Global-scale Observations of the Limb and Disk (GOLD)

Release Notes

[Revision 1.1 - May 14, 2019]

Changes

Revision	Date	Changes
1.0	2/28/2019	Initial release
1.1	5/14/2019	Added “Incorrect Radiance values for the Night observations” to Known Issues (section 2.1.1)

Table of Contents

1 Data Products:

The GOLD data Release 1 contains Channel A Level 1C (L1C) and Level 1D (L1D) data products only. The table below provides the list of Version and Revision numbers associated with each data product for this release.

We refer users of these data products to the "***GOLD Public Data Product Guide***", available at http://gold.cs.ucf.edu/documentation/ for details about how these were obtained, about their file format and content.

The next data release will include Level 1C and 1D, as well as Level 2 data products.

Data Product	Release Version Number	Release Revision Number
L1C: DAY	01	01
L1C: LIM	01	01
L1C: OCC	01	01
L1C: NI1	01	01
L1D: DAY	01	01
L1D: LIM	01	01
L1D: OCC	01	01
L1D: NI1	01	01
L2: NMAX	N/A	N/A
L2: O2DEN	N/A	N/A
L2: ON2	N/A	N/A
L2: QEUV	N/A	N/A
L2: TDISK	N/A	N/A
L2: TLIMB	N/A	N/A
L3: TLIMB AVG	N/A	N/A
L3: QEUV AVG	N/A	N/A

Table 1-1 Version/Revision Numbers by Data Product for this Release

2 Known issues:

There are a number of known issues with the data provided in Release 1. These are described in the following sections.

2.1 Level 1

2.1.1 Incorrect Radiance values for the Night observations

An error in the calculation of the nightside disk radiances was discovered in the code generating the L1C NI1 files. The count rates and the counts per second are not affected. Only the radiances reported for nightside disk imaging are affected. All of the L1C nightside disk data generated in version 1 report incorrect radiance values. These will be corrected in the next data release.

2.1.2 Gradient in sensitivity from top to bottom of detector is not included in the calibration

In this release, we are not correcting for a change in the instrument responsivity along the slit. This is a ~10% effect from top to bottom of the slit. The top panel of Figure 2-1 shows that Near the equator, values extracted from the southern hemisphere scan (red) are ~10% larger than those from the northern hemisphere scan (black). The magnitude of the difference decreases with increasing wavelength as illustrated for LBH radiances shown in the lower panel. We plan on adding this correction in future data releases.

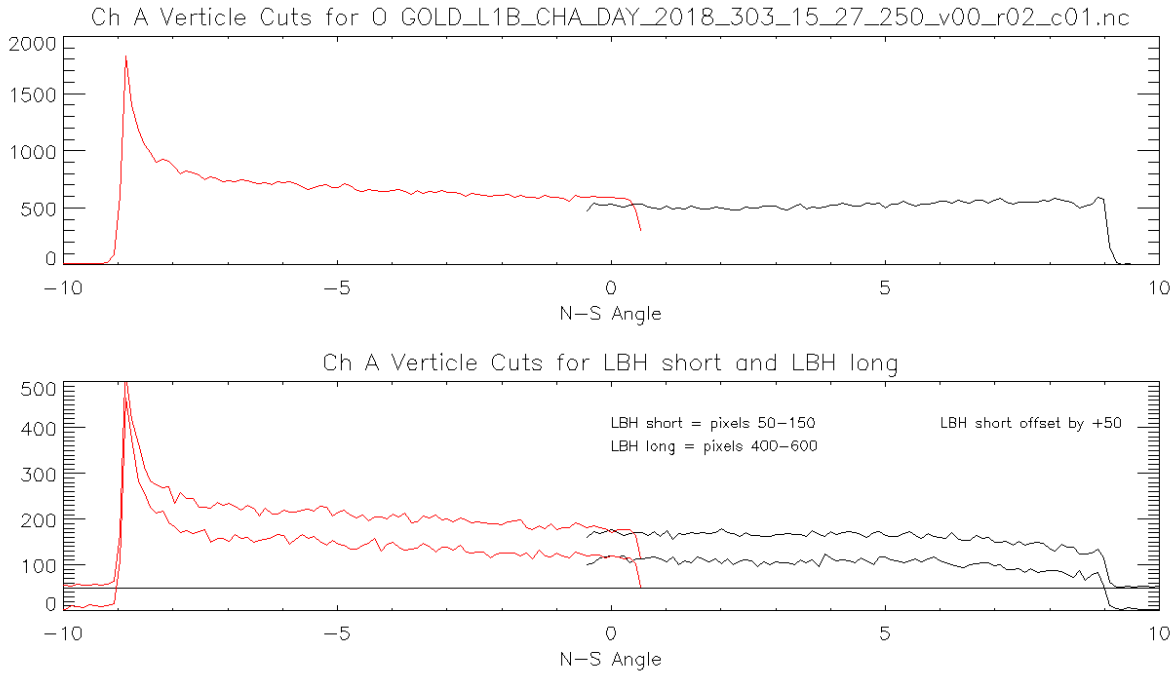

Figure 2-1 Uncorrected Vertical Sensitivity Variation

2.1.3 Time Delay of Reconstructed Full Disk Images

The projected height of the slit covers more than half the Earth, with an overlap around the equator when scanning the northern and the southern hemispheres. Full disk images made by combining northern hemisphere radiance images with those from the adjacent (in time) southern hemisphere image, will show ‘banding’ where the images overlap at the equator. This occurs because incidence and emission angles change throughout the 30 minutes during which the images are obtained. The effect is more pronounced early and late in the day. Figure 2-2 shows this effect on a DAY scan.

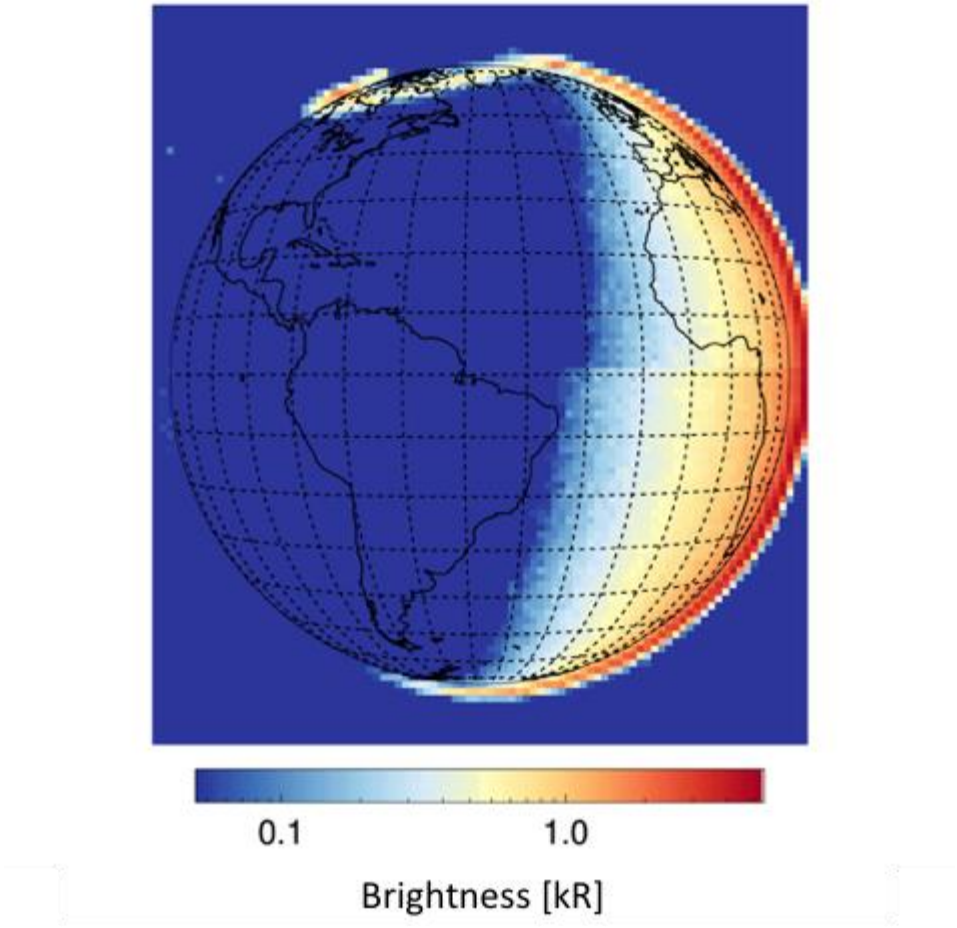

Figure 2-2 Combined scans of north and south latitudes from L1C data

2.1.4 Incomplete Scattered Light Correction

Due to the signal to noise, the first version of the background and scattered light removal algorithm assumes that there is no wavelength dependence. Though small, this is not exact and will be accounted for in later releases. The figure below shows that there does appear to be a small slope when looking at the regions of the spectrum where we believe there should be no radiance.

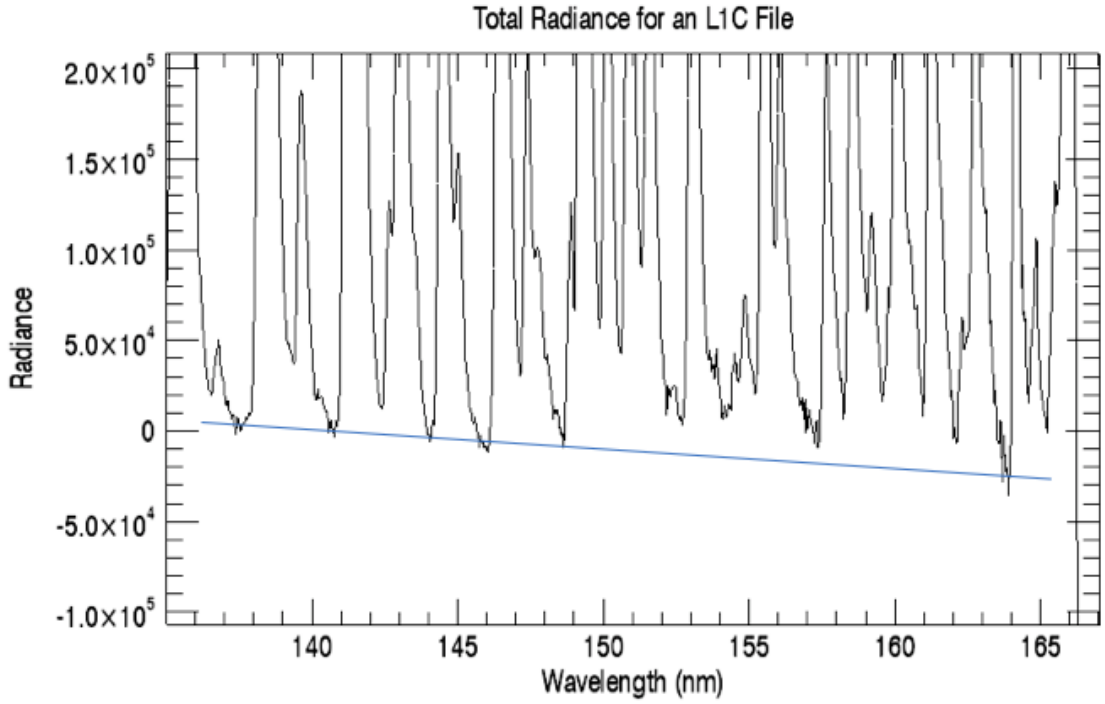

Figure 2-3 Wavelength Dependence Scattered Light

2.1.5 No Flatfield Correction

No flatfield correction is currently being applied in this release. See section 3.1.6.2 in the Public Science Data Products Guide

2.1.6 No Channel B data

Channel B data is not being released due to uncertainty in the detector sensitivity. These data will be released after the detector sensitivity characterization is complete.

2.1.7 Slit Movement due to Thermal Changes

The projected image of the slit on the detector moves slightly with changing temperature. We are currently using the “nominal” slit position on the detector to assign a latitude to every corresponding Y-pixel along the slit and are not correcting for any movement of the image of the slit. This effectively adds additional uncertainties in the assigned latitude. Figure 2-4 shows that for a 26°C change, we see a maximum shift of about 3 L1B pixels which corresponds to ±20 km at nadir. This instrument effect will be corrected in a future release.

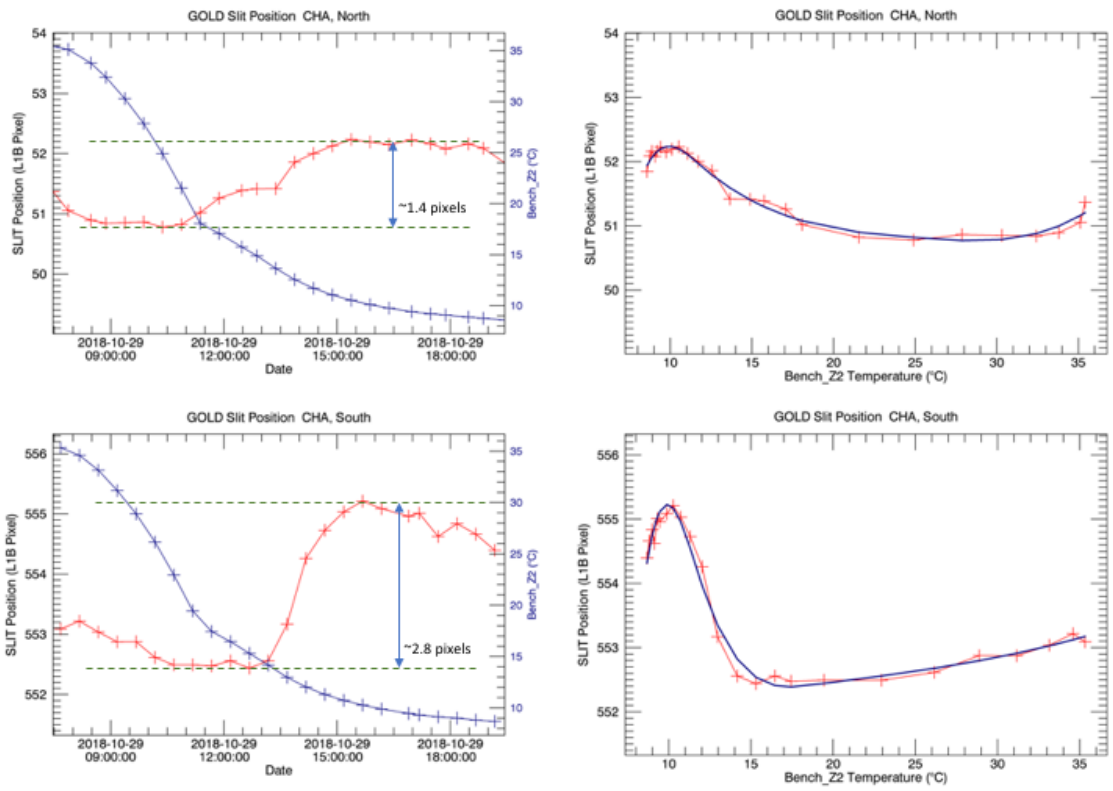

Figure 2-4 Vertical Slit Motion With Temperature

2.1.8 Occasional Incorrect Stellar Occultation Background Subtraction

Occasionally an additional star appears in the occultation window and corrupts the background subtraction. This is shown in the below image for 152nm. In future releases, these stars will be flagged.

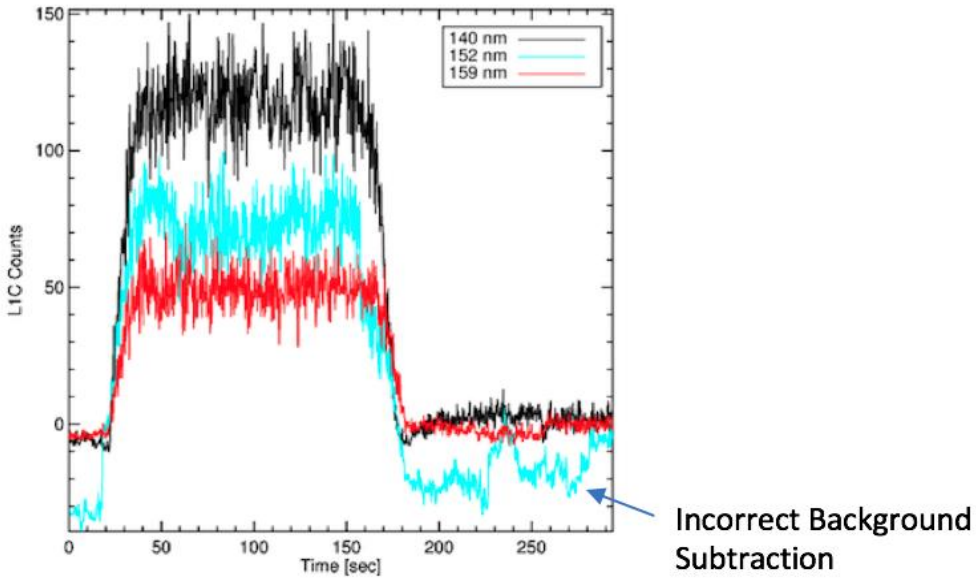

Figure 2-5 Incorrect Occultation Background Subtraction

2.1.9 Stellar Occultation Wavelength Feature

The wavelength returned is purely a function of the star and so the solution is not applicable when the star is outside the view of the occultation slit. For the time steps outside of the occultation slit, the default high resolution slit wavelength solution is used. This can add an unrealistic discontinuity in the wavelength data. This is intentional until a better approach is agreed on.

2.1.10 Incorrect Background Subtraction at Limb in Day Scans

The sharp transition in the background between On and Off Limb is not accurately captured, so the background is over corrected. This will be addressed in future releases.

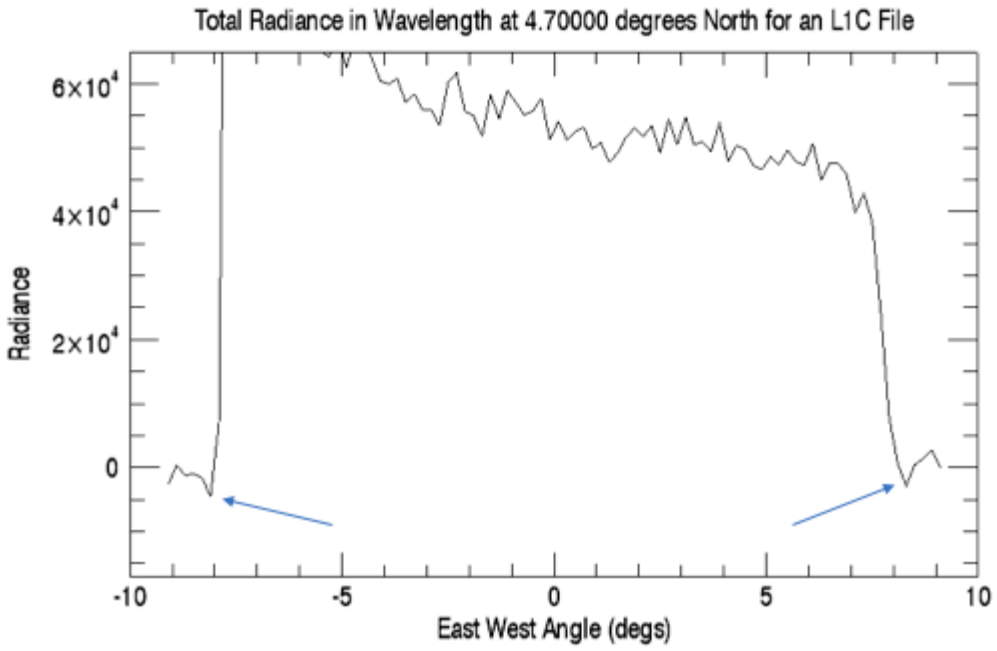

Figure 2-6 Over Corrected Background Subtraction at Limb

2.1.11 No local dead-time Correction for Occultations

Local dead-time correction, which affects the Occultations, has not been applied. The magnitude of the effect varies with the brightness of the star. A sample correction is shown in Figure 2-7.

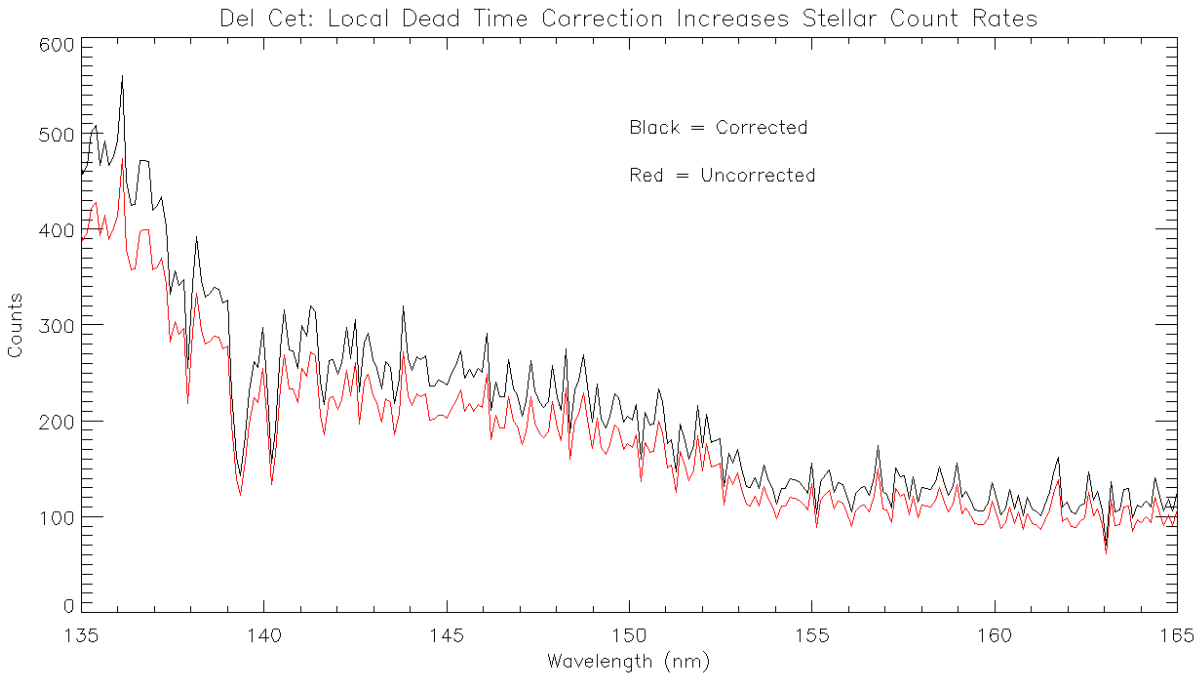

Figure 2-7 Counts Comparison with Dead-Time Correction

2.1.12 No Moon Flag

The presence of the Moon in the field of view is currently not being flagged during processing. This could affect the Limb and Occultation measurements. This issue will be addressed in future releases.

2.2 Level 2

N/A for this release

3 Upcoming Work / Plan for Upcoming Releases

3.1 Level 1

Fix Radiance values for night observations

Updated sensitivity

Updated scattered light correction

Flatfield correction

Updated geolocation correction (slit image movement)

Updated occultation background correction

Channel B data release

Quality flags for stars and moon in field of view

3.2 Level 2

N/A for this release

3.3 Level 3

N/A for this release