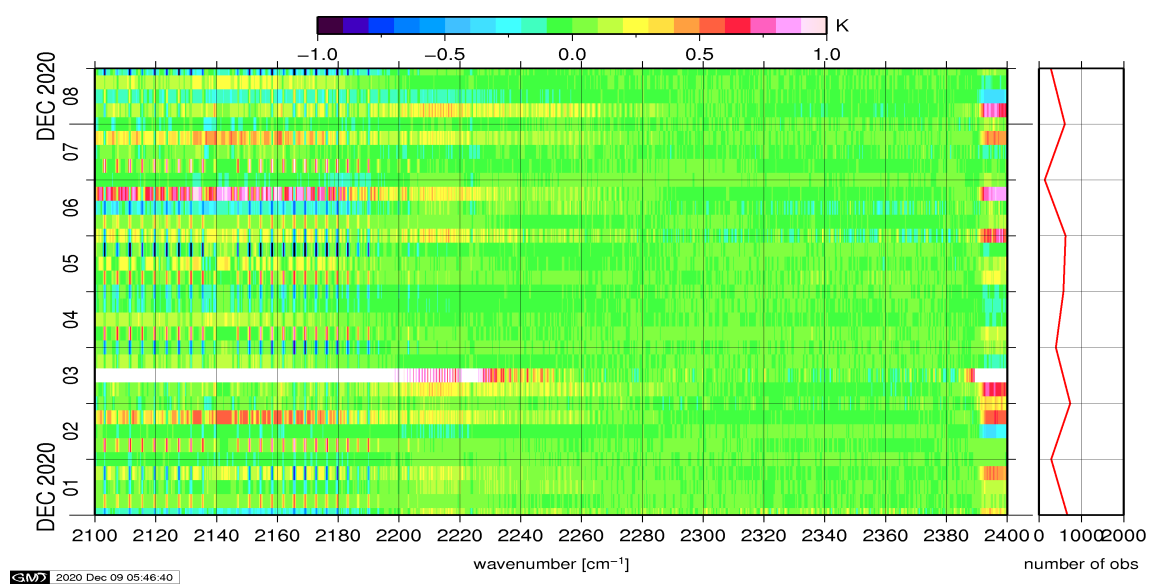


Figure 15: Radiance Anomaly in BT: CO2 4.3

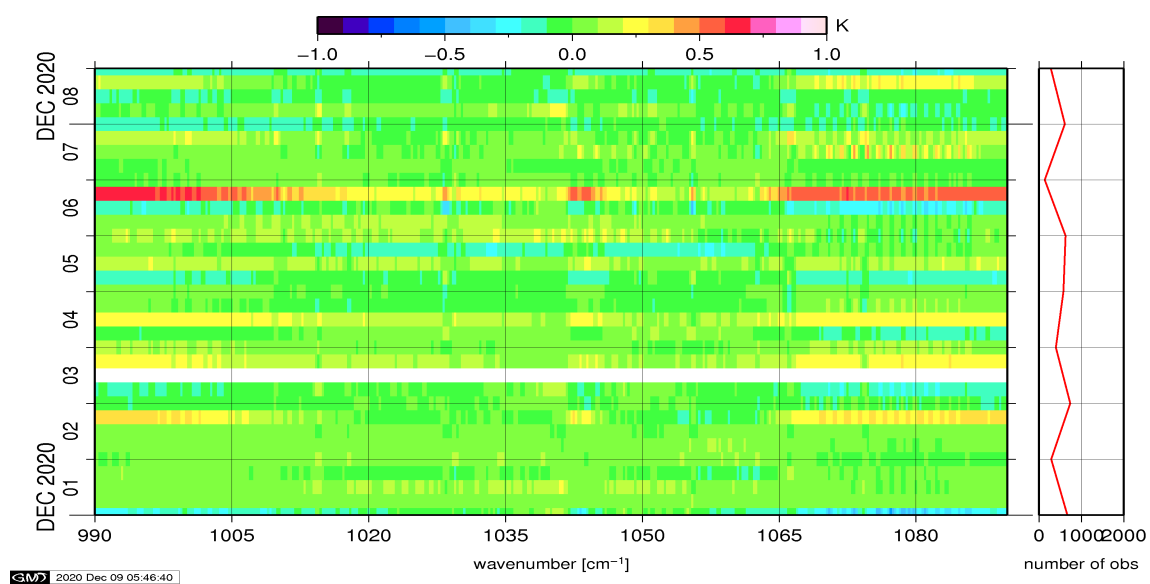


Figure 16: Radiance Anomaly in BT: O3

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.

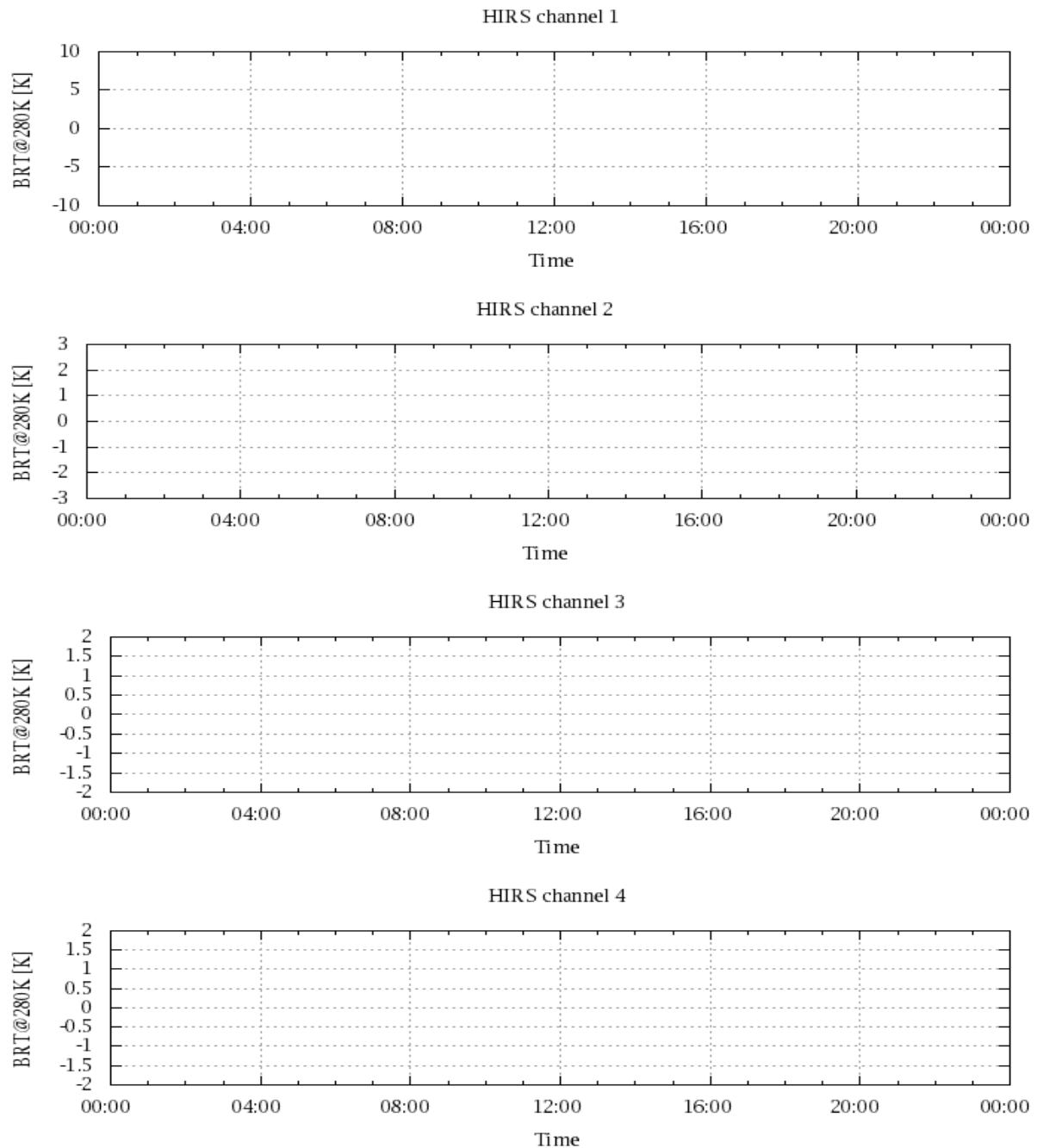


Figure 17: Radiance Differences in BT



Figure 18: Radiance Differences in BT



Figure 19: Radiance Differences in BT



Figure 20: Radiance Differences in BT



Figure 21: Radinace Differences in BT