16519 - Monitor the parameters of the Pixel-CTE

Cycle: 29, Proposal Category: CAL/ACS
(Availability Mode: RESTRICTED)

ABSTRACT
The purpose of this program is to monitor charge traps in the ACS/WFC CCDs at the lowest charge level and update the pixel-based CTE model parameters as needed. As shown in ACS ISR 2018-04, the number of traps affecting small to medium-size charge packets can be inferred from the shape of warm pixel trails in short darks with a range of background (post-flash) levels. A new, more direct approach to pinning the CTE model has been developed to compare these data to scaled long (1000s) darks from the Daily Monitor program. By examining the survival of WPs as a function of row number and post-flash level, we can develop a direct model for CTE losses.

OBSERVING DESCRIPTION
We will take a series of short darks with darktimes of about 14s and post-flash levels of: 0, 1.4, 2.8, 4.2, 7.0, 12, 20, 30, 50, 70, and 100 electrons. In order to keep the darktime relatively constant for all of the darks, we have modified the exposure time of each dark to account for the variation in flash duration. The post-flash level is not constant across the detector, but varies by +/- 50%, so we will carefully measure the background level in our analysis. This program is a continuation of Cycle 28 program 16391.

ACS ISR 2018-04 (Anderson & Ryon 2018) outlines the established method for pinning the CTE model. Updated CTE model parameters obtained from this program will be used in the ACS/WFC calibration pipeline and to monitor the evolution of CTE over time.

These visits should be taken in May-June 2022, one year after program 16391. These visits should also be taken during the same anneal period and within 5 days in order to avoid the appearance of many new unstable warm and hot pixels.
Proposal 16519 - 0e-70e-12e (01) - Monitor the parameters of the Pixel-CTE

Visit
Proposal 16519, 0e-70e-12e (01)
Diagnostic Status: No Diagnostics
Scientific Instruments: ACS/WFC
Special Requirements: BETWEEN 15-MAY-2022:00:00:00 AND 15-JUN-2022:00:00:00; SEQ 01,02,03,04 WITHIN 5 D
Comments: These visits should be taken during the same anneal period and within 5 days in order to avoid the appearance of many new warm and hot pixels.

Exposures

<table>
<thead>
<tr>
<th>#</th>
<th>Label</th>
<th>Target</th>
<th>Config, Mode, Aperture</th>
<th>Spectral Els</th>
<th>Opt. Params</th>
<th>Special Reqs</th>
<th>Exp. Time (Total)/[Actual Dur.]</th>
<th>Orbit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>no flash short dark</td>
<td>DARK</td>
<td>ACS/WFC, ACCUM, WFC</td>
<td>DEF</td>
<td></td>
<td></td>
<td>10.3 Secs (10.3 Secs)</td>
<td>[I]</td>
</tr>
<tr>
<td>2</td>
<td>70e flash short dark</td>
<td>DARK</td>
<td>ACS/WFC, ACCUM, WFC</td>
<td>DEF</td>
<td>FLASH=70</td>
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<td>3.5 Secs (3.5 Secs)</td>
<td>[I]</td>
</tr>
<tr>
<td>3</td>
<td>12e flash short dark</td>
<td>DARK</td>
<td>ACS/WFC, ACCUM, WFC</td>
<td>DEF</td>
<td>FLASH=12</td>
<td></td>
<td>7.6 Secs (7.6 Secs)</td>
<td>[I]</td>
</tr>
</tbody>
</table>

Orbit Structure

**Orbit 1**
Unused Orbital Visibility = 3142

- Exp. 1
- Exp. 2
- Exp. 3

Occultation

Server Version: 20200619
Proposal 16519 - 1.4e-50e-7e (02) - Monitor the parameters of the Pixel-CTE

Visit

Scientific Instruments: ACS/WFC
Special Requirements: (none)

Comments: These visits should be taken during the same anneal period and within 5 days in order to avoid the appearance of many new warm and hot pixels.

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<td>FLASHEXP=0.1; FLASHCUR=LOW</td>
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<td>7.3 Secs (7.3 Secs)</td>
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<td>2</td>
<td>50e flash short dark</td>
<td>DARK ACS/WFC, ACCUM, WFC DEF</td>
<td>FLASH=50</td>
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<td>7e flash short dark</td>
<td>DARK ACS/WFC, ACCUM, WFC DEF</td>
<td>FLASH=7</td>
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<td>[1]</td>
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</table>

Orbit Structure

[Diagram showing orbit structure with Exp. 1, Exp. 2, Exp. 3, and Occultation marked]
Proposal 16519 - 2.8e-30e-20e (03) - Monitor the parameters of the Pixel-CTE

Visit
Proposal 16519, 2.8e-30e-20e (03)
Diagnostic Status: No Diagnostics
Scientific Instruments: ACS/WFC
Special Requirements: (none)
Comments: These visits should be taken during the same anneal period and within 5 days in order to avoid the appearance of many new warm and hot pixels.

Exposures
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<td>ACS/WFC, ACCUM, WFC</td>
<td>DEF</td>
<td>FLASHEXP=0.2; FLASHCUR=LOW</td>
<td></td>
<td></td>
<td>7.5 Secs (7.5 Secs)</td>
<td>[I]</td>
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<tr>
<td>2</td>
<td>30e flash short dark</td>
<td>DARK</td>
<td>ACS/WFC, ACCUM, WFC</td>
<td>DEF</td>
<td>FLASH=30</td>
<td></td>
<td></td>
<td>5.5 Secs (5.5 Secs)</td>
<td>[I]</td>
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<tr>
<td>3</td>
<td>20e flash short dark</td>
<td>DARK</td>
<td>ACS/WFC, ACCUM, WFC</td>
<td>DEF</td>
<td>FLASH=20</td>
<td></td>
<td></td>
<td>6.4 Secs (6.4 Secs)</td>
<td>[I]</td>
</tr>
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</table>

Orbit Structure

Server Version: 20200619

Unused Orbital Visibility = 3142
Exp. 1
Exp. 2
Exp. 3
Occultation

0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 sec
Comments: These visits should be taken during the same anneal period and within 5 days in order to avoid the appearance of many new warm and hot pixels.

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</thead>
<tbody>
<tr>
<td>1</td>
<td>no flash short dark</td>
<td>DARK</td>
<td>ACS/WFC, ACCUM, WFC</td>
<td>DEF</td>
<td></td>
<td></td>
<td></td>
<td>10.3 Secs (10.3 Secs)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>100e flash short dark</td>
<td>DARK</td>
<td>ACS/WFC, ACCUM, WFC</td>
<td>DEF</td>
<td>FLASH=100</td>
<td></td>
<td></td>
<td>0.5 Secs (0.5 Secs)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4.2e flash short dark</td>
<td>DARK</td>
<td>ACS/WFC, ACCUM, WFC</td>
<td>DEF</td>
<td>FLASHEXP=0.3; FLASHCUR=LOW</td>
<td></td>
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<td>7.5 Secs (7.5 Secs)</td>
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