IASI L0 and L1 Daily Monitoring Report

IASI monitoring team

10/03/2014 00:00:00 - 11/03/2014 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 minute data packet) for 10/03/2014 00:00:00 - 11/03/2014 00:00:00 .

The monitoring data are extracted on PDU basis.

Data extraction, calibration, processing and statictics are performed at EUMETSAT.

2   Data quantity 10/03/2014 00:00:00 - 11/03/2014 00:00:00

Product Type	Number	Action
L0 HKTM PDUs	481	-
L0 IASI PDUs	171	e
L1 ENG PDUs	170	e
L1 ENG distinct GEPSGranule	171	a
L1 DPX PDUs (RM: IASI-HIRS)	170	e
L1 DPS Files (RM: OBS-CAL NWP based)	170	-

Table 1: Data quantity

APID	Seq from	Seq to	Time from	Time to
PX1 (130)	13645	13647	20140310033325.563	20140310033325.996
PX1 (130)	13654	13657	20140310033327.508	20140310033328.156
PX1 (130)	13677	13682	20140310033333.992	20140310033335.074
PX1 (130)	13691	13693	20140310033337.020	20140310033337.453
PX2 (135)	13644	13646	20140310033325.344	20140310033325.777
PX2 (135)	13653	13657	20140310033327.293	20140310033328.156
PX2 (135)	13677	13682	20140310033333.992	20140310033335.074
PX2 (135)	13691	13693	20140310033337.020	20140310033337.453
PX2 (135)	13695	13697	20140310033337.887	20140310033339.832
PX3 (140)	13644	13646	20140310033325.344	20140310033325.777
PX3 (140)	13653	13657	20140310033327.293	20140310033328.156
PX3 (140)	13677	13682	20140310033333.992	20140310033335.074
PX3 (140)	13691	13693	20140310033337.020	20140310033337.453
PX3 (140)	13695	13697	20140310033337.887	20140310033339.832
PX4 (145)	13644	13646	20140310033325.344	20140310033325.777
PX4 (145)	13653	13657	20140310033327.293	20140310033328.156
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Table 2 – continued from previous page

APID	Seq from	Seq to	Time from	Time to
PX4 (145)	13677	13682	20140310033333.992	20140310033335.074
PX4 (145)	13690	13693	20140310033336.805	20140310033337.453
PX4 (145)	13695	13697	20140310033337.887	20140310033339.832
IMG (150)	6720	6722	20140310033325.344	20140310033325.777
IMG (150)	6729	6733	20140310033327.293	20140310033328.156
IMG (150)	6756	6762	20140310033333.777	20140310033335.074
IMG (150)	6770	6773	20140310033336.805	20140310033337.453
VER (160)	-	-	-	-
AUX (180)	-	-	-	-

Table 2: L0 data gaps

3 Instrument modes

Time	Transition from	Transition to
10/03/2014 00:00:15	-	Normal operation
10/03/2014 08:30:55	Normal operation	Auxiliary ASE synchronised
10/03/2014 08:31:43	Auxiliary ASE synchronised	Heater 2
10/03/2014 08:32:31	Heater 2	Heater 1 warm up
10/03/2014 08:35:27	Heater 1 warm up	Heater 1 decontamination

Table 3: Instrument modes

4 L0 and L1 Data Quality

Flag	Value	Action
L0 IASI PDUs	171	e
L1 ENG PDUs	170	e
L1 ENG distinct GEPSGranule	171	a
GQisFlagQual set (PX1)	99.51 %	-
GQisFlagQual set (PX2)	99.63 %	-
GQisFlagQual set (PX3)	99.67 %	-
GQisFlagQual set (PX4)	99.59 %	-
GQisFlagQual set (all)	99.60 %	-

Table 4: Quality flags
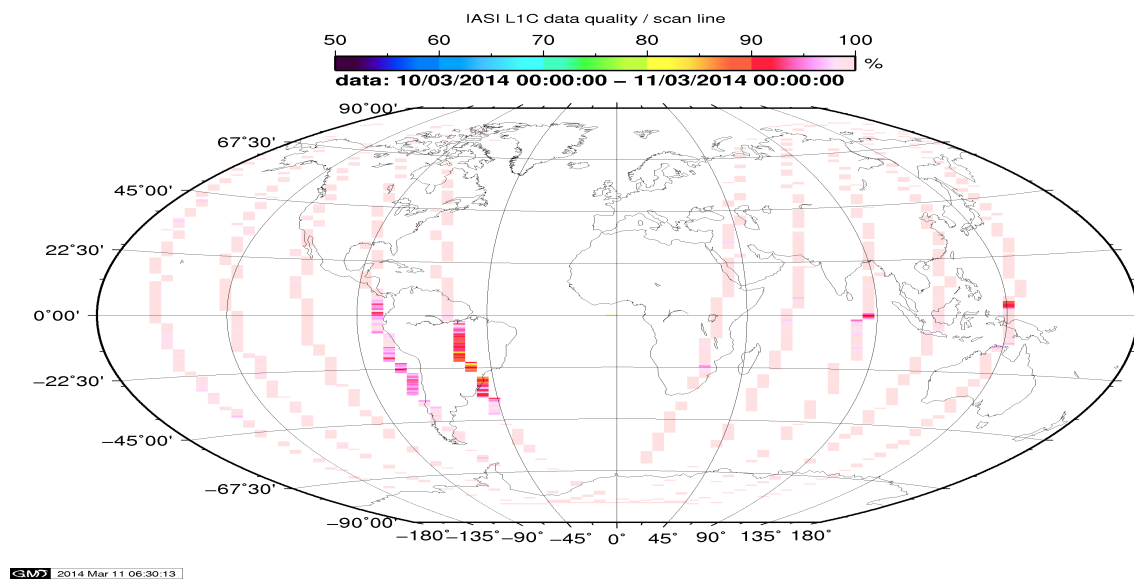
Figure 1: L1C data quality
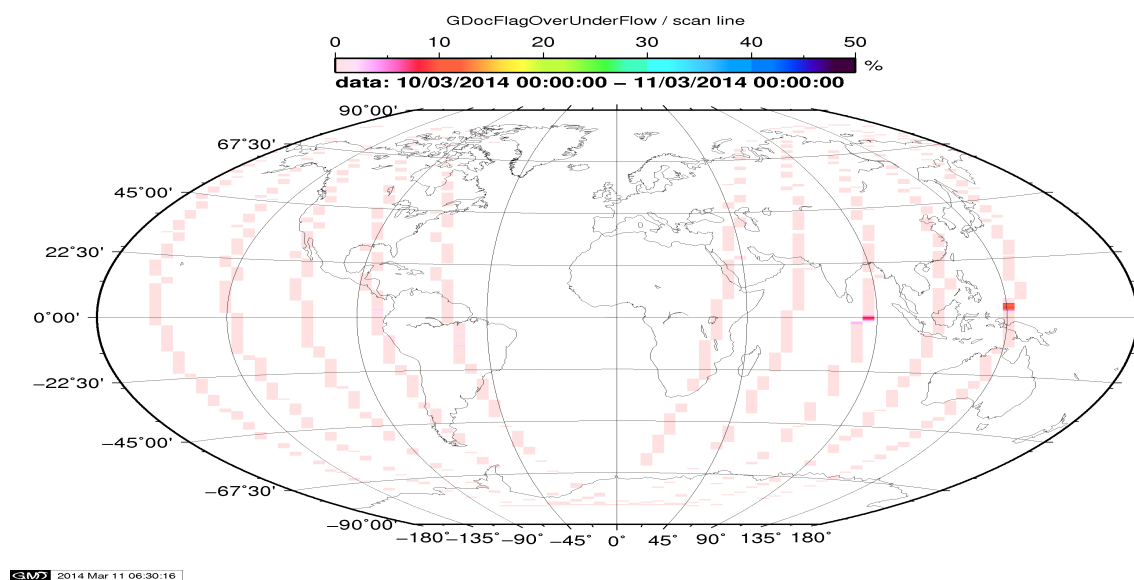
Figure 2: Flag of Over and Under Flows
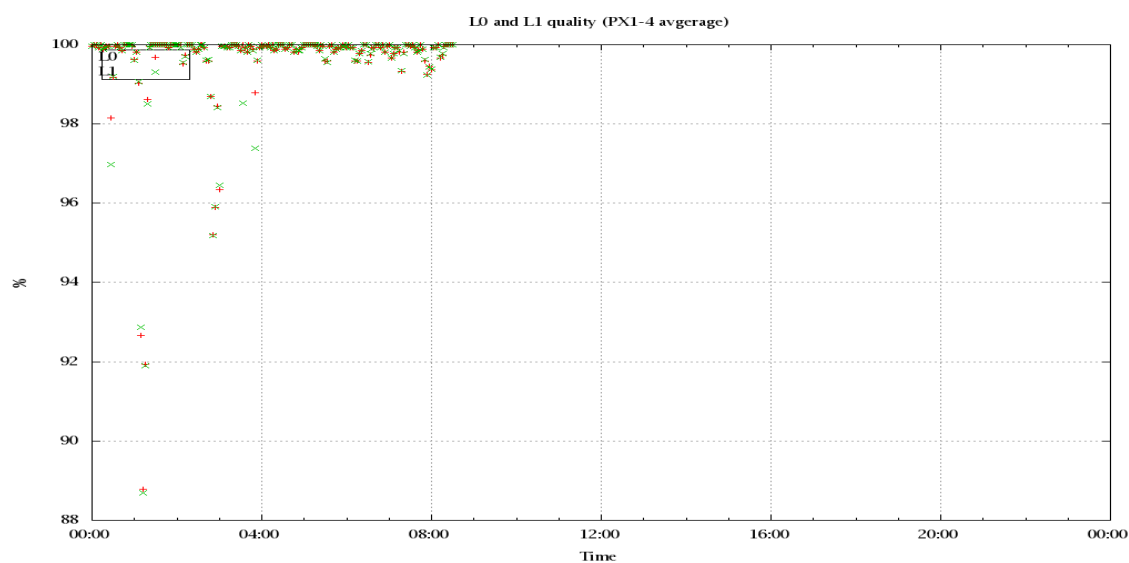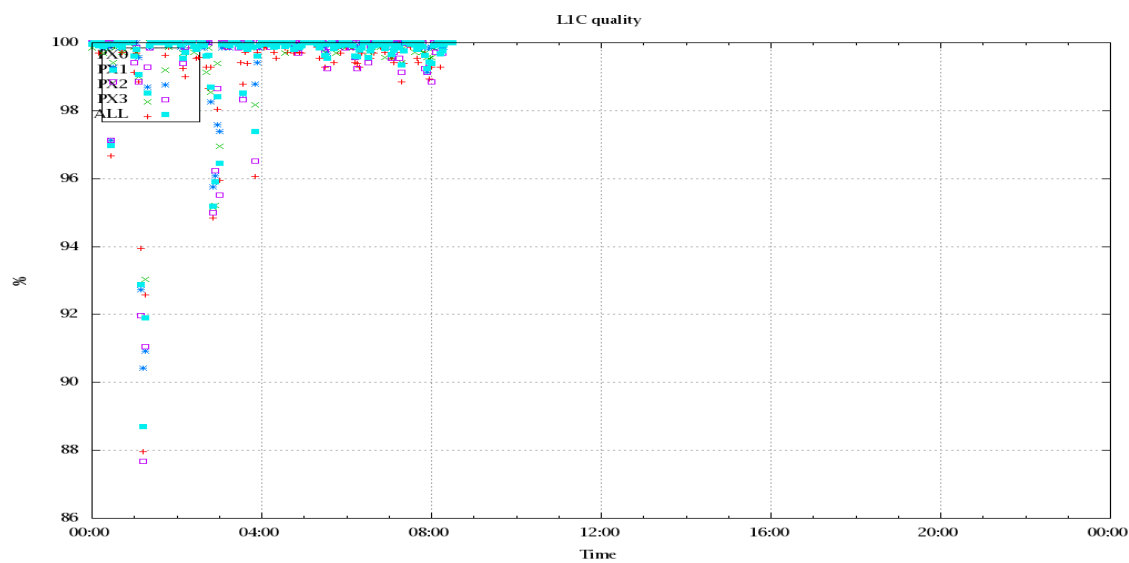
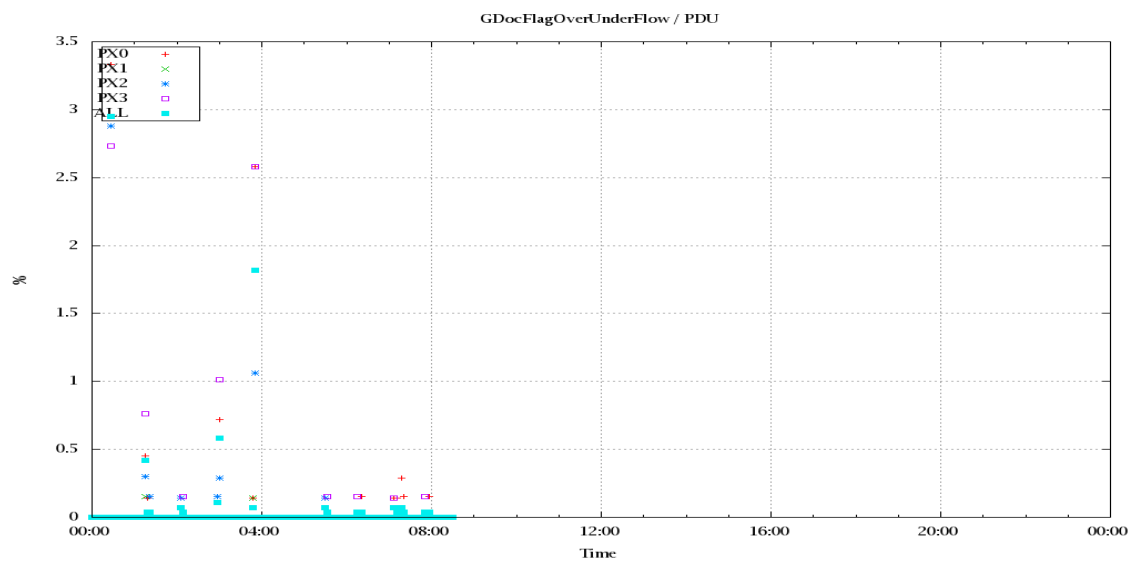Figure 3: Level 0 and 1C overall quality

Figure 4: Level 1C quality

Figure 5: OverUnderFlowFlag timeseries

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,WV, and Ozon. 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 10 to 16 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 pixel and scan position 10 to 20) and the average bias OBS-CAL (over all pixel and scan position 10 to 20) of the last 30 days.
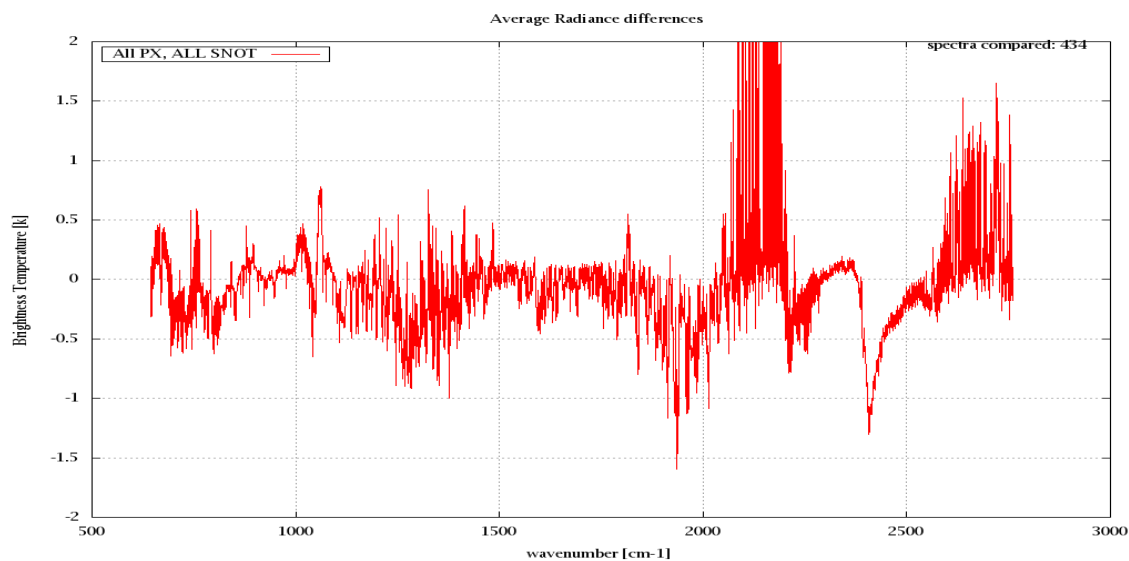
Figure 6: Average Radiance differences: OBS-CAL
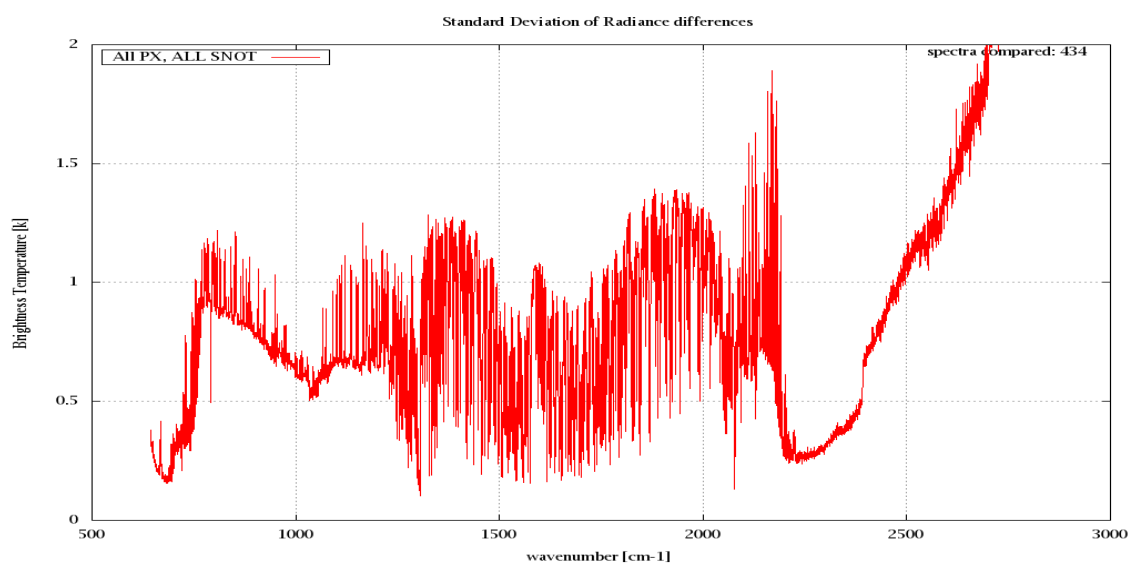

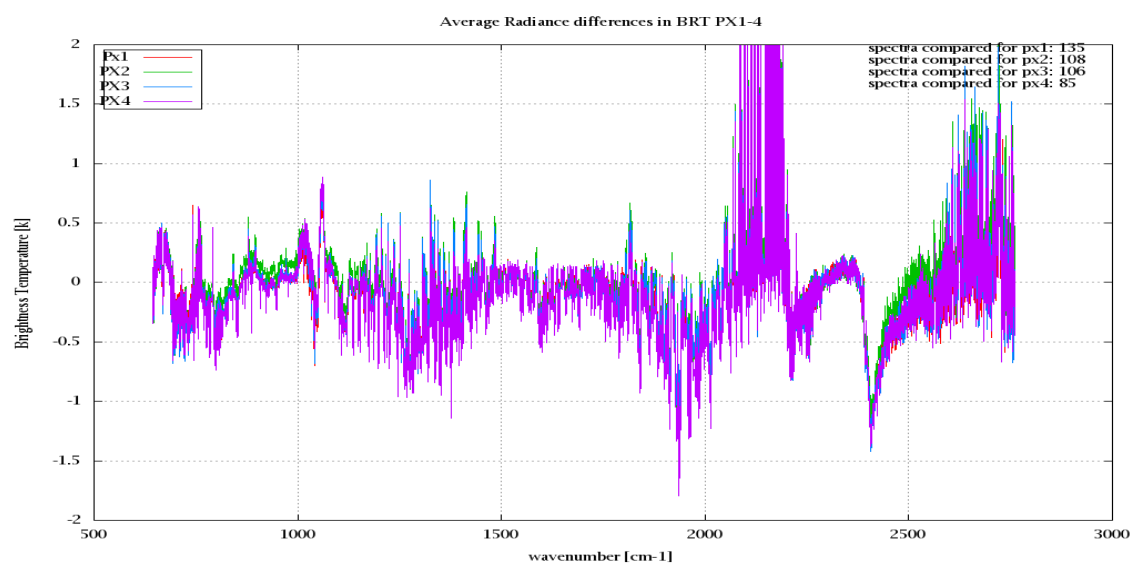Figure 7: Standard Deviation of Radiance differences

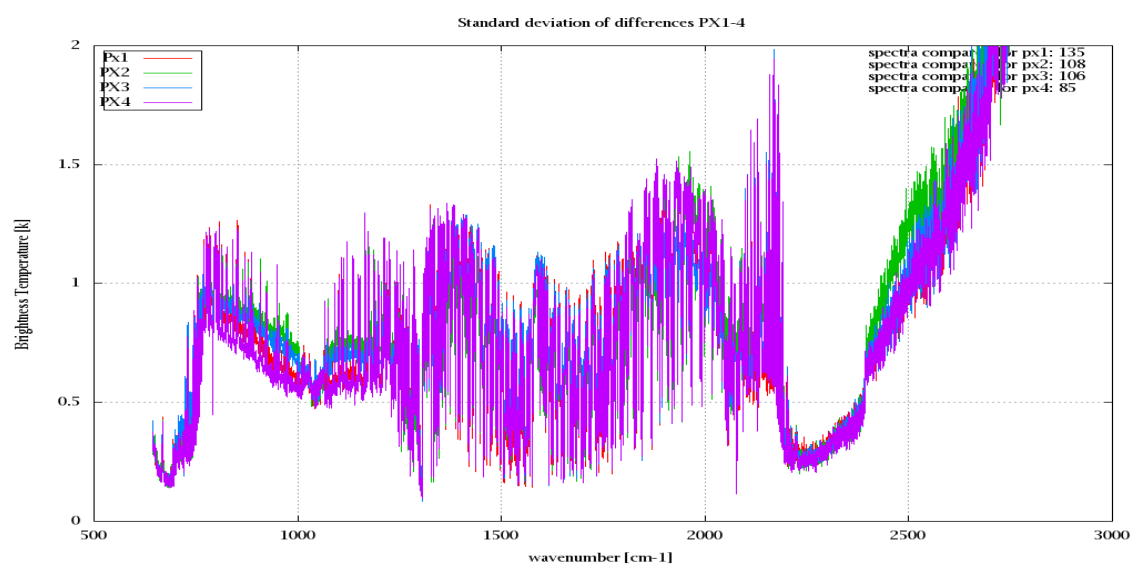Figure 8: Average Radiance differences: OBS-CAL

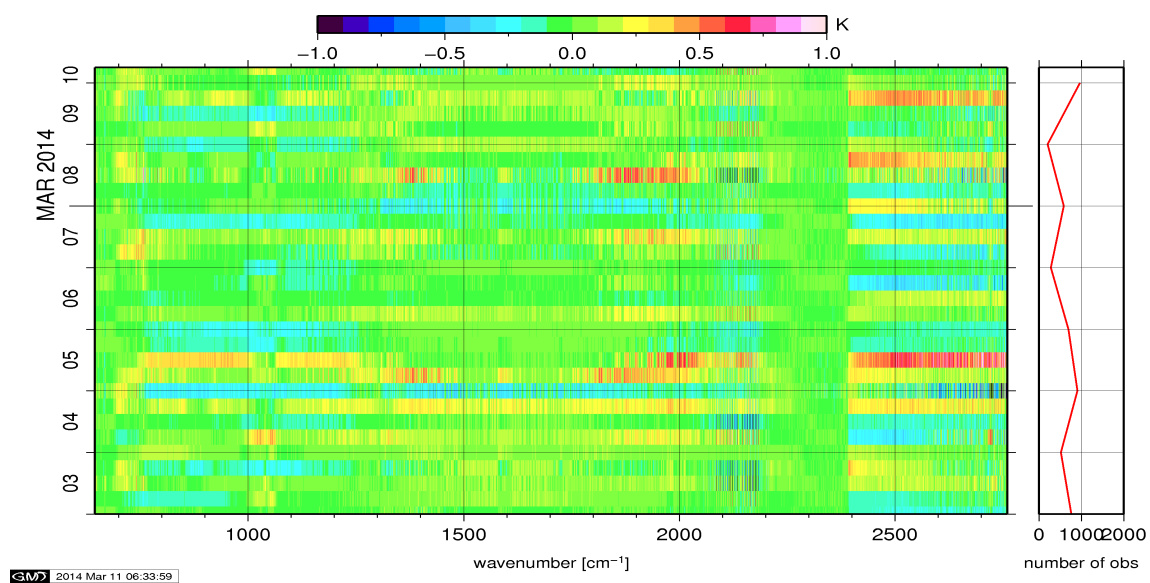Figure 9: Standard Deviation of Radiance differences

Figure 10: Radiance Anomaly in BRT: All Channels
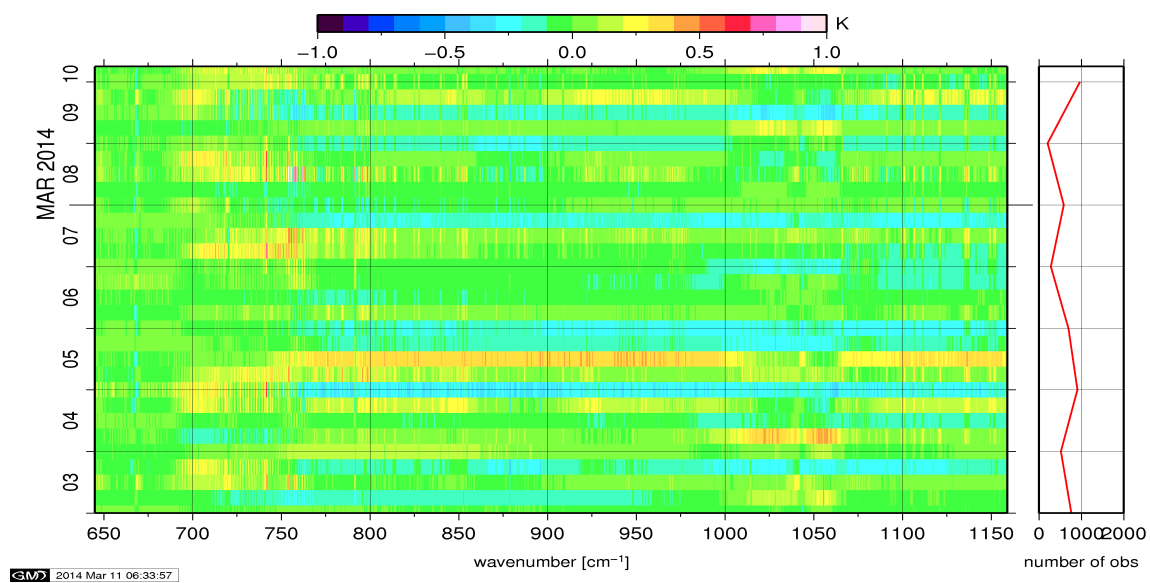

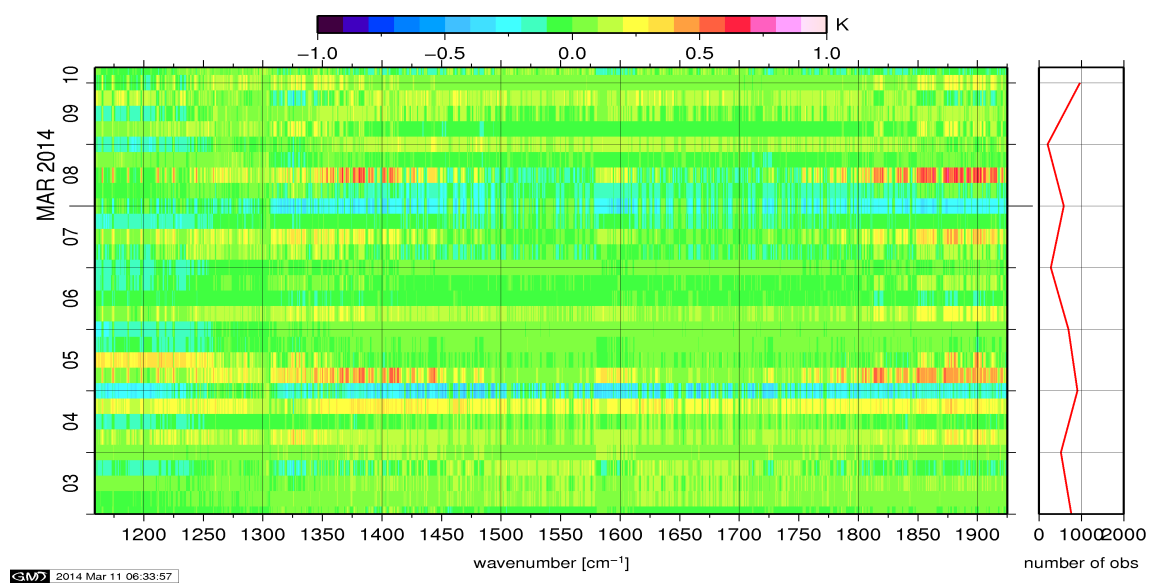Figure 11: Radiance Anomaly in BRT: IASI Band 1

Figure 12: Radiance Anomaly in BRT: IASI Band 2
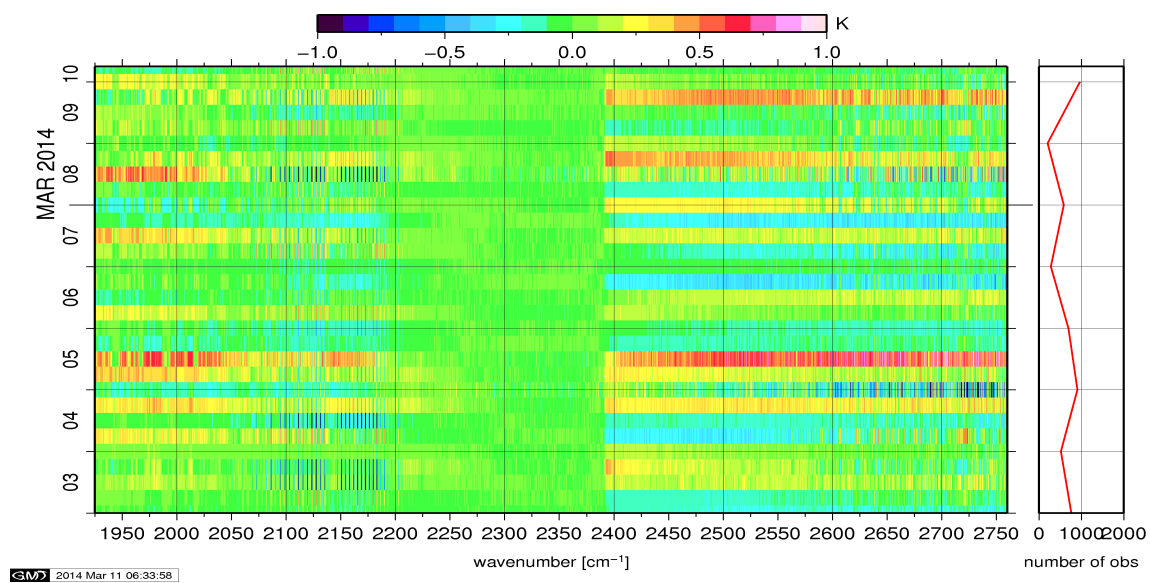

Figure 13: Radiance Anomaly in BRT: IASI Band 3
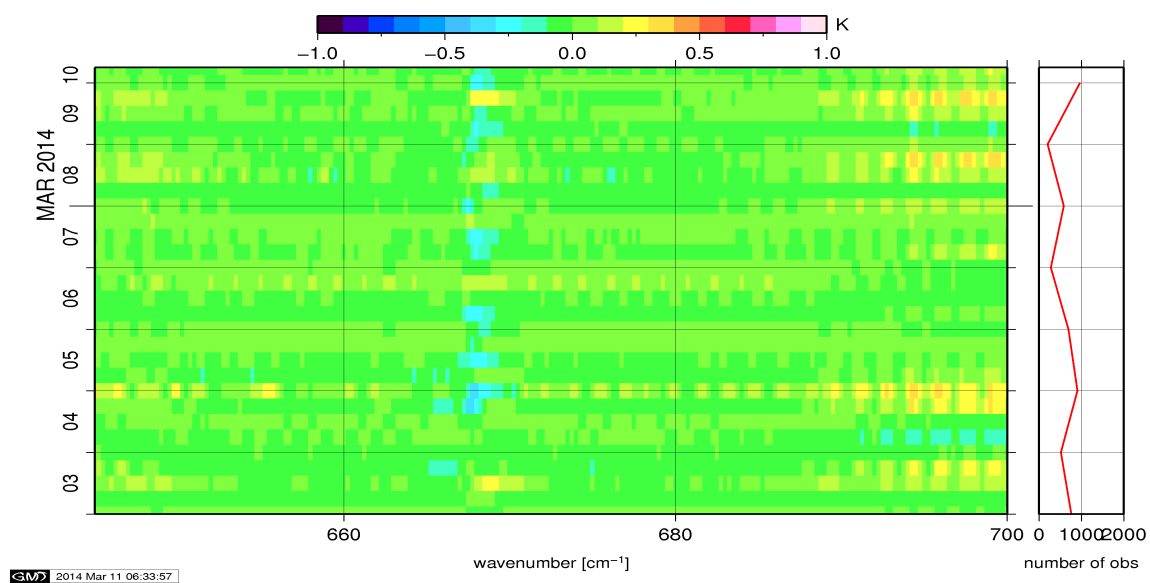
European Organisation for the Exploitation of Meteorological Satellites
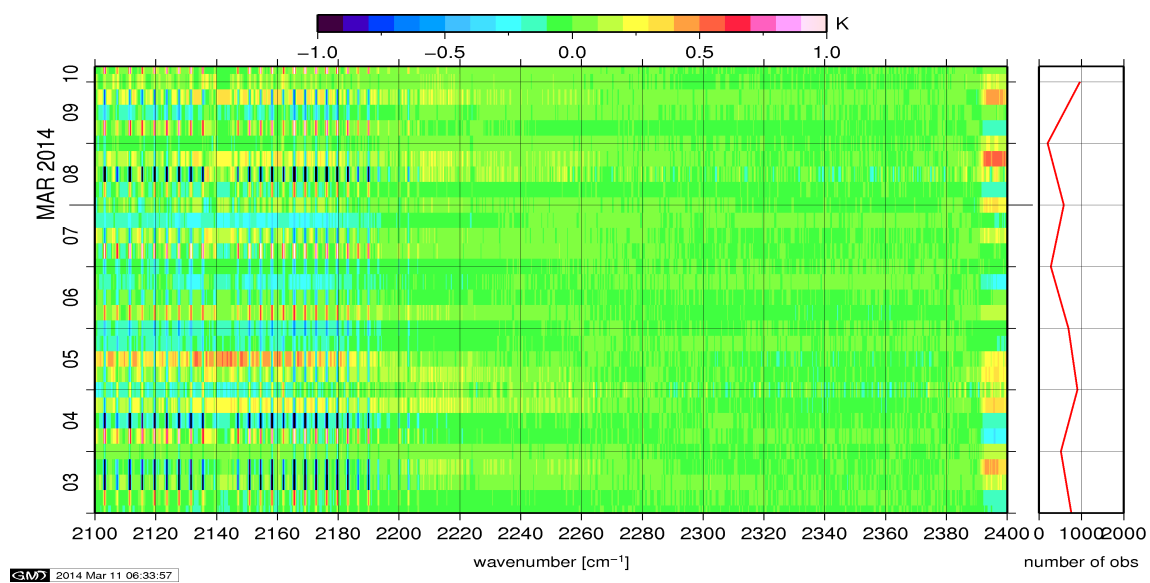
Figure 14: Radiance Anomaly in BRT: CO2 14

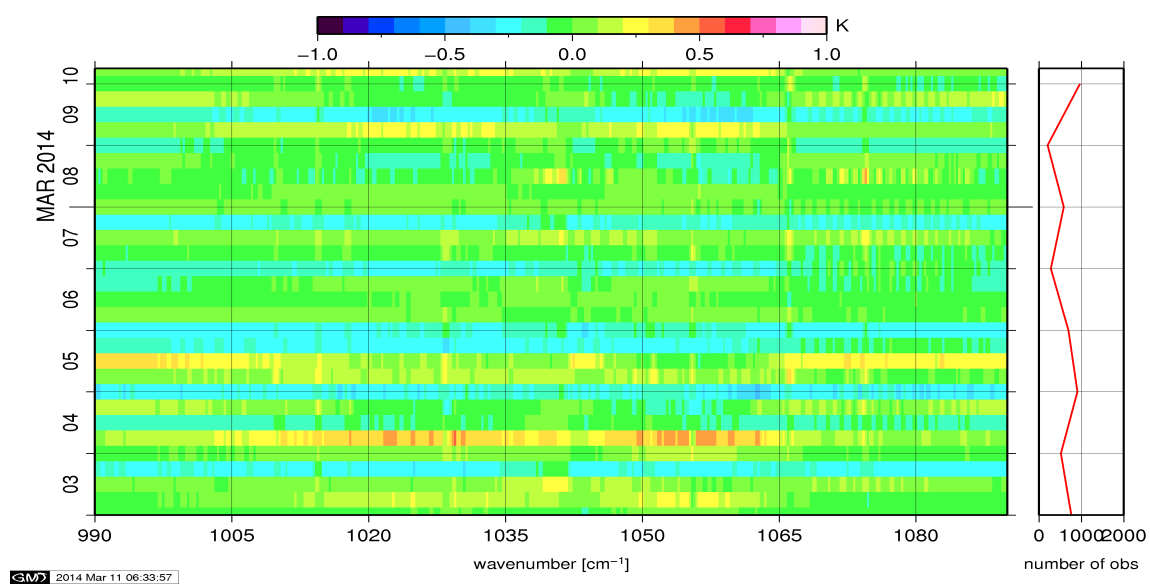Figure 15: Radiance Anomaly in BRT: CO2 4.3

Figure 16: Radiance Anomaly in BRT: O3

6   IASI-HIRS radiance comparision Channel 1-19

The radiance comparision of IASI and HIRS/4 on-board MetOp is performed on all pixel 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 temperature. 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.
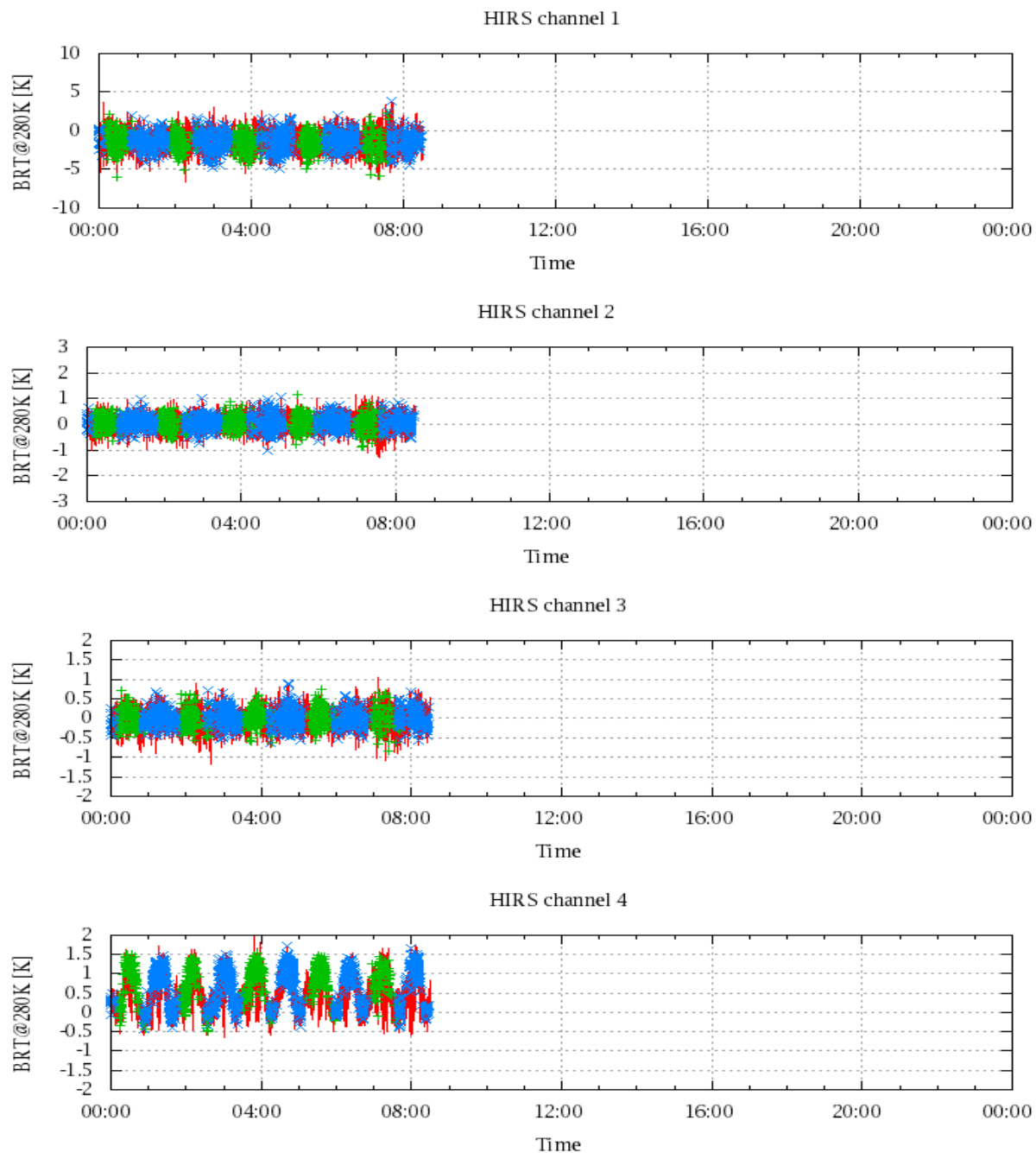

Figure 17: Radiance Differences in BRT

HIRS channel 5
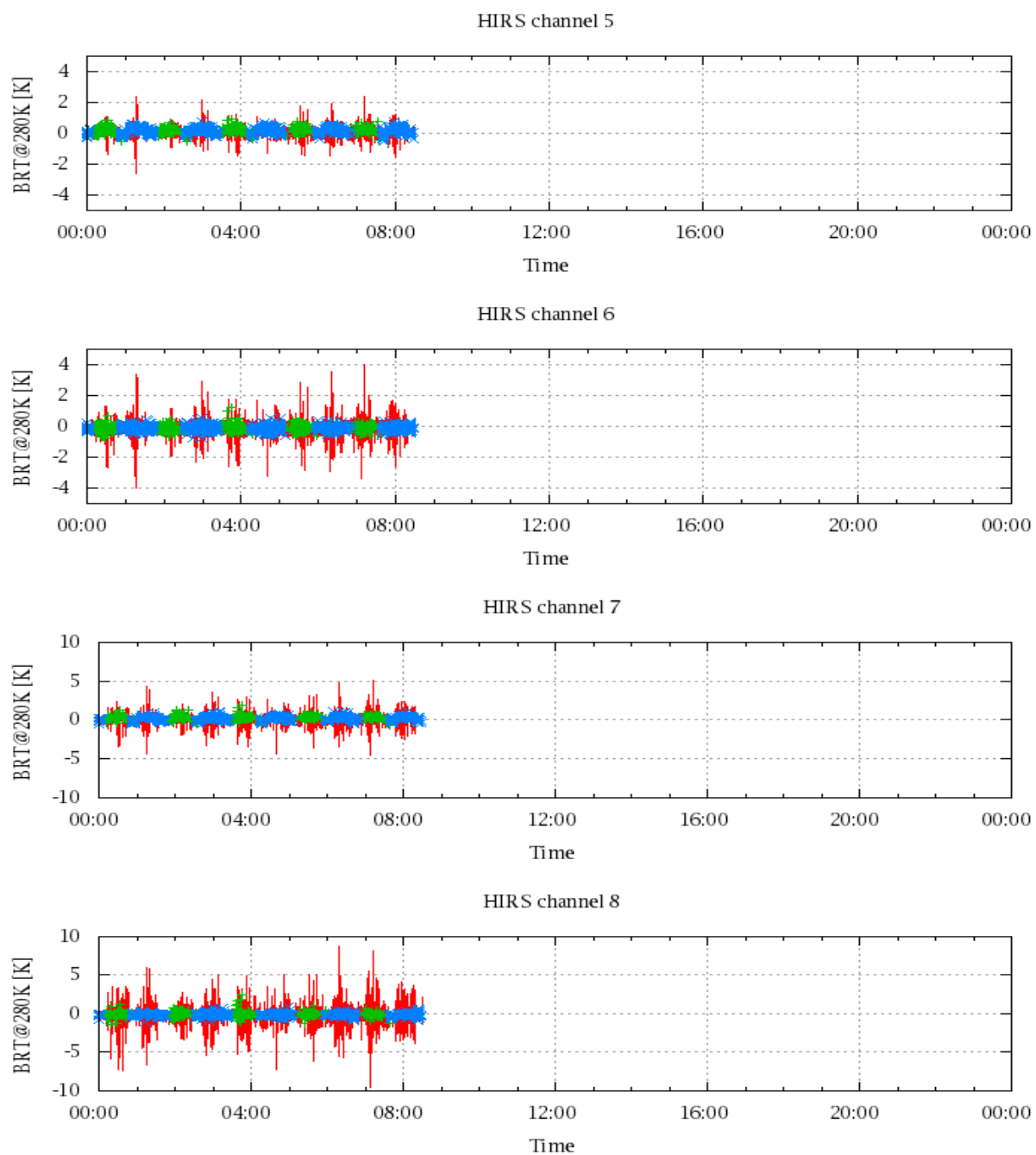
HIRS channel 6

HIRS channel 7

HIRS channel 8

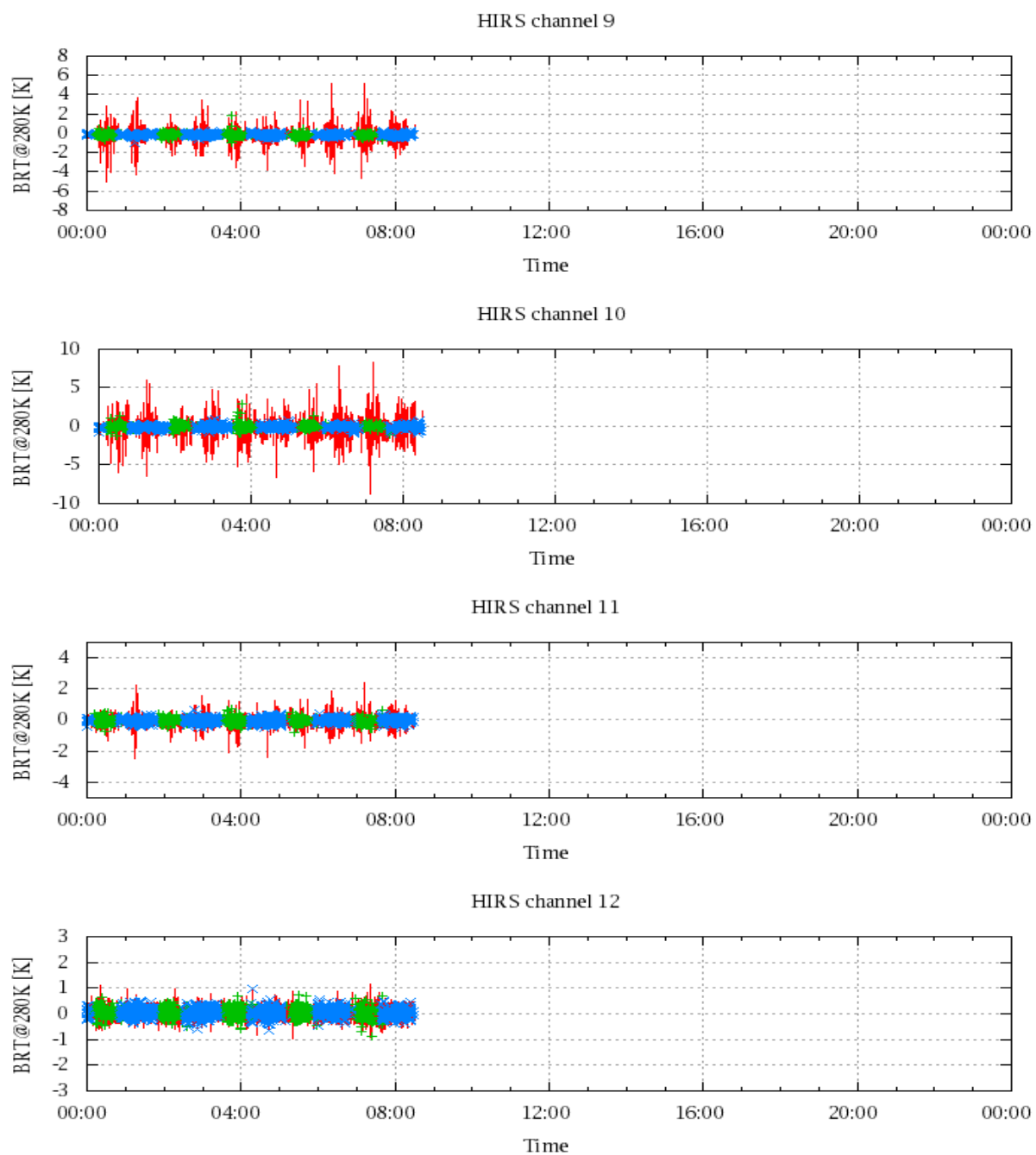Figure 18: Radiance Differences in BRT

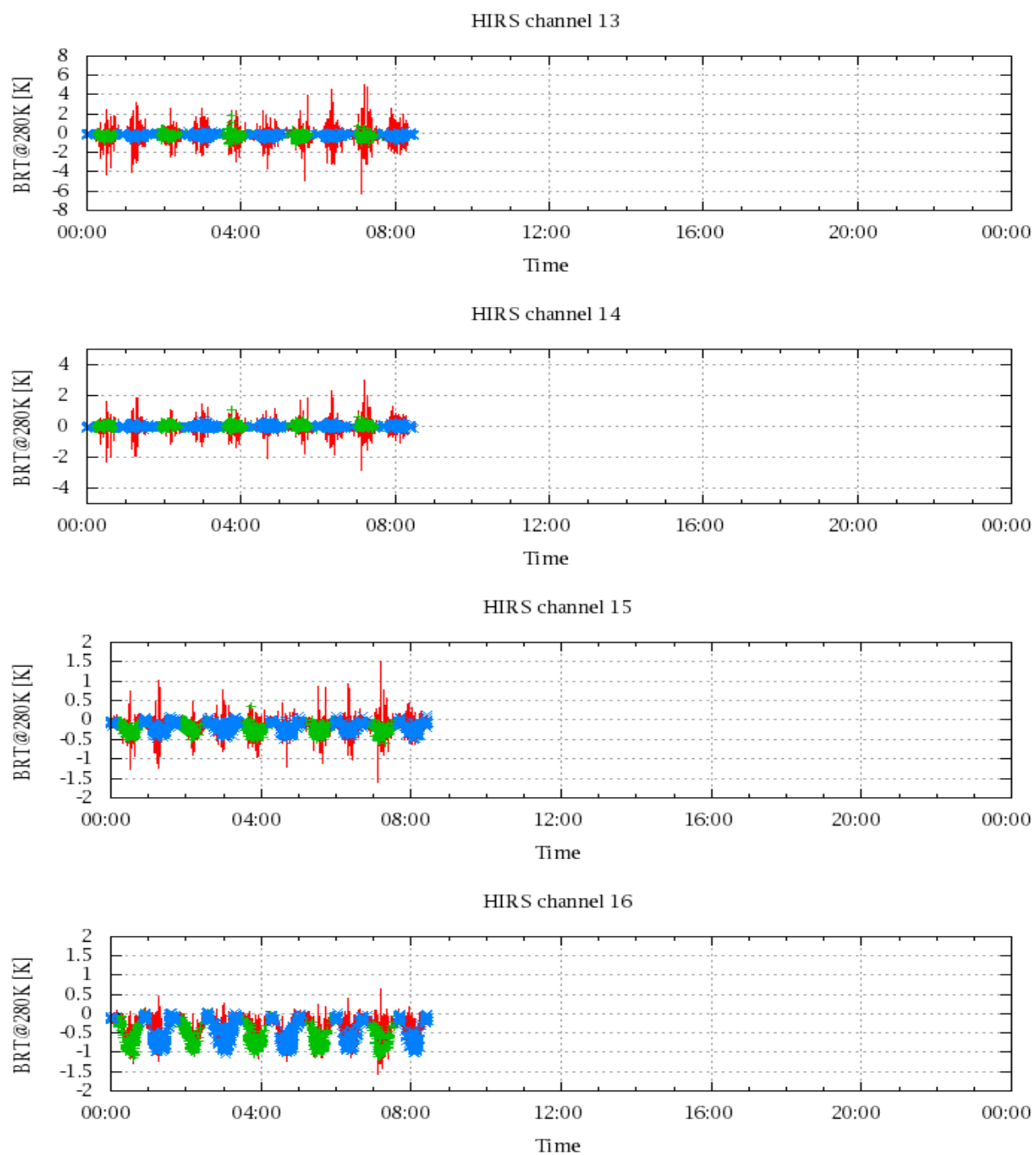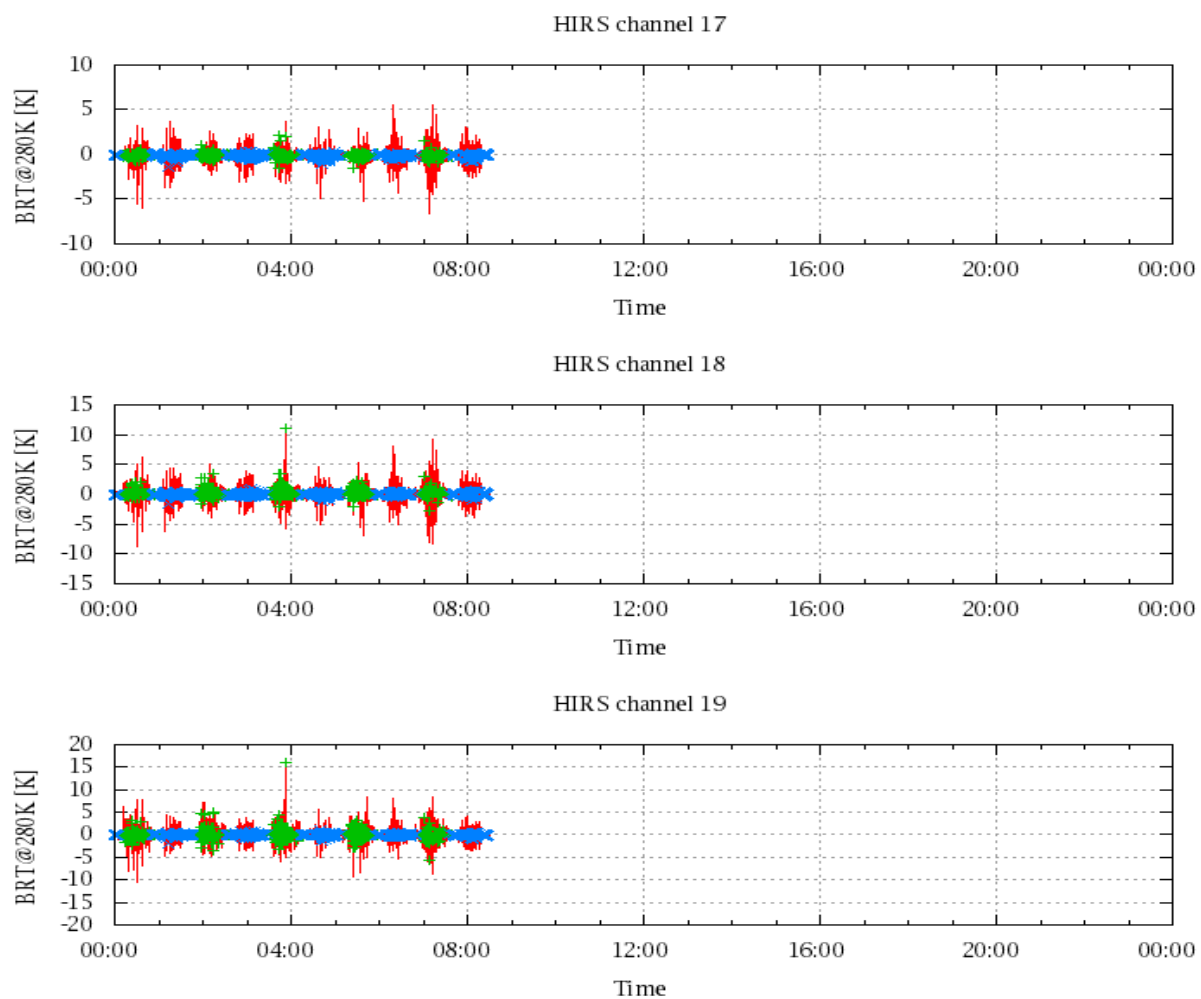Figure 19: Radiance Differences in BRT

Figure 20: Radiance Differences in BRT

Figure 21: Radinace Differences in BRT