



## 12051 - Cross Calibration of NICMOS and WFC3 in the Low-Count-Rate Regime

Cycle: 17, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

### INVESTIGATORS

| <i>Name</i>                       | <i>Institution</i>                         | <i>E-Mail</i>            |
|-----------------------------------|--|--------------------------|
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### VISITS

| <i>Visit</i> | <i>Targets used in Visit</i> | <i>Configurations used in Visit</i> | <i>Orbits Used</i> | <i>Last Orbit Planner Run</i> | <i>OP Current with Visit?</i> |
|--------------|------------------------------|-------------------------------------|--------------------|-------------------------------|-------------------------------|
| 01           | (1) XMM1229                  | WFC3/IR                             | 2                  | 24-Feb-2010 21:05:50.0        | yes                           |
| 02           | (2) RDCS1252                 | WFC3/IR                             | 2                  | 24-Feb-2010 21:06:04.0        | yes                           |
| 03           | (3) ISCS1434                 | WFC3/IR                             | 2                  | 24-Feb-2010 21:06:15.0        | yes                           |
| 04           | (4) XMM2235                  | WFC3/IR                             | 2                  | 24-Feb-2010 21:06:27.0        | yes                           |

| <i>Visit</i> | <i>Targets used in Visit</i> | <i>Configurations used in Visit</i> | <i>Orbits Used</i> | <i>Last Orbit Planner Run</i> | <i>OP Current with Visit?</i> |
|--------------|------------------------------|-------------------------------------|--------------------|-------------------------------|-------------------------------|
| 05           | (5) XMM1229-NIC              | NIC2                                | 1                  | 24-Feb-2010 21:06:33.0        | yes                           |

9 Total Orbits Used

### **ABSTRACT**

NICMOS has played a key role in probing the deep near infrared regime for a decade. It has been the only instrument available to observe faint objects in the near infrared that are not observable from the ground. However, the calibration of NICMOS has turned out to be difficult in the low-count-rate regime. The NICMOS calibration team has extrapolated a power-law to describe the apparent non-linearity in the NICMOS detectors from measurements at ~50-5000 ADU/s to flux counts around 0.1-1 ADU/s. Precise measurements of faint objects (such as SNe Ia at high redshift) require us to reduce the uncertainties from this extrapolation. Here we propose to determine the absolute zeropoint for faint objects by cross-calibrating the WFC3 and NICMOS detectors in observations of early type galaxies at redshifts  $z > 1$ .

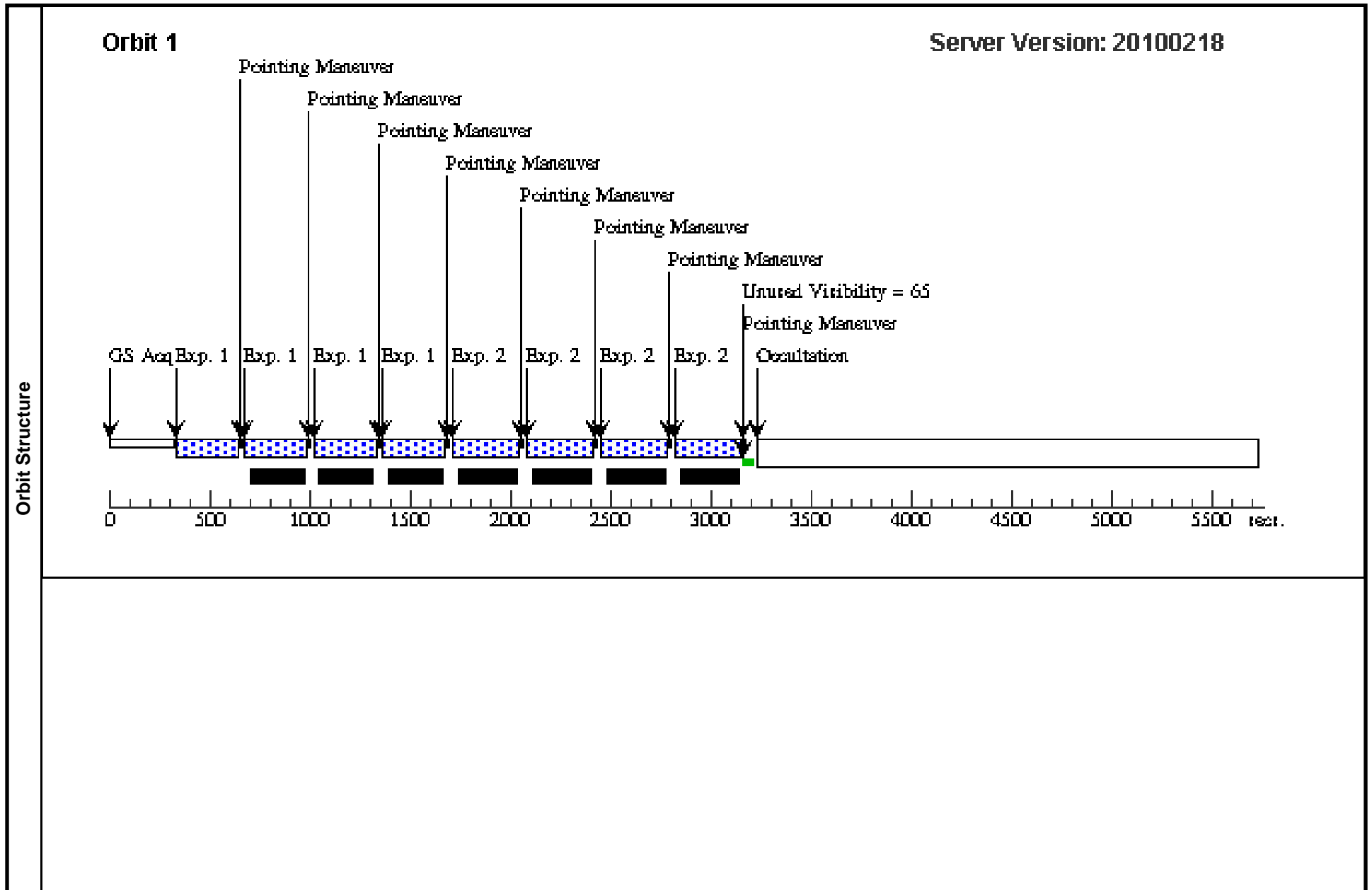
### **OBSERVING DESCRIPTION**

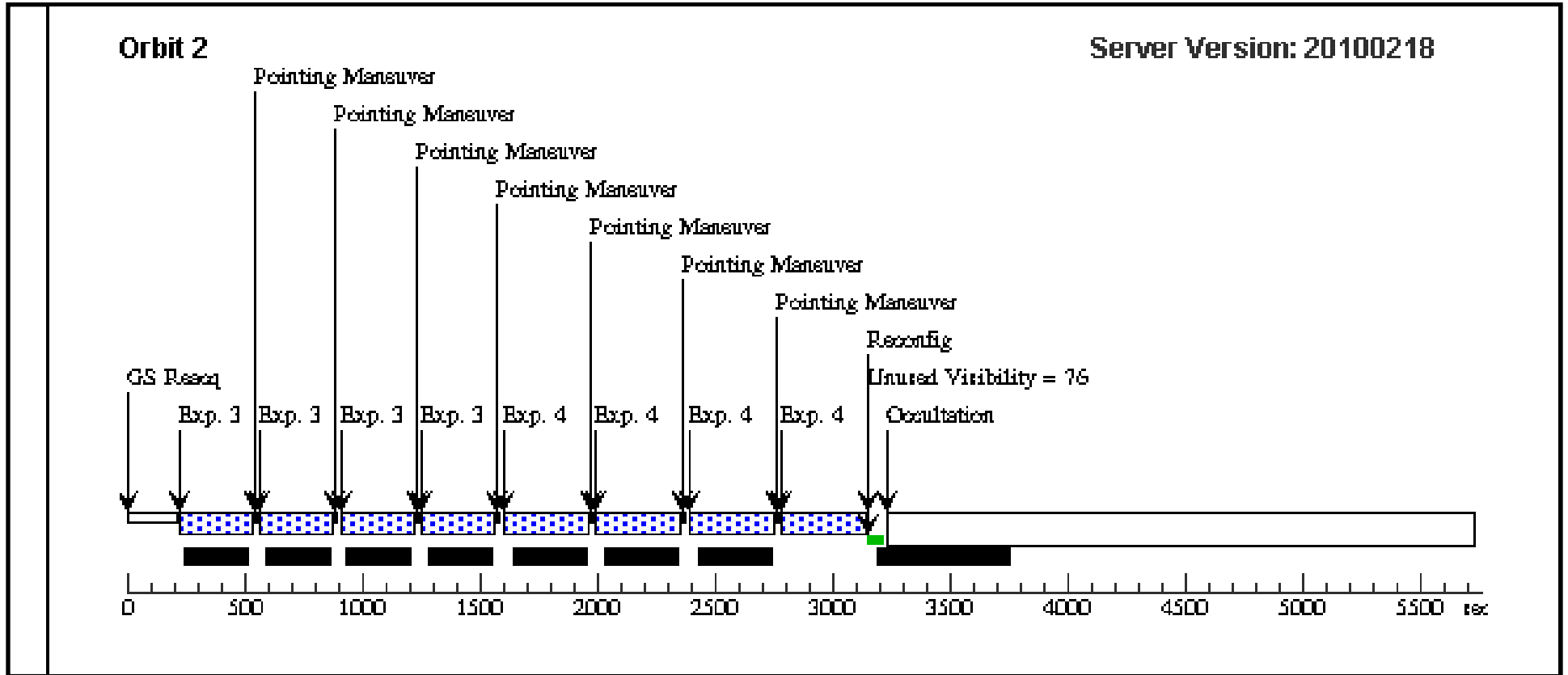
Calibration program to determine zeropoints of NICMOS/WFC3 cameras for faint objects

Proposal 12051 - Visit 01 - Cross Calibration of NICMOS and WFC3 in the Low-Count-Rate Regime

Thu Feb 25 02:06:36 GMT 2010

| Visit         | <b>Proposal 12051, Visit 01, implementation</b><br><b>Diagnostic Status: No Diagnostics</b><br>Scientific Instruments: WFC3/IR<br>Special Requirements: GYRO MODE 3GOBAD |   |   |                          |                    |                                   |               |                         |  |       |
|---------------|--|---|---|--------------------------|--------------------|-----------------------------------|---------------|-------------------------|--|-------|
|               | Patterns   | #   | Primary Pattern   | Secondary Pattern        | Exposures          |                                   |               |                         |  |       |
|               | (2)  | Pattern Type=WFC3-IR-DITHER-BOX-MIN<br>Purpose=DITHER<br>Number Of Points=4<br>Point Spacing=4.576<br>Line Spacing=2.92 | Coordinate Frame=POS-TARG<br>Pattern Orientation=18.528<br>Angle Between Sides=74.653<br>Center Pattern=false |                          | (1), (2), (3), (4) |                                   |               |                         |  |       |
| Fixed Targets | #  | Name  | Target Coordinates  | Targ. Coord. Corrections | Fluxes             | Miscellaneous                     |               |                         |  |       |
|               | (1)  | XMM1229   | RA: 12 29 28.0000 (187.3666667d)<br>Dec: +01 51 34.00 (1.85944d)<br>Equinox: J2000                            |                          | V=25<br>z=0.98     | Reference Frame: ICRS             |               |                         |  |       |
| Exposures     | #  | Label   | Target  | Config,Mode,Aperture     | Spectral Els.      | Opt. Params.                      | Special Reqs. | Groups                  | Exp. Time/[Actual Dur.]  | Orbit |
|               | 1  |   | (1) XMM1229   | WFC3/IR, MULTIACCUM, IR  | F110W              | SAMP-SEQ=SPARS<br>25;<br>NSAMP=12 |               | Pattern 2, Exps 1-1 (2) | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [1]   |
|               | 2  |   | (1) XMM1229   | WFC3/IR, MULTIACCUM, IR  | F125W              | NSAMP=13;<br>SAMP-SEQ=SPAR<br>S25 |               | Pattern 2, Exps 2-2 (2) | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [1]   |
|               | <i>Comments: Please adjust NSAMP to fill time allocated to orbit</i>   |   |   |                          |                    |                                   |               |                         |  |       |
|               | 3  |   | (1) XMM1229   | WFC3/IR, MULTIACCUM, IR  | F160W              | NSAMP=12;<br>SAMP-SEQ=SPAR<br>S25 |               | Pattern 2, Exps 3-3 (2) | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [2]   |
|               | 4  |   | (1) XMM1229   | WFC3/IR, MULTIACCUM, IR  | F105W              | NSAMP=14;<br>SAMP-SEQ=SPAR<br>S25 |               | Pattern 2, Exps 4-4 (2) | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [2]   |

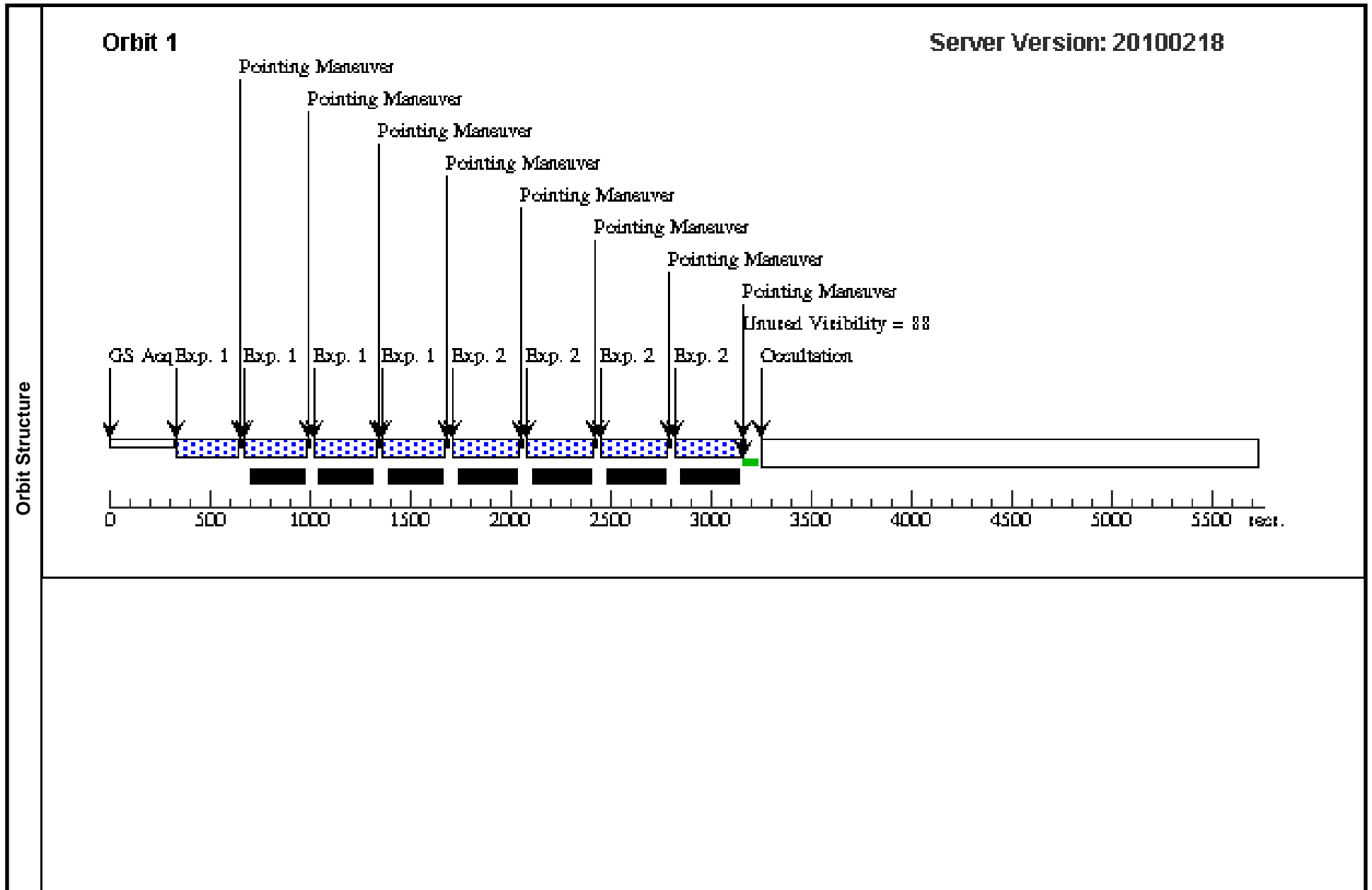


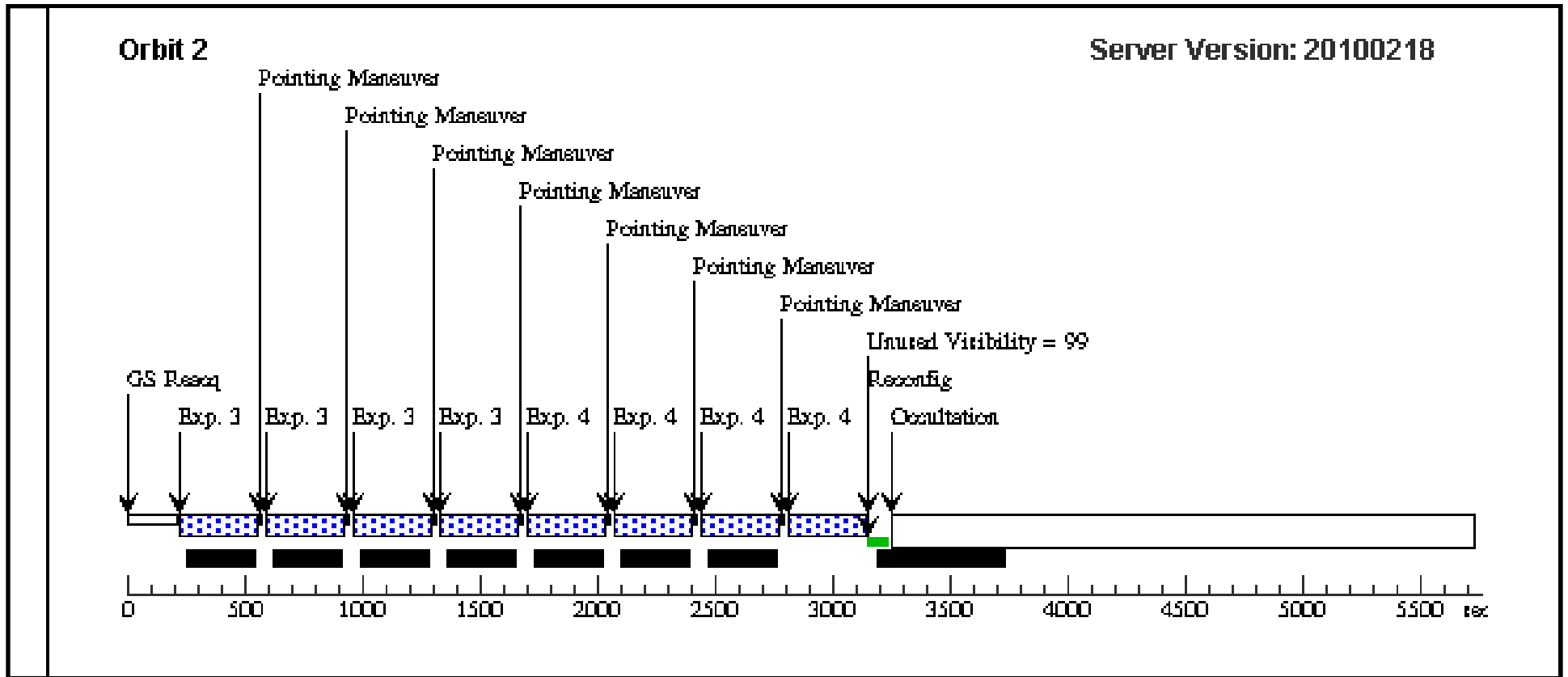


Proposal 12051 - Visit 02 - Cross Calibration of NICMOS and WFC3 in the Low-Count-Rate Regime

Thu Feb 25 02:06:37 GMT 2010

|   |  |   |   |  |   |   |  |  |                       |
|---|--|---|---|--|---|---|--|--|-----------------------|
| <b>Visit</b>  | <b>Proposal 12051, Visit 02, implementation</b><br><b>Diagnostic Status: No Diagnostics</b><br>Scientific Instruments: WFC3/IR<br>Special Requirements: GYRO MODE 3GOBAD |   |   |  |   |   |  |  |                       |
|   | <b>Patterns</b>  | # <b>Primary Pattern</b><br>(2) Pattern Type=WFC3-IR-DITHER-BOX-MIN<br>Purpose=DITHER<br>Number Of Points=4<br>Point Spacing=4.576<br>Line Spacing=2.92 | Coordinate Frame=POS-TARG<br>Pattern Orientation=18.528<br>Angle Between Sides=74.653<br>Center Pattern=false | # <b>Secondary Pattern</b><br>(1), (2), (3), (4) |   |   |  |  |                       |
| <b>Fixed Targets</b>  | # <b>Name</b><br>(2) RDCS1252  | # <b>Target Coordinates</b><br>RA: 12 52 54.4000 (193.2266667d)<br>Dec: -29 27 15.00 (-29.45417d)<br>Equinox: J2000                                     | # <b>Targ. Coord. Corrections</b><br>V=25<br>z=1.23   | # <b>Fluxes</b><br>Reference Frame: ICRS         |   |   |  |  |                       |
| <b>Exposures</b>  | # <b>Label</b><br>1 (2) RDCS1252   | # <b>Target</b><br>(2) RDCS1252   | # <b>Config,Mode,Aperture</b><br>WFC3/IR, MULTIACCUM, IR  | # <b>Spectral Els.</b><br>F110W                  | # <b>Opt. Params.</b><br>SAMP-SEQ=SPARS 25;<br>NSAMP=12 | # <b>Special Reqs.</b><br>Pattern 2, Exps 1-1 (2) | # <b>Groups</b><br>Pattern 2, Exps 1-1 (2) | # <b>Exp. Time/[Actual Dur.]</b><br>[==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | # <b>Orbit</b><br>[1] |
| Comments: Please adjust NSAMP to fill time allocated to orbit |  |   |   |  |   |   |  |  |                       |
|   | 2 (2) RDCS1252   | (2) RDCS1252  | WFC3/IR, MULTIACCUM, IR   | F125W  | NSAMP=13;<br>SAMP-SEQ=SPAR S25                          | Pattern 2, Exps 2-2 (2)                           | Pattern 2, Exps 2-2 (2)                    | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)]                                     | [1]                   |
|   | 3 (2) RDCS1252   | (2) RDCS1252  | WFC3/IR, MULTIACCUM, IR   | F105W  | NSAMP=13;<br>SAMP-SEQ=SPAR S25                          | Pattern 2, Exps 3-3 (2)                           | Pattern 2, Exps 3-3 (2)                    | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)]                                     | [2]                   |
|   | 4 (2) RDCS1252   | (2) RDCS1252  | WFC3/IR, MULTIACCUM, IR   | F160W  | NSAMP=13;<br>SAMP-SEQ=SPAR S25                          | Pattern 2, Exps 4-4 (2)                           | Pattern 2, Exps 4-4 (2)                    | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)]                                     | [2]                   |

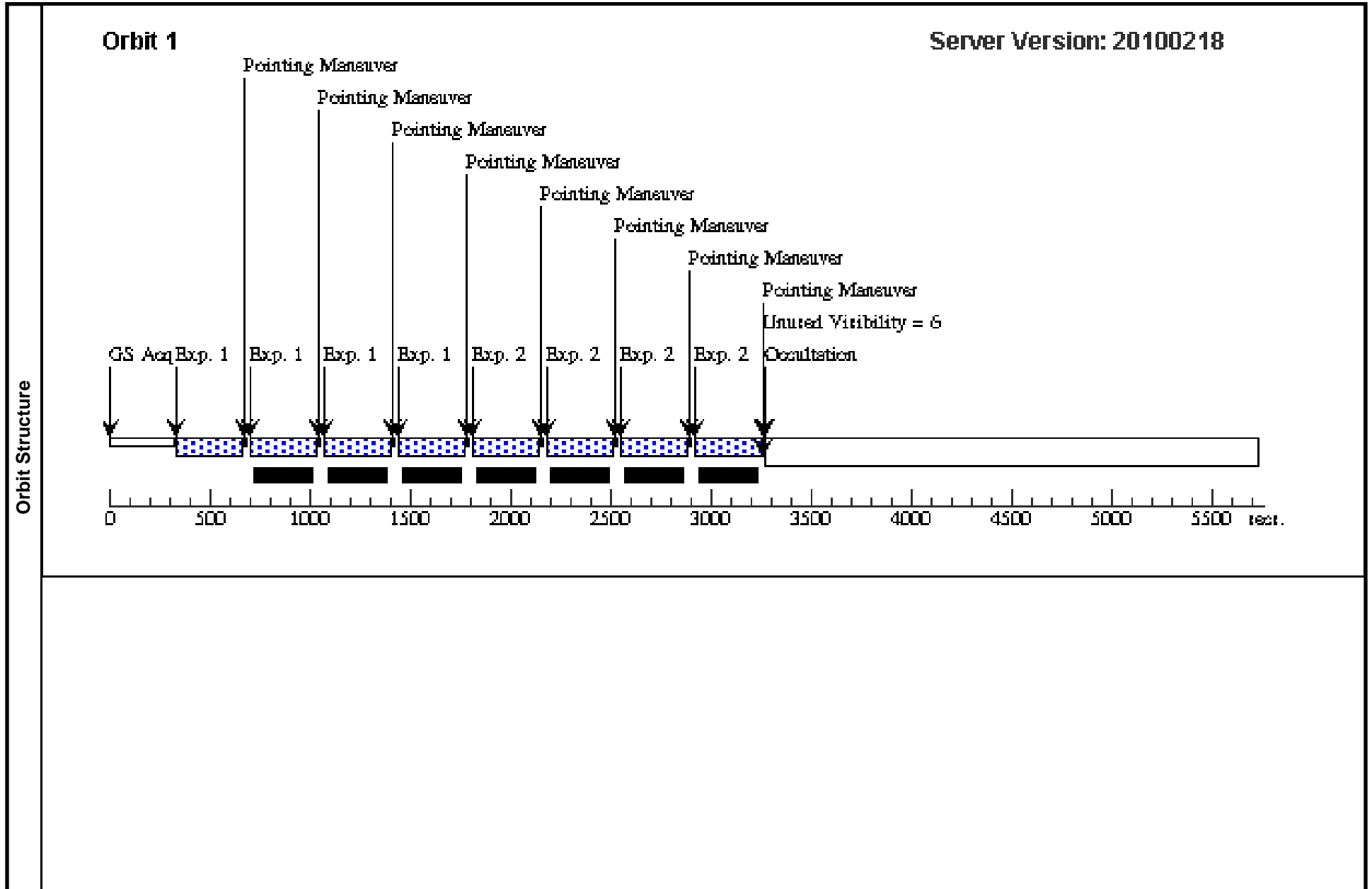


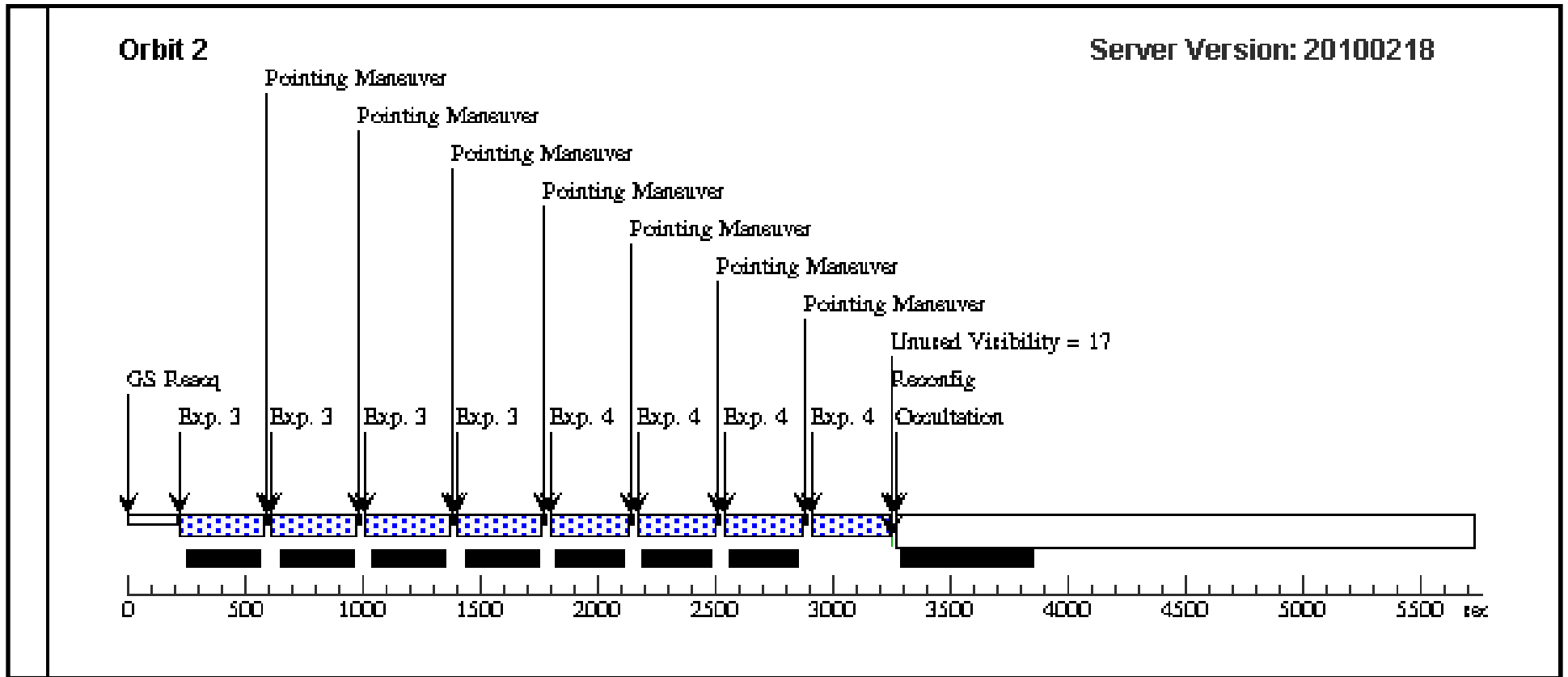


Proposal 12051 - Visit 03 - Cross Calibration of NICMOS and WFC3 in the Low-Count-Rate Regime

Thu Feb 25 02:06:38 GMT 2010

|                      |   |   |   |                                 |                                   |                                   |                      |                         |  |  |     |
|----------------------|---|---|---|---------------------------------|-----------------------------------|-----------------------------------|----------------------|-------------------------|--|--|-----|
| <b>Visit</b>         | <b>Proposal 12051, Visit 03, completed</b><br><b>Diagnostic Status: No Diagnostics</b><br>Scientific Instruments: WFC3/IR<br>Special Requirements: GYRO MODE 3GOBAD |   |   |                                 |                                   |                                   |                      |                         |  |  |     |
|                      |   |   |   |                                 |                                   |                                   |                      |                         |  |  |     |
| <b>Patterns</b>      | <b>#</b>  | <b>Primary Pattern</b>  | <b>Secondary Pattern</b>  | <b>Exposures</b>                |                                   |                                   |                      |                         |  |  |     |
|                      | (2)   | Pattern Type=WFC3-IR-DITHER-BOX-MIN<br>Purpose=DITHER<br>Number Of Points=4<br>Point Spacing=4.576<br>Line Spacing=2.92 | Coordinate Frame=POS-TARG<br>Pattern Orientation=18.528<br>Angle Between Sides=74.653<br>Center Pattern=false | (1), (2), (3), (4)              |                                   |                                   |                      |                         |  |  |     |
| <b>Fixed Targets</b> | <b>#</b>  | <b>Name</b>   | <b>Target Coordinates</b>   | <b>Targ. Coord. Corrections</b> | <b>Fluxes</b>                     | <b>Miscellaneous</b>              |                      |                         |  |  |     |
|                      | (3)   | ISCS1434  | RA: 14 34 29.3000 (218.6220833d)<br>Dec: +34 26 40.00 (34.44444d)<br>Equinox: J2000                           |                                 | V=25<br>z=1.24                    | Reference Frame: ICRS             |                      |                         |  |  |     |
| <b>Exposures</b>     | <b>#</b>  | <b>Label</b>  | <b>Target</b>   | <b>Config,Mode,Aperture</b>     | <b>Spectral Els.</b>              | <b>Opt. Params.</b>               | <b>Special Reqs.</b> | <b>Groups</b>           | <b>Exp. Time/[Actual Dur.]</b>   | <b>Orbit</b>   |     |
|                      | 1   | (3) ISCS1434  | (3) ISCS1434  | WFC3/IR, MULTIACCUM, IR         | F110W                             | SAMP-SEQ=SPARS<br>25;<br>NSAMP=13 |                      | Pattern 2, Exps 1-1 (2) | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [1]  |     |
|                      | 2   | (3) ISCS1434  | (3) ISCS1434  | WFC3/IR, MULTIACCUM, IR         | F125W                             | NSAMP=13;<br>SAMP-SEQ=SPAR<br>S25 |                      | Pattern 2, Exps 2-2 (2) | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [1]  |     |
|                      | <i>Comments: Please adjust NSAMP to fill time allocated to orbit</i>  |   |   |                                 |                                   |                                   |                      |                         |  |  |     |
|                      | 3   | (3) ISCS1434  | (3) ISCS1434  | WFC3/IR, MULTIACCUM, IR         | F105W                             | NSAMP=14;<br>SAMP-SEQ=SPAR<br>S25 |                      |                         | Pattern 2, Exps 3-3 (2)  | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [2] |
| 4                    | (3) ISCS1434  | (3) ISCS1434  | WFC3/IR, MULTIACCUM, IR   | F160W                           | NSAMP=13;<br>SAMP-SEQ=SPAR<br>S25 |                                   |                      | Pattern 2, Exps 4-4 (2) | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [2]  |     |

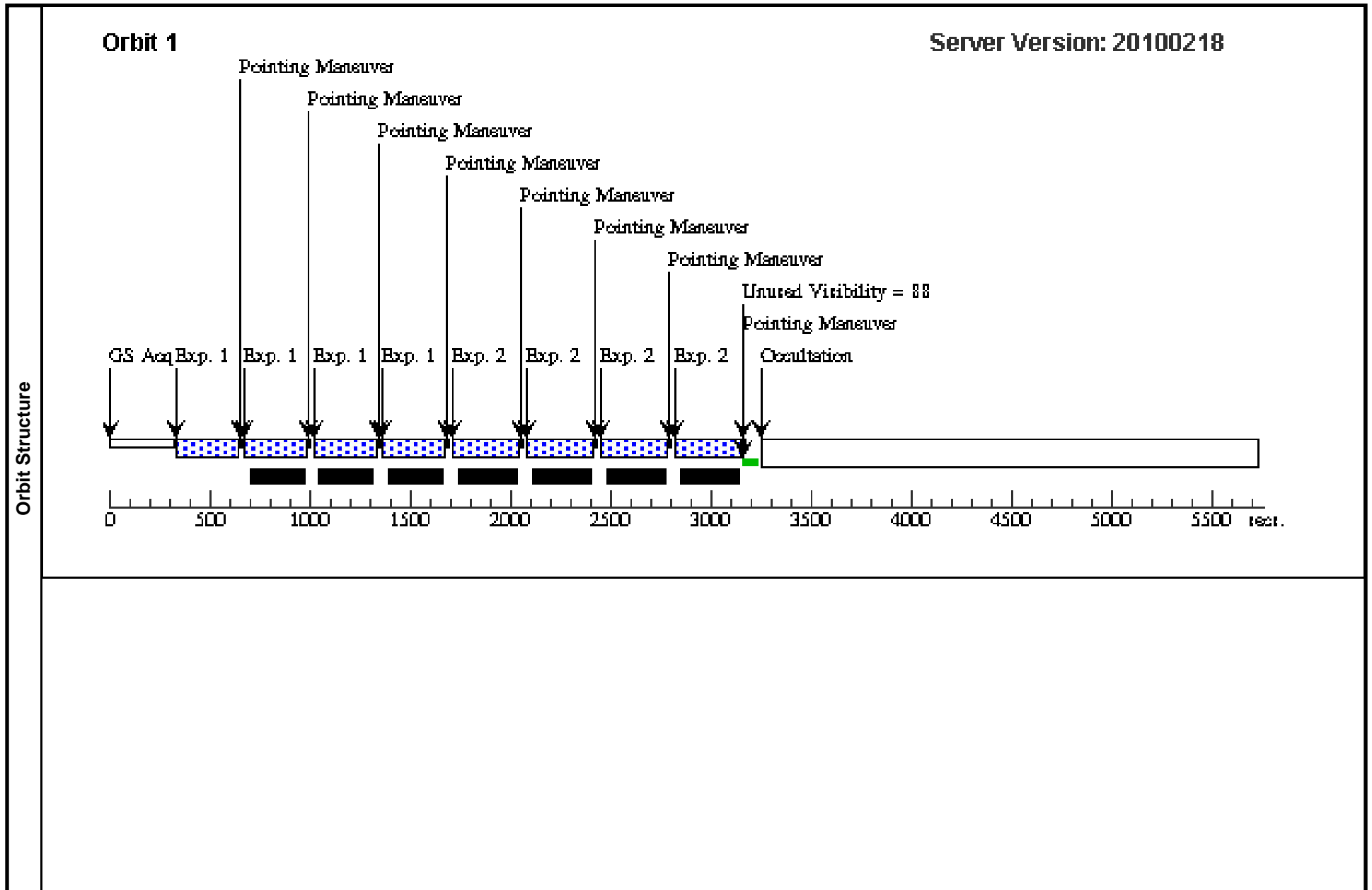


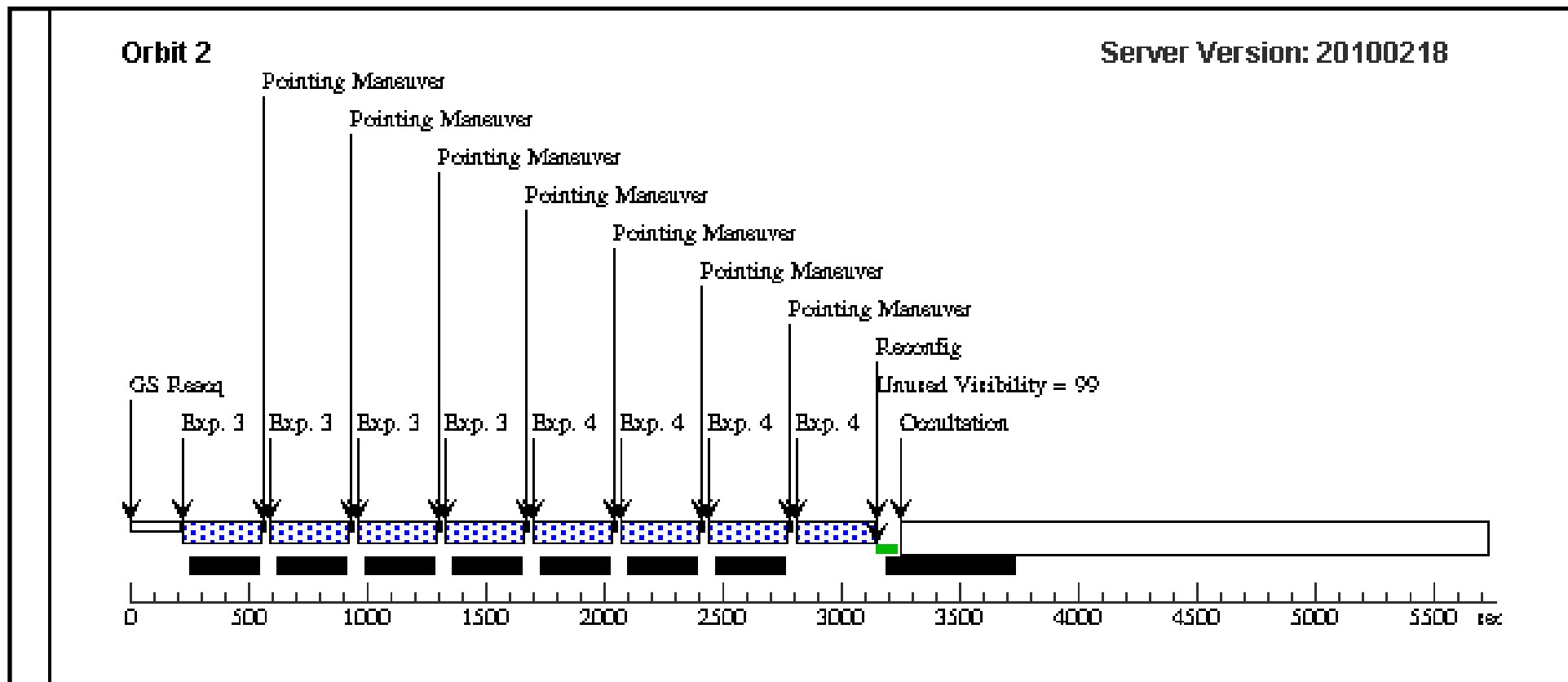


Proposal 12051 - Visit 04 - Cross Calibration of NICMOS and WFC3 in the Low-Count-Rate Regime

Thu Feb 25 02:06:39 GMT 2010

| Visit         | <b>Proposal 12051, Visit 04, implementation</b><br><b>Diagnostic Status: No Diagnostics</b><br>Scientific Instruments: WFC3/IR<br>Special Requirements: GYRO MODE 3GOBAD |             |   |   |                |                                   |                                   |                         |  |  |     |
|---------------|--|-------------|---|---|----------------|-----------------------------------|-----------------------------------|-------------------------|--|--|-----|
|               | Patterns   | #           | Primary Pattern   | Secondary Pattern   | Exposures      |                                   |                                   |                         |  |  |     |
|               |  | (2)         | Pattern Type=WFC3-IR-DITHER-BOX-MIN<br>Purpose=DITHER<br>Number Of Points=4<br>Point Spacing=4.576<br>Line Spacing=2.92 | Coordinate Frame=POS-TARG<br>Pattern Orientation=18.528<br>Angle Between Sides=74.653<br>Center Pattern=false |                | (1), (2), (3), (4)                |                                   |                         |  |  |     |
| Fixed Targets | #  | Name        | Target Coordinates  | Targ. Coord. Corrections  | Fluxes         | Miscellaneous                     |                                   |                         |  |  |     |
|               | (4)  | XMM2235     | RA: 22 35 21.5000 (338.8395833d)<br>Dec: -25 57 25.00 (-25.95694d)<br>Equinox: J2000                                    |   | V=25<br>z=1.39 | Reference Frame: ICRS             |                                   |                         |  |  |     |
| Exposures     | #  | Label       | Target  | Config,Mode,Aperture  | Spectral Els.  | Opt. Params.                      | Special Reqs.                     | Groups                  | Exp. Time/[Actual Dur.]  | Orbit  |     |
|               | 1  |             | (4) XMM2235   | WFC3/IR, MULTIACCUM, IR   | F110W          | SAMP-SEQ=SPARS<br>25;<br>NSAMP=12 |                                   | Pattern 2, Exps 1-1 (2) | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [1]  |     |
|               | 2  |             | (4) XMM2235   | WFC3/IR, MULTIACCUM, IR   | F125W          | NSAMP=13;<br>SAMP-SEQ=SPAR<br>S25 |                                   | Pattern 2, Exps 2-2 (2) | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [1]  |     |
|               | <i>Comments: Please adjust NSAMP to fill time allocated to orbit</i>   |             |   |   |                |                                   |                                   |                         |  |  |     |
|               | 3  |             | (4) XMM2235   | WFC3/IR, MULTIACCUM, IR   | F105W          |                                   | NSAMP=13;<br>SAMP-SEQ=SPAR<br>S25 |                         | Pattern 2, Exps 3-3 (2)  | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [2] |
| 4             |  | (4) XMM2235 | WFC3/IR, MULTIACCUM, IR   | F160W   |                | NSAMP=13;<br>SAMP-SEQ=SPAR<br>S25 |                                   | Pattern 2, Exps 4-4 (2) | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)] | [2]  |     |





Proposal 12051 - Visit 05 - Cross Calibration of NICMOS and WFC3 in the Low-Count-Rate Regime

Thu Feb 25 02:06:40 GMT 2010

|  |   |   |  |                             |                                   |                              |                          |  |                                |              |
|--|---|---|--|-----------------------------|-----------------------------------|------------------------------|--------------------------|--|--------------------------------|--------------|
| <b>Visit</b>   | <b>Proposal 12051, Visit 05, implementation</b><br><b>Diagnostic Status: No Diagnostics</b><br>Scientific Instruments: NIC2<br>Special Requirements: (none) |   |  |                             |                                   |                              |                          |  |                                |              |
|  | <b>Patterns</b>   | <b>#</b>  | <b>Primary Pattern</b>   |                             |                                   |                              | <b>Secondary Pattern</b> |  |                                |              |
| (1)  |   | Pattern Type=NIC-SPIRAL-DITH<br>Purpose=DITHER<br>Number Of Points=7<br>Point Spacing=1.5375<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=0.0<br>Angle Between Sides=<br>Center Pattern=false |                             |                                   |                              |                          | (1)  |                                |              |
| <b>Fixed Targets</b>   | <b>#</b>  | <b>Name</b>   | <b>Target Coordinates</b>  |                             | <b>Targ. Coord. Corrections</b>   |                              | <b>Fluxes</b>            |  | <b>Miscellaneous</b>           |              |
|  | (5)   | XMM1229-NIC   | RA: 12 29 28.1700 (187.3673750d)<br>Dec: +01 52 8.98 (1.86916d)<br>Equinox: J2000                    |                             |                                   |                              |                          | V=25<br>z=0.98   | Reference Frame: ICRS          |              |
| <b>Exposures</b>   | <b>#</b>  | <b>Label</b>  | <b>Target</b>  | <b>Config,Mode,Aperture</b> | <b>Spectral Els.</b>              | <b>Opt. Params.</b>          | <b>Special Reqs.</b>     | <b>Groups</b>  | <b>Exp. Time/[Actual Dur.]</b> | <b>Orbit</b> |
|  | 1   | (5) XMM1229-NIC   | NIC2, MULTIACCUM, NIC2   | F110W                       | SAMP-SEQ=SPARS<br>16;<br>NSAMP=25 | GS ACQ SCENARI<br>O BASE1BNS | Pattern 1, Exps 1-1 (1)  | [==>(Pattern 1)]<br>[==>(Pattern 2)]<br>[==>(Pattern 3)]<br>[==>(Pattern 4)]<br>[==>(Pattern 5)]<br>[==>(Pattern 6)]<br>[==>(Pattern 7)] | [1]                            |              |
| <i>Comments: Please adjust NSAMP to fill time allocated to orbit</i> |   |   |  |                             |                                   |                              |                          |  |                                |              |

