	Centre National d'Etudes Spatiales	
SCA _RAD_04 TRO-34-NT-2783-CNES	**Activity : CAL/VAL** **Thermal gain sensitivity**	**Prepared by :** **A Rosak** **Verified by :** **N Karouche**

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1. OBJECTIVE

The objective of this note is to check the thermal sensitivity of the gain, for channel 3 only.

2. METHODS

The thermal sensitivity of the gain can be computed easily if we can find two different gain measures at two different temperature level.

Unfortunately, the temperature of the instrument is very stable, and CALM sequences, dedicated to gain measurements, are too short and too rare to find two sequences with a significant temperature variation.

However, it is possible to evaluate the gain at each scan, with the reference blackbody (BBREF). This blackbody has not high performances, so it can't evaluate the absolute gain. But it is stable enough to characterize the gain variation as a function of the temperature.

3. SUCCESS CRITERIA

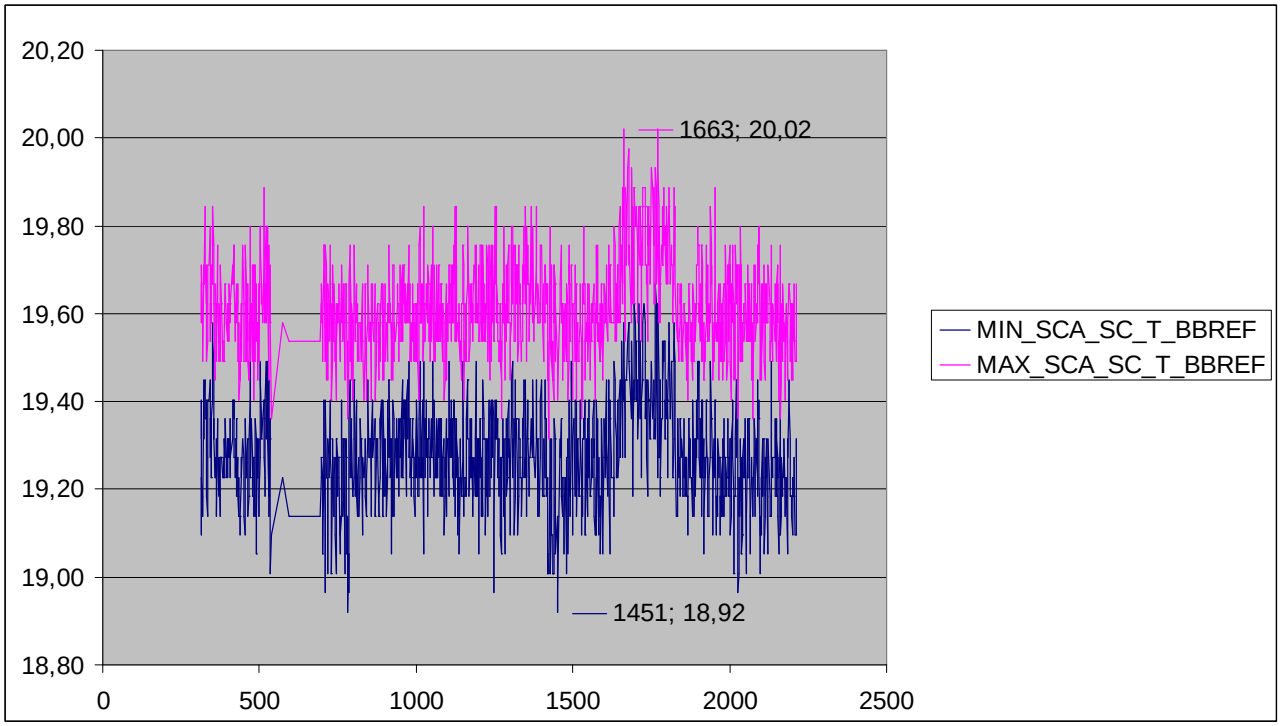
The sensitivity was measured on ground at a value of 0.08% /° for channel 2 and 3 (they are identical).

The measurement should be between 0.06 and 0.10% /°.

4. PRODUCTS USED

5. RESULTS

Here is the minimum and the maximum temperatures of the blackbody BBREF, for each orbit.



We can consider these orbits :

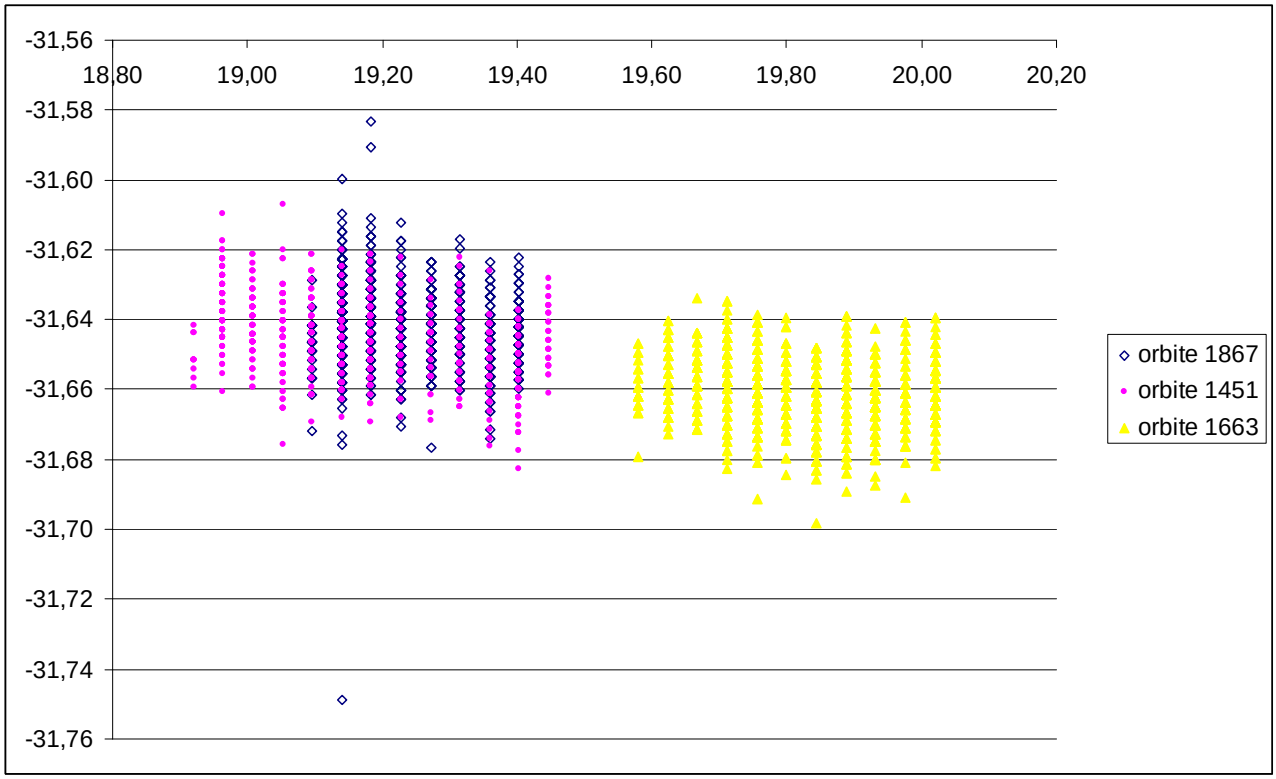
Orbit 1451 18.92°

Orbit 1663 20.02°

Orbit 1867 xxxx

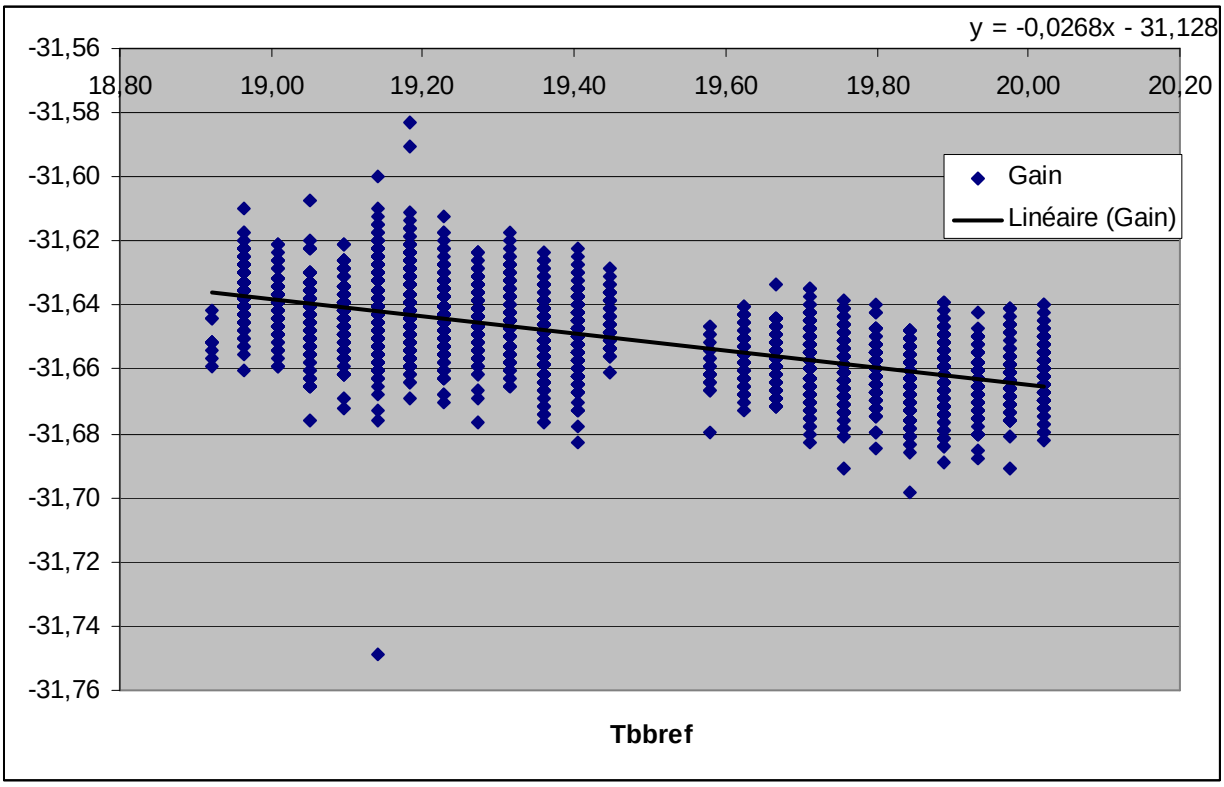
The third orbit is here to ensure that there is no drift of the gain during this period.

Here are the gain measurements on BBREF, for each scan of these orbits.



We can confirm that there is no drift between orbit 1663 and orbit 1867.

It is possible to compute the thermal gain sensitivity :



The value is -0.027/-31.191 = 0.086/100, for an expected value of 0.08/100.

This evaluation shows that there is no need to update thermal sensitivity of gains.

The value measured in vacuum chamber on ground, with a greater temperature difference, can be applied.