



# Suppression Delta Warning Analysis

		Date	Signature
<b>Author:</b>	Mirna van Hoek	November 13, 2009	
<b>Checked:</b>	Jacques Claas	Nov. 16, 2009	
<b>Approved:</b>	<i>Jacques Claas</i>	"	
<b>Archive:</b>			

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## 1 Introduction

As of October 31 2009 the OC reports OMI yellow warnings in the Real Time Log (RTL). This yellow warning indicates that the parameter changed by at least the value of the suppression delta. The suppression functionality of the online system provides the ability to detect changes (as defined by the suppression delta) in the value of a mnemonic and to issue an alert only on the RTL. If suppression is enabled for the mnemonic, then a warning message is seen in the RTL when the baseline value – essentially the last reported value – exceeds  $\pm$  the suppression delta. The suppression and limit functions of the online system are independent of each other. The parameters for which warning messages appear in the RTL are:

- OMI\_TA\_SOPB\_OTH\_1 (OPB telescope temperature)
- OMI\_TA\_SOPB\_OTH\_2 (OPB-Y-foot temperature)
- OMI\_TA\_SOPB\_OTH\_3 (OPB UV temperature)
- OMI\_TA\_SOPB\_OTH\_2 (OPB VIS temperature)
- OMI\_TA\_SATMCH1 (video channel 1 temperature)
- OMI\_TA\_SATMCH2 (video channel 2 temperature)

These parameters all have a suppression delta value of 0.03.

In section 2 the APID 1834 engineering parameter files are analyzed. And in section 3 the conclusions are drawn.

## 2 Analysis of APID 1834 engineering data of DOY 310 (November 6 2009)

The FOT provided the OMI IOT with some example warning messages for DOY 310 (November 6). The warnings appear for the following times:

- 18:23:47
- 19:43:11
- 20:12:55
- 21:10:35

The most important for OMI is the stability of the OMI CCD temperatures. These are actively controlled whereas the OPB temperatures are passively controlled. First of all the ccd1 and ccd2 temperatures are checked. As can be seen in Figure 1 and Figure 2 these remain stable as always. Then the 4 OPB temperatures and both video channel temperatures are checked. In Figure 3 the OPB telescope (OMI\_TA\_SOPB\_OTH\_1) temperature is plotted, as an example, in the range 18 – 22 hours. This plot looks as expected. The times for which the warning messages appeared in the RTL are represented by the orange lines in the plot.

As can be seen in Figure 3 the parameter values around the warning value are always the same. This can also be seen in Figure 4 where the difference ( $\delta$ ) between two consecutive values of the OPB Telescope temperature is drawn. There are no  $\delta$  values larger than 0.03.

This is also true for the other OPB temperature mnemonics and the two video channel temperature mnemonics. Please note: the time difference between two consecutive telemetry values in APID 1834 data is 2 seconds.

There is no correlation between the warning messages and certain measurements as can be seen in Figure 5. The first warning message appears at the start of a tropical measurement session (icid 0), the second warning message at the end of a tropical measurement session in the next orbit. The third warning appears at the end of a (north) midlat measurement session (icid 1) and the fourth warning appears at the end of a (south) arctic measurement session (icid 2) in the next orbit.

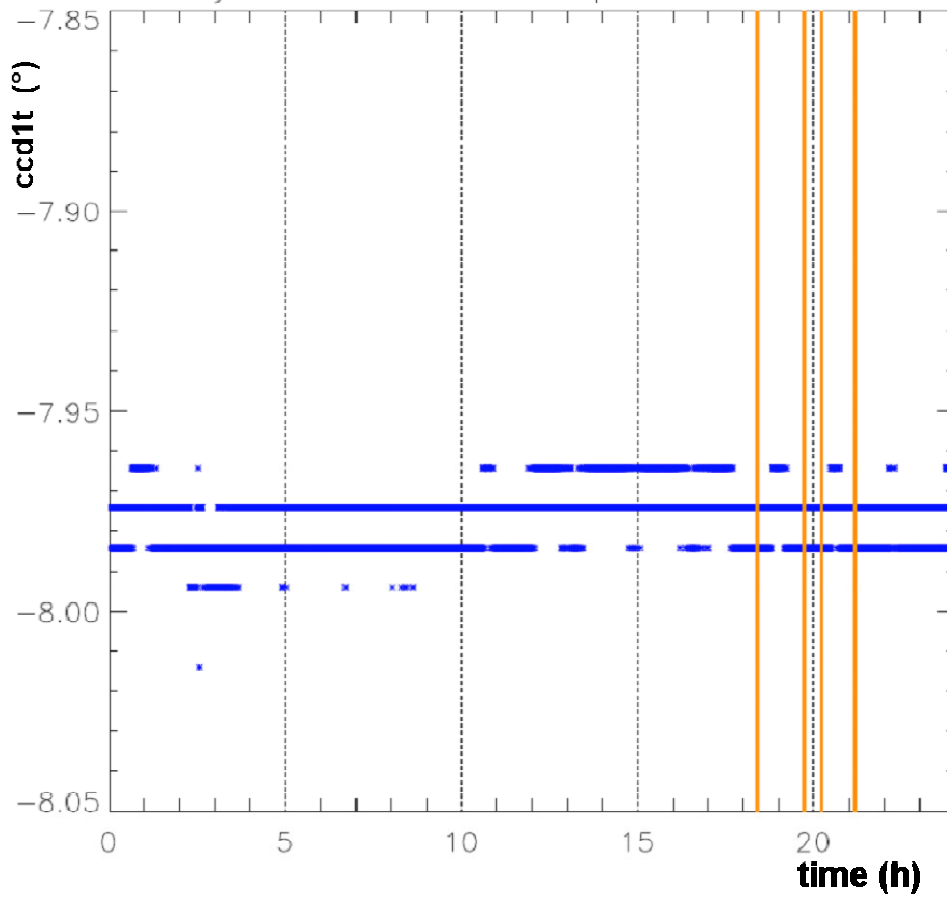


Figure 1 The ccd1 temperature versus time for DOY 310 (November 6) 2009. The variation in the parameter is as expected. The orange lines indicate the 4 times for which the warning messages for the 4 OPB temperatures and the 2 video channel temperatures appear in the RTL.

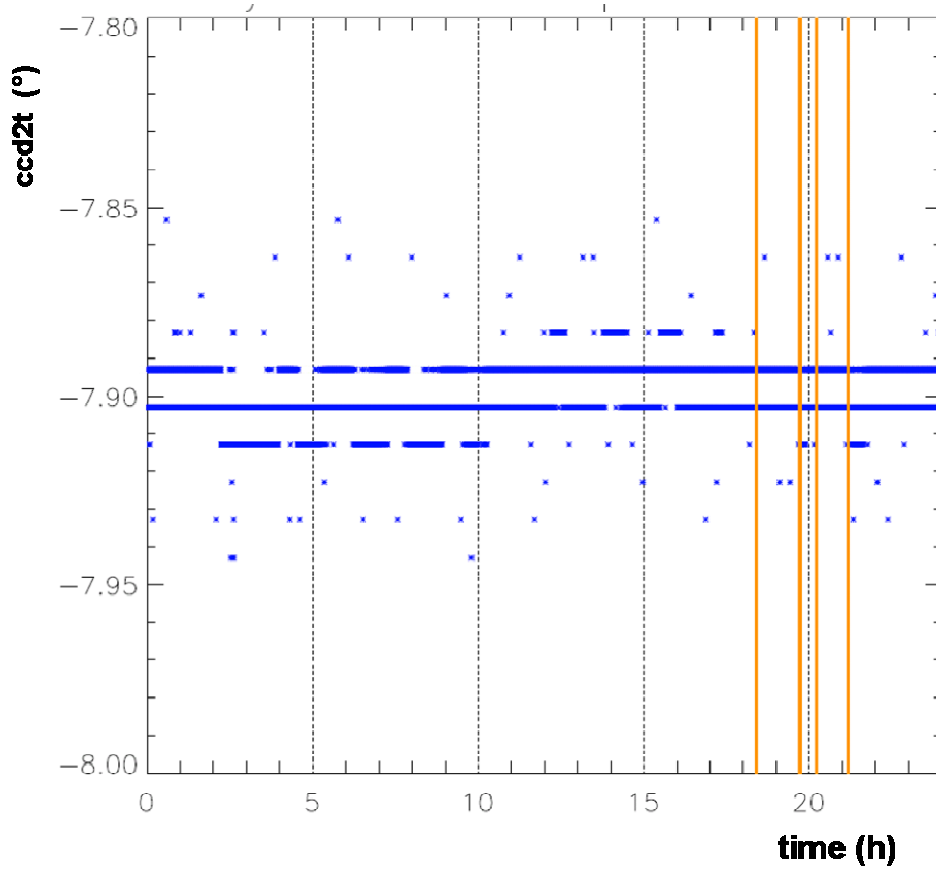


Figure 2 The ccd2 temperature versus time for DOY 310 (November 6) 2009. The variation in the parameter is as expected. The orange lines indicate the 4 times for which the warning messages for the 4 OPB temperatures and the 2 video channel temperatures appear in the RTL.

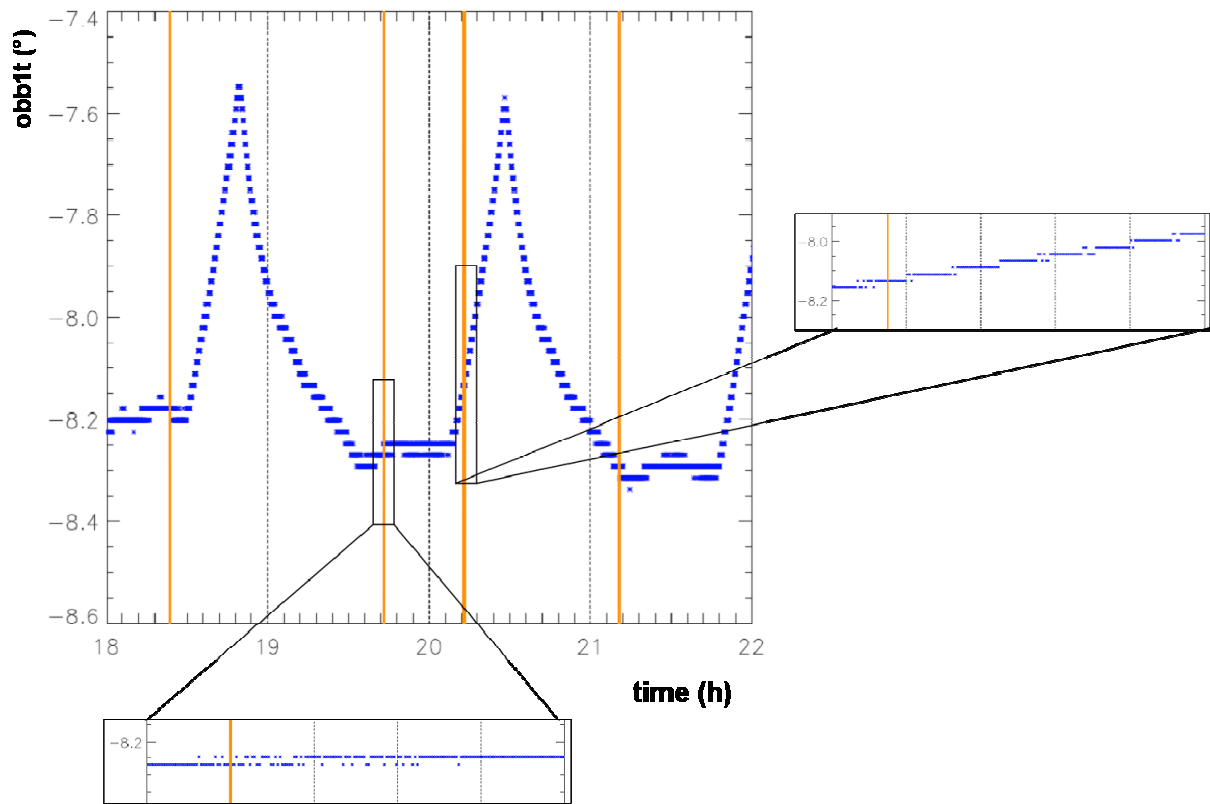


Figure 3 The OPB telescope temperature versus time for the time window 18-22 hours for DOY 310 (November 6) 2009. The variation of this parameter is as expected. The orange lines indicate the times for which there appeared a warning in the RTL. Also drawn are two zoomed-in areas around two warning times.

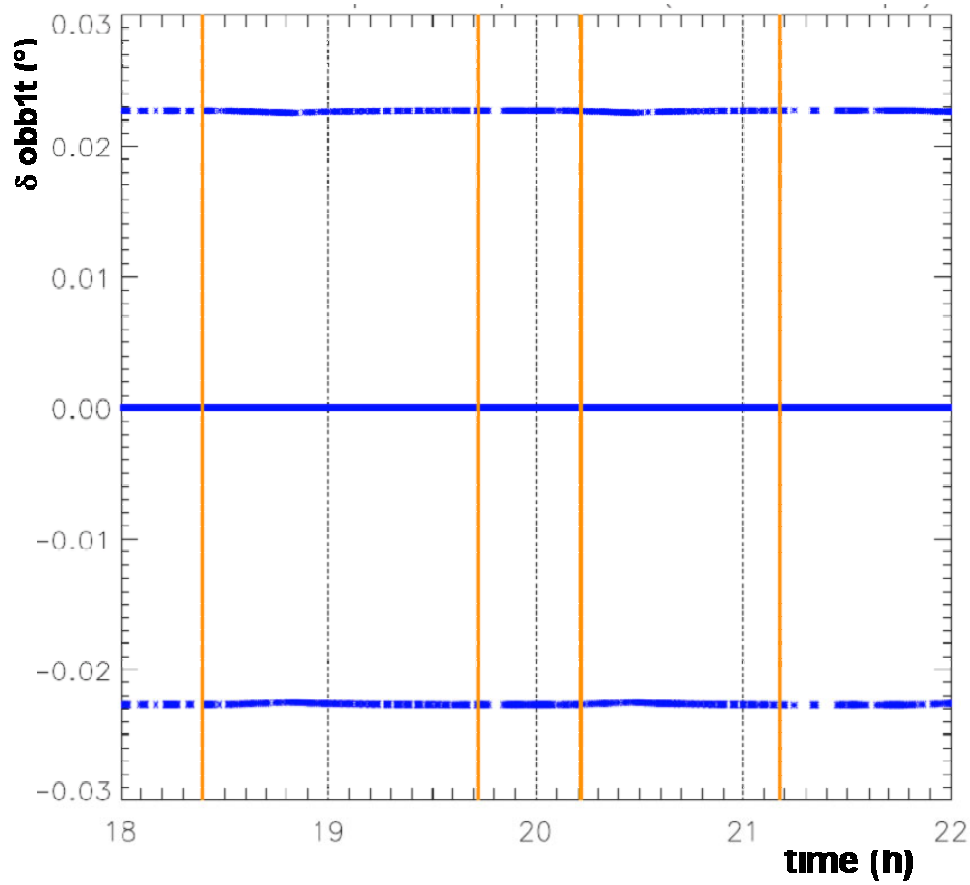


Figure 4 The difference ( $\delta$ ) between two consecutive values of the OPB telescope temperature versus time for the time window 18-22 hours for DOY 310 (November 6) 2009. The orange lines indicate the times for which there appeared a warning in the RTL.

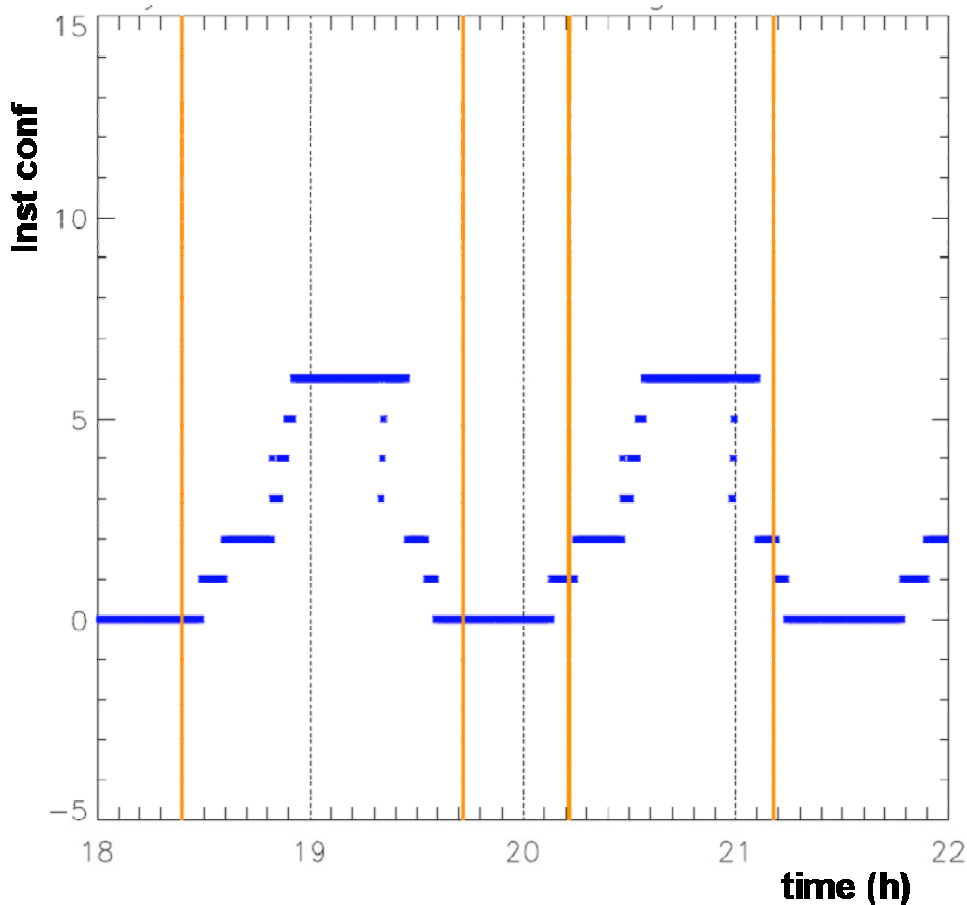


Figure 5 The instrument configuration versus time for the time window 18-22 hours for DOY 310 (November 6) 2009. The orange lines indicate the times for which there appeared a warning in the RTL.ICID 0, 1, 2, 3, 4, 5, 6 indicate tropical, midlat, arctic, dark tropical, dark midlat, dark arctic, dark ozonhole measurements respectively.

### 3 Conclusions

- As of October 31 2009 there appear yellow warning messages for certain parameters in the Real Time Log. The yellow warnings indicate that the parameter value has changed by at least the value of the suppression delta.
- The following parameters are affected and all have a suppression delta value of 0.03:
  - o OMI\_TA\_SOPB\_OTH\_1 (OPB telescope temperature)
  - o OMI\_TA\_SOPB\_OTH\_2 (OPB-Y-foot temperature)
  - o OMI\_TA\_SOPB\_OTH\_3 (OPB UV temperature)
  - o OMI\_TA\_SOPB\_OTH\_2 (OPB VIS temperature)
  - o OMI\_TA\_SATMCH1 (video channel 1 temperature)
  - o OMI\_TA\_SATMCH2 (video channel 2 temperature)
- APID 1834 engineering data of DOY 310 (November 6 2009) has been analyzed
- The ccd1 and ccd2 temperatures remain stable
- The variability of the OPB temperatures and the video channel temperatures is as expected.

- There is no instance found where two consecutive values of a parameter differ by  $\geq$  suppression delta (0.03) as can be seen in Figure 4. Note the difference in time between two consecutive telemetry values is two seconds.
- There is no correlation found between the warning messages and measurement configuration (ICID)
- We did not find anything wrong with the temperature parameters and don't know what causes the yellow alarms on the Real Time Log.