GERB3 commissioning calibration comparison

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Initial inter-comparison between GERB-1 and GERB-3 fluxes during November and December joint operation was carried out.

The SW radiance from each instrument during this period has also been compared to CERES Ed3 products.

After restart differences in the calibration between the two sides of the GERB 3 mirror apparent that require re-assessment and calibration adjustment and processing updates to address.
November 2012 GERB 3/GERB 1 LW flux comparison

Ratio of average fluxes for November 2\textsuperscript{nd} – 21\textsuperscript{st} 00:00-02:00 UTC

<G3>/<G1> LW flux

Ratio of average fluxes for November 2\textsuperscript{nd} – 21\textsuperscript{st} 11:00-13:00 UTC

<G3>/<G1> LW flux
GERB 3 GERB 1 LW flux regression day and night November 2012

\[ G3 = 1.013G1 - 3.04 \]
\[ \langle G3 \rangle / \langle G1 \rangle = 1.002 \]

\[ G3 = 1.006G1 - 1.11 \]
\[ \langle G3 \rangle / \langle G1 \rangle = 0.99 \]
November 2012 11:00 – 13:00 UTC GERB 3/GERB 1 flux comparison

Ratio of average fluxes for November 2\textsuperscript{nd} – 21\textsuperscript{st} 11:00-13:00 UTC

\[
\frac{G3}{G1} = 1.12 \cdot G1 + 0.13
\]
Initial comparison between the GERB 3 and GERB 1 fluxes for November 2012, showed very similar LW values, but GERB 3 12% higher in SW.

However GERB 1 has experienced spectral ageing over its operational life lifetime

Adjusting for GERB 1 spectral aging effect reduces the offset to 5-7%
GERB 3 comparisons November 2012

GERB 3/CERES radiance ration for Nov 2012 is around 4% except for the bluest scenes (which have fewer matched points).

SEV 3 GERB-like RSW for this period around 3-4% higher than SEV 2 GERB-like RSW
A similar comparison with GERB 2 during 2012 hasn’t been carried out (because of the problem processing these data with the correction calibration for each mirror fact).

But comparing the GERB-2/CERES ratio in June 2004 with the GERB-3/CERES ratio in November 20012 we see it is more similar than the GERB-1/CERES ratio.
Ground gain offset effects

Difference between the GERB 3 recal delivered standard gains and the 2002 values seem to be very similar to the difference between standard and fit values. Seeming to implicate a problem with the offset removal being the cause of both differences.

There will be knock on effects on the applicability of the Lf(IBB) table.
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Summary

- GERB 3 LW 2012 compared well to GERB 1 LW (geolocation TOT/SW matching errors producing some more noise in day)
- GERB 3 SW 2012 12% higher than GERB 1
- After correction of GERB 1 SW to SOL value assuming FM1 stable reference difference reduces to 5-7%
- Removing offset issue with SW gain measurement in recal will reduce by 1.5-2% (varies with pixel) GERB 3 SW calibration
- GERB 3 SW closer to GERB 2 (SOL) calibration than GERB 1
- Next step to assess mirror side difference since stoppage.
Ground gain offset effects

GERB 3 2008 calibration difference between gain calculated via standard procedure (offset removed by VISCSoff in SW and BB in TOTAL), and by fitting a slope to the VISCS high/low data or WBB(t -20 to +70°C)