ACS Science SMOV Update

David Golimowski (30 May 2009)

SBC Turn On

- Phase 2 completed
- Dark frame inspected and verified. Mean counts of $2.7-6.4 \times 10^{-6}$ cts/pix/s consistent with usual rates of $\sim 10^{-5}$ cts/pix/s

ACS-R Optimization Campaign

- Iteration 1 of Optimization Campaign successfully executed, dumped, and processed through OPUS.
- All ASIC configuring and commanding verified via checks of OPUS header keywords.
- STScI continuing analysis of image data; should wrap up today.
- GSFC/Teledyne inspection of O-mode frames revealed minor bug in ASIC FAC. Under some circumstances, the ADC sample clock and CCD clocks do not remain in perfect phase, due to different path lengths (# of microcontroller cycles) through FAC. Problem is benign; no impact on science observations. Code fixed and verified; could go into next FAC drop.
Representative Images - 1

4-amp bias; dual-slope int

100 sec dark; dual-slope int
Representative Images - 2

11869/A1/JACNA1D3Q (prescan subtracted)

A, MEDIAN PRESCAN = 2093 DN
B, MEDIAN PRESCAN = 2215 DN
C, MEDIAN PRESCAN = 2301 DN
D, MEDIAN PRESCAN = 2308 DN

11869/A1/JACNA1CJQ (prescan subtracted)

A, MEDIAN PRESCAN = 2083 DN

EPER flat; DSI; F435W+F555W

4-amp flat; DSI; F435W
## ACS-R Performance Summary

<table>
<thead>
<tr>
<th>Metric</th>
<th>Jan 2007 (actual)</th>
<th>May 2009 (predicted)</th>
<th>Problematic</th>
<th>May 2009 (OC Iter 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read noise (e-)</td>
<td>5.5</td>
<td>DSI: 4.0</td>
<td>10</td>
<td>DSI: 3.4-4.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C&amp;S: 4.1-5.1</td>
<td></td>
<td>C&amp;S: 4.1-5.1</td>
</tr>
<tr>
<td>Dark current (e-/pix/hr)</td>
<td>10.7</td>
<td>15</td>
<td>100</td>
<td>20-25</td>
</tr>
<tr>
<td>Hot pixels (%)</td>
<td>0.68</td>
<td>1.1</td>
<td>1.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Full well depth (e-)</td>
<td>84,000</td>
<td>84,000</td>
<td>40,000</td>
<td>~80,000</td>
</tr>
<tr>
<td>Non-linearity (%)</td>
<td>&lt; 0.1</td>
<td>&lt; 0.1</td>
<td>0.5</td>
<td>TBD</td>
</tr>
<tr>
<td>CTE</td>
<td>0.999949</td>
<td>0.999921</td>
<td>0.9999</td>
<td>TBD</td>
</tr>
<tr>
<td>Cross-talk</td>
<td>4x10^-5</td>
<td>4x10^-5</td>
<td>4x10^-4</td>
<td>1x10^-4</td>
</tr>
<tr>
<td>Gain instability (%)</td>
<td>&lt; 0.1</td>
<td>&lt; 0.1</td>
<td>&lt; 0.2</td>
<td>TBD</td>
</tr>
</tbody>
</table>
Sample Photon Transfer Plot

Amp D; dual-slope integration

Gain (e/DN) = 2.021 ± 0.037
Gain (e/DN) = 2.023 ± 0.006