# 13378 - Toward A Comprehensive Kinematic and Chemical Survey of the Young O-rich SNR 1E 0102-7219 in the SMC

Cycle: 21, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

**INVESTIGATORS**



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|---|---|---|
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**VISITS**

| *Visit* | *Targets used in Visit* | *Configurations used in Visit* | *Orbits Used* | *Last Orbit Planner Run* | *OP Current with Visit?* |
|---|---|---|---|---|---|
| 01 | (1) 1E-0102.2-7219 | WFC3/UVIS | 3 | 11-Jul-2013 18:08:16.0 | yes |
| 02 | (1) 1E-0102.2-7219 | WFC3/UVIS | 3 | 11-Jul-2013 18:08:35.0 | yes |
| 03 | (1) 1E-0102.2-7219 | WFC3/UVIS | 4 | 11-Jul-2013 18:08:59.0 | yes |

10 Total Orbits Used

**ABSTRACT**

We propose the first comprehensive UV and optical imaging survey of the young, oxygen-rich, SMC supernova remnant 1E 0102-7219 (E0102). These data will be coordinated with an optical spectroscopic survey of E0102 already in progress that has uncovered previously unknown high velocity S-rich ejecta and an elaborate bubble-like, large-scale ejecta structure having a velocity distribution that spans more than twice the currently accepted mean value.

Combining the proposed WFC3 UV and optical imaging with our recent spectroscopic survey will allow: (1) the first complete mapping of E0102's high and low velocity metal-rich ejecta, (2) a first-of-its-kind map of UV emission in [Ne IV] 2425 and Mg II 2800 of an O-rich SNR, (3) identification of remnant regions exhibiting sulfur emission associated with the inner Si,S,Ca,Ar layer of the progenitor star, (4) investigation of an expected population of exceptionally high velocity, outer knots like those seen in Cas A, (5) calculation of an accurate mean expansion velocity and age via proper motions using archival HST data, and (6) creation of a high-resolution 3D kinematic and chemical reconstruction of E0102's UV and optically emitting ejecta.

This data set will reveal E0102's full structure in extraordinary detail, and provide powerful insights on the dynamics and nucleosynthesis yields of high-mass progenitor core-collapse supernova explosion models. It will also set the stage for more expansive multi-wavelength studies that can incorporate the already rich data available in Chandra X-ray and Spitzer infrared observations.

**OBSERVING DESCRIPTION**

We request a suite of UV and optical WFC3/UVIS images of E0102 taken over a total of 10 orbits. E0102 is a faint SNR and we have chosen narrow filters because our experience imaging Cas A has shown dramatic differences in sensitivity between broad- and narrow-band filters. Some of the observations will use the quad filters, which we are aware have 1/6 the field of view (FOV) of the WFC3/UVIS and will necessitate a two tile mosaic to image the entire remnant that is some 30" in diameter. This will introduce additional overhead that has been incorporated into our requested number of orbits.

We have used archival FOS spectra of E0102 (Figure 5) and the WFC3 ETC employing a 5x5 extraction region to estimate exposure lengths. Most images will have total exposure lengths between 1500-2400 s, broken up into three- or four-point dithered images to achieve the best S/N and high

resolutions we desire. The UV images will require additional time. The breakdown of the orbits follow below.

Two orbits will be used for UV images. The FQ243N and F280N filters will map the [Ne IV] and Mg II 2800 emission. The ETC calculates that the F280N and FQ243N images with total exposure lengths of 2400-3000 s will yield images of S/N>10. Five orbits are allocated for the [O III] and [O II] maps. The combination of the FQ492N, F502N, and FQ508N filters will maximize sensitivity for the [O III] 4959, 5007 lines and probe the entire extent of the ejecta velocities revealed in our survey while minimizing background light. These filters will divide the remnant up into the blueshifted, low velocity, and redshifted regions, and will go deeper than previous ACS/WFC images. Anticipated proper motions between our data and an archival 2003 F475W image will be 0.07".

Two orbits are allocated for [S II] 6716, 6731 imaging. Both the F665N and F673N filters will sample the full velocity range of the S-rich ejecta. We note that the standard F673N filter alone would entirely miss the high-velocity [S II] emission uncovered in our spectroscopic survey (Figure 3).

One orbit is allocated for [N II]+Halpha imaging. A large population of outer, exceptionally high velocity ejecta knots in Cas A have recently been uncovered that show strong [N II]+Halpha emissions. Our proposed F657N image can be compared with an archival WFC/ACS F658N image obtained in 2003 to determine whether a similar population exists around E0102. A comparable population with velocities > 10,000 km s would show a total proper motion shift of > 0.3", or approximately 7 pixels over the ten years separating the images. A F645N contains no significant emission lines and will be used for continuum and star subtraction for the F657N, F665N, and F673N filters.

## Visit

**Proposal 13378, Visit 01** Thu Jul 11 22:09:12 GMT 2013

**Diagnostic Status: Warning**

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 40D TO 50 D; ORIENT 220D TO 230 D

## Diagnostics

(Exposure 1 (Pattern 8, Exps 1-1 in Visit 01) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

(Exposure 2 (Pattern 7, Exps 2-2 in Visit 01) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

(Exposure 3 (Pattern 6, Exps 3-3 in Visit 01)) Warning (Form): POS TARG & PATTERN should be used carefully with ACS ramp or WFC3 quad filters as central wavelengths & transmission efficiencies vary within the apertures.

(Exposure 4 (Pattern 9, Exps 4-4 in Visit 01)) Warning (Form): POS TARG & PATTERN should be used carefully with ACS ramp or WFC3 quad filters as central wavelengths & transmission efficiencies vary within the apertures.

## Patterns

| # | Primary Pattern | | Secondary Pattern | Exposures |
|---|---|---|---|---|
| (4) | Pattern Type=WFC3-UVIS-DITHER-BOX<br>Purpose=DITHER<br>Number Of Points=4<br>Point Spacing=4.5<br>Line Spacing=3.5 | Coordinate Frame=POS-TARG<br>Pattern Orientation=23.884<br>Angle Between Sides=81.785<br>Center Pattern=false | | (5) |
| (6) | Pattern Type=WFC3-UVIS-DITHER-BOX<br>Purpose=DITHER<br>Number Of Points=4<br>Point Spacing=0.173<br>Line Spacing=0.112 | Coordinate Frame=POS-TARG<br>Pattern Orientation=23.884<br>Angle Between Sides=81.785<br>Center Pattern=false | | (3) |
| (7) | Pattern Type=WFC3-UVIS-GAP-LINE<br>Purpose=MOSAIC<br>Number Of Points=2<br>Point Spacing=2.414<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=85.759<br>Angle Between Sides=<br>Center Pattern=true | | (2) |
| (8) | Pattern Type=WFC3-UVIS-GAP-LINE<br>Purpose=MOSAIC<br>Number Of Points=3<br>Point Spacing=2.414<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=85.759<br>Angle Between Sides=<br>Center Pattern=true | | (1) |
| (9) | Pattern Type=WFC3-UVIS-DITHER-LINE<br>Purpose=DITHER<br>Number Of Points=2<br>Point Spacing=0.145<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=46.84<br>Angle Between Sides=<br>Center Pattern=false | | (4) |

## Fixed Targets

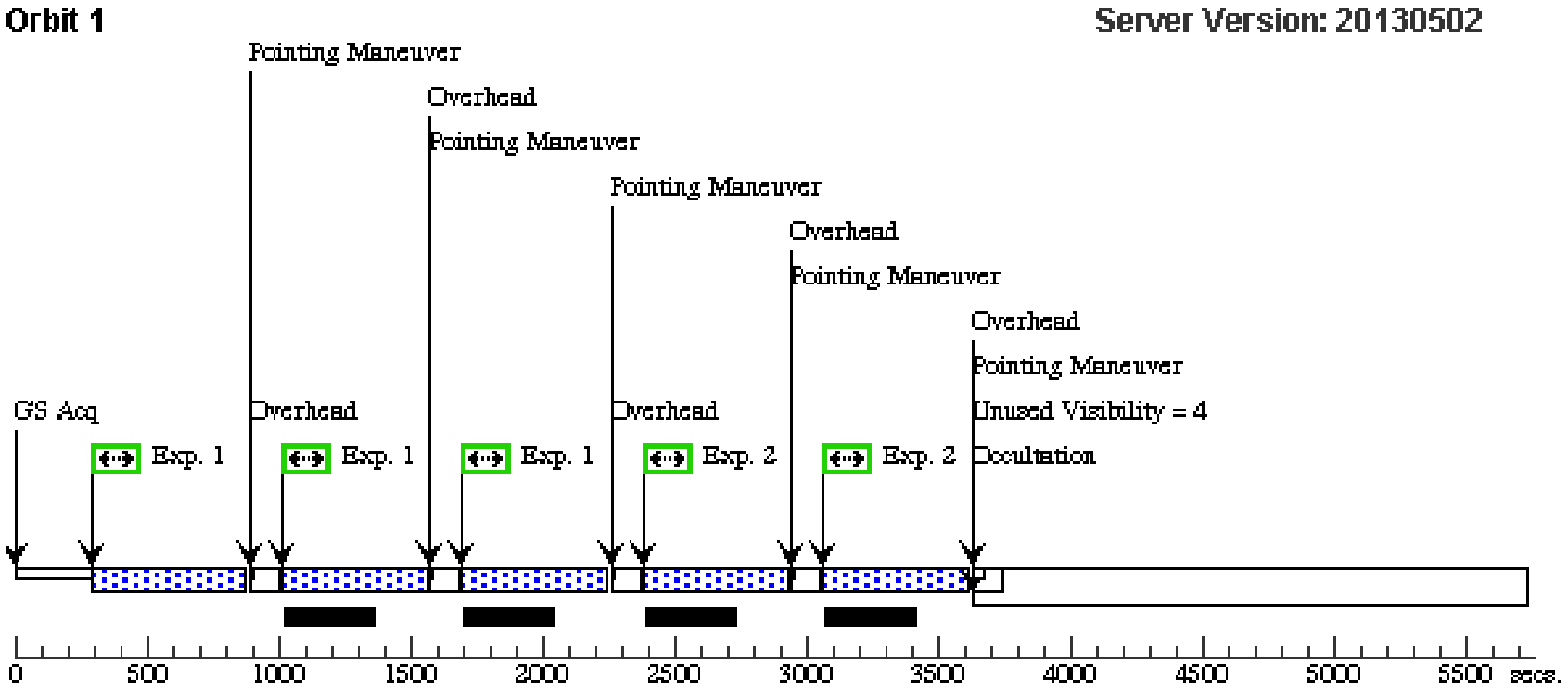
| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | 1E-0102.2-7219 | RA: 01 04 1.9600 (16.0081667d)<br>Dec: -72 01 53.73 (-72.03159d)<br>Equinox: J2000 | | V=17+/-1 | Reference Frame: SIMBAD |

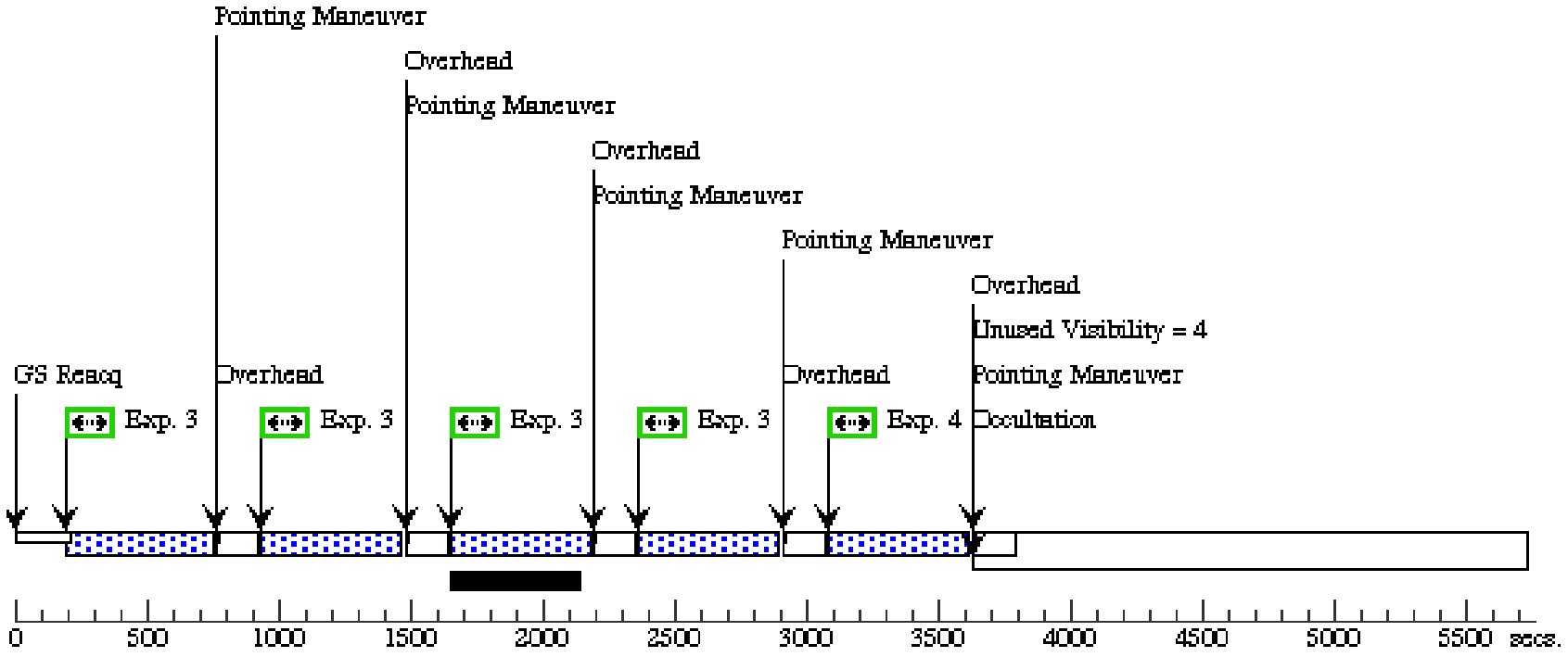
*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*

**Exposures**

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F280N | FLASH=12 | POS TARG null,-4.77 | Pattern 8, Exps 1-1 in Visit 01 (8) | 550 Secs (1650 Secs) | |
| | | | | | | | | *[==>(Pattern 1)]* | ***[1]*** |
| | | | | | | | | *[==>(Pattern 2)]* | |
| | | | | | | | | *[==>(Pattern 3)]* | |
| 2 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F280N | FLASH=12 | POS TARG 0.5,-4.77 | Pattern 7, Exps 2-2 in Visit 01 (7) | 550 Secs (1100 Secs) | |
| | | | | | | | | *[==>(Pattern 1)]* | ***[1]*** |
| | | | | | | | | *[==>(Pattern 2)]* | |
| 3 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-QUAD-SUB | FQ243N | FLASH=12 | | Pattern 6, Exps 3-3 in Visit 01 (6) | 533 Secs (2132 Secs) | |
| | | | | | | | | *[==>(Pattern 1)]* | ***[2]*** |
| | | | | | | | | *[==>(Pattern 2)]* | |
| | | | | | | | | *[==>(Pattern 3)]* | |
| | | | | | | | | *[==>(Pattern 4)]* | |
| 4 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-QUAD-SUB | FQ243N | FLASH=12 | POS TARG 0.15,-0.15 | Pattern 9, Exps 4-4 in Visit 01 (9) | 533 Secs (1066 Secs) | |
| | | | | | | | | *[==>(Pattern 1)]* | ***[2]*** |
| | | | | | | | | *[==>(Pattern 2)]* | ***[3]*** |
| 5 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F373N | FLASH=12 | POS TARG null,-6 | Pattern 4, Exps 5-5 in Visit 01 (4) | 567 Secs (2268 Secs) | |
| | | | | | | | | *[==>(Pattern 1)]* | ***[3]*** |
| | | | | | | | | *[==>(Pattern 2)]* | |
| | | | | | | | | *[==>(Pattern 3)]* | |
| | | | | | | | | *[==>(Pattern 4)]* | |

Orbit Structure

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Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Pointing Maneuver
Overhead
Unused Visibility = 4
GS Reacq
Overhead
Overhead
Pointing Maneuver
Exp. 3
Exp. 3
Exp. 3
Exp. 3
Exp. 4
Occultation
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500
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2500
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3500
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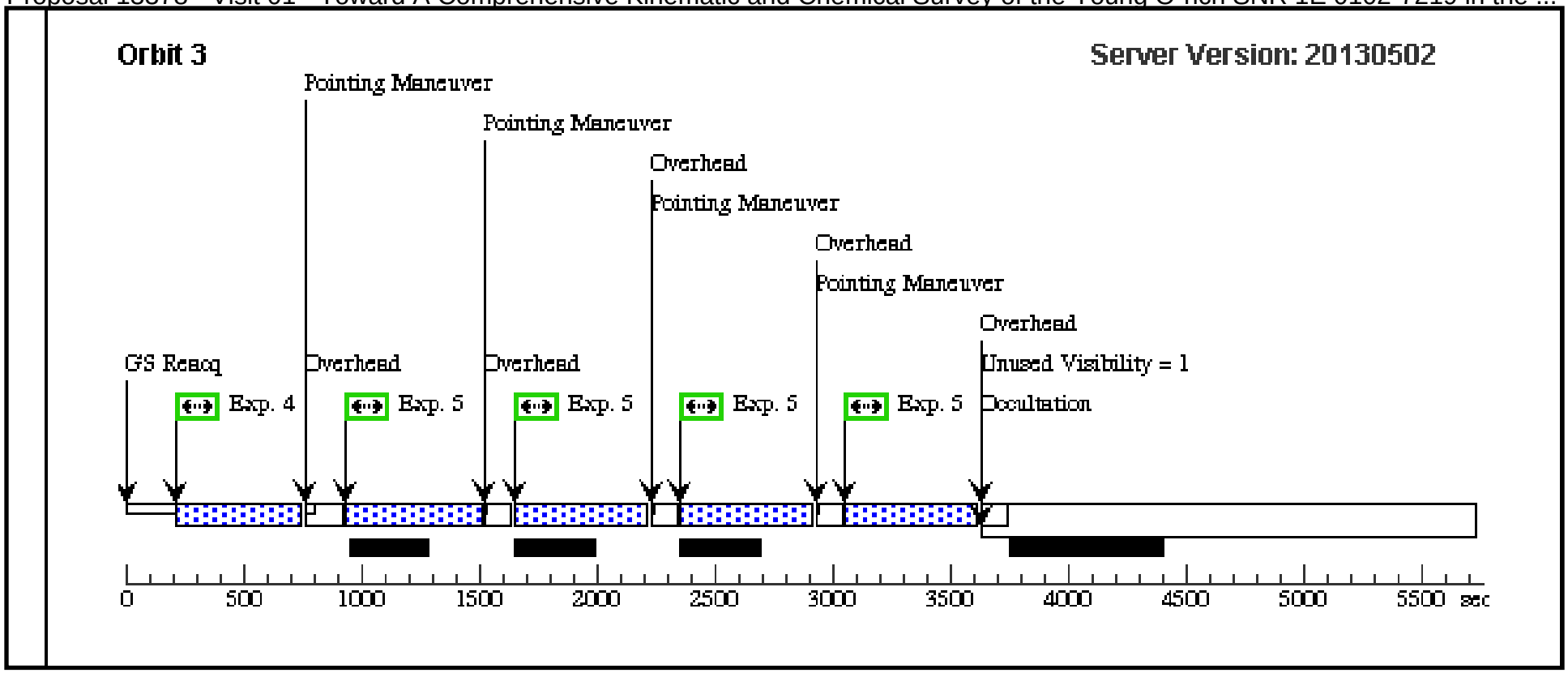
5000
5500
secs.


Orbit 3
Server Version: 20130502
Pointing Maneuver
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Unused Visibility = 1
GS Reacq
Overhead
Overhead
Occultation
Exp. 4
Exp. 5
Exp. 5
Exp. 5
Exp. 5
Exp. 5
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

## Visit

**Proposal 13378, Visit 02** Thu Jul 11 22:09:15 GMT 2013

**Diagnostic Status: Warning**

Scientific Instruments: WFC3/UVIS

Special Requirements: SAME ORIENT AS 01

## Diagnostics

(Exposure 1 (Pattern 8, Exps 1-1 in Visit 02) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

(Exposure 2 (Pattern 7, Exps 2-2 in Visit 02) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

(Exposure 3 (Pattern 6, Exps 3-3 in Visit 02)) Warning (Form): POS TARG & PATTERN should be used carefully with ACS ramp or WFC3 quad filters as central wavelengths & transmission efficiencies vary within the apertures.

(Exposure 4 (Visit 02)) Warning (Form): POS TARG & PATTERN should be used carefully with ACS ramp or WFC3 quad filters as central wavelengths & transmission efficiencies vary within the apertures.

(Exposure 5 (Pattern 6, Exps 5-5 in Visit 02)) Warning (Form): POS TARG & PATTERN should be used carefully with ACS ramp or WFC3 quad filters as central wavelengths & transmission efficiencies vary within the apertures.

(Exposure 6 (Visit 02)) Warning (Form): POS TARG & PATTERN should be used carefully with ACS ramp or WFC3 quad filters as central wavelengths & transmission efficiencies vary within the apertures.

## Patterns

| # | Primary Pattern | | Secondary Pattern | Exposures |
|---|---|---|---|---|
| (6) | Pattern Type=WFC3-UVIS-DITHER-BOX<br>Purpose=DITHER<br>Number Of Points=4<br>Point Spacing=0.173<br>Line Spacing=0.112 | Coordinate Frame=POS-TARG<br>Pattern Orientation=23.884<br>Angle Between Sides=81.785<br>Center Pattern=false | | (3), (5) |
| (7) | Pattern Type=WFC3-UVIS-GAP-LINE<br>Purpose=MOSAIC<br>Number Of Points=2<br>Point Spacing=2.414<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=85.759<br>Angle Between Sides=<br>Center Pattern=true | | (2) |
| (8) | Pattern Type=WFC3-UVIS-GAP-LINE<br>Purpose=MOSAIC<br>Number Of Points=3<br>Point Spacing=2.414<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=85.759<br>Angle Between Sides=<br>Center Pattern=true | | (1) |

## Fixed Targets

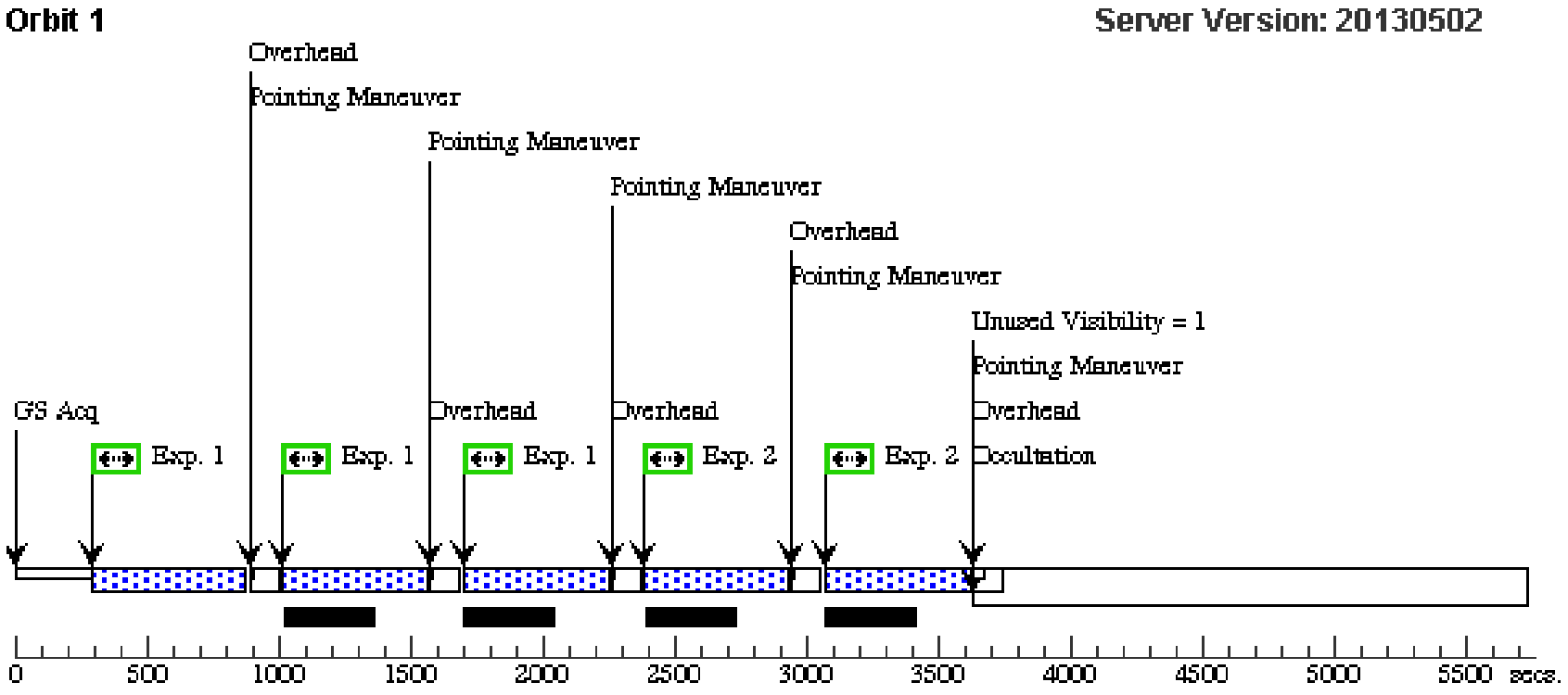
| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | 1E-0102.2-7219 | RA: 01 04 1.9600 (16.0081667d)<br>Dec: -72 01 53.73 (-72.03159d)<br>Equinox: J2000 | | V=17+/-1 | Reference Frame: SIMBAD |

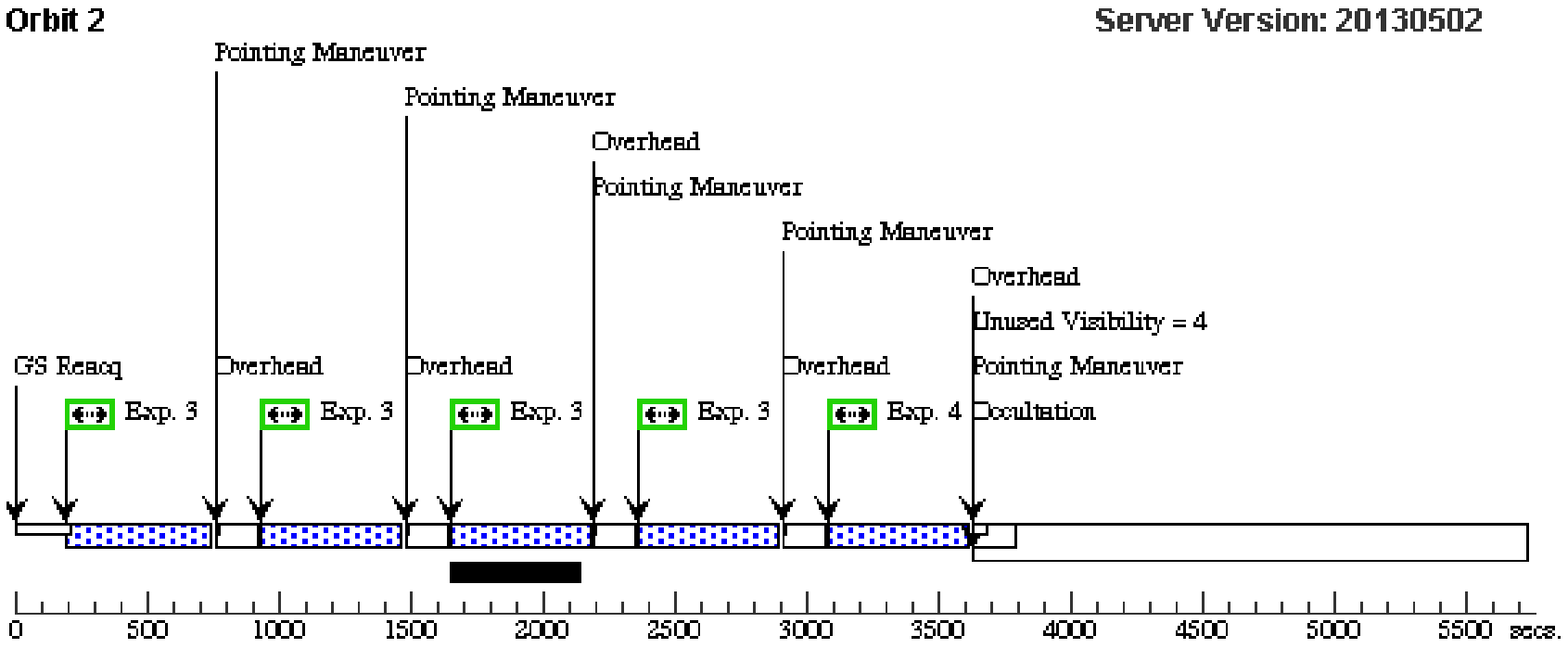
*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*

**Exposures**

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F502N | FLASH=11 | POS TARG null,-4.77 | Pattern 8, Exps 1-1 in Visit 02 (8) | 551 Secs (1653 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 2 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F502N | FLASH=11 | POS TARG 0.5,-4.77 | Pattern 7, Exps 2-2 in Visit 02 (7) | 550 Secs (1100 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]* | ***[1]*** |
| 3 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-QUAD-SUB | FQ492N | FLASH=11 | | Pattern 6, Exps 3-3 in Visit 02 (6) | 533 Secs (2132 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]*<br>*[==>(Pattern 4)]* | ***[2]*** |
| 4 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-QUAD-SUB | FQ492N | FLASH=11 | POS TARG 0.12,-0.1 | | 533 Secs (533 Secs)<br>*[==>]* | ***[2]*** |
| 5 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-QUAD-SUB | FQ508N | FLASH=11 | | Pattern 6, Exps 5-5 in Visit 02 (6) | 533 Secs (2132 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]*<br>*[==>(Pattern 4)]* | ***[3]*** |
| 6 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-QUAD-SUB | FQ508N | FLASH=11 | POS TARG 0.12,-0.1 | | 533 Secs (533 Secs)<br>*[==>]* | ***[3]*** |

Orbit Structure




Orbit 2
Server Version: 20130502
Pointing Maneuver
Pointing Maneuver
Overhead
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Overhead
Unused Visibility = 4
GS Reacq
Overhead
Overhead
Overhead
Pointing Maneuver
Exp. 3
Exp. 3
Exp. 3
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2000
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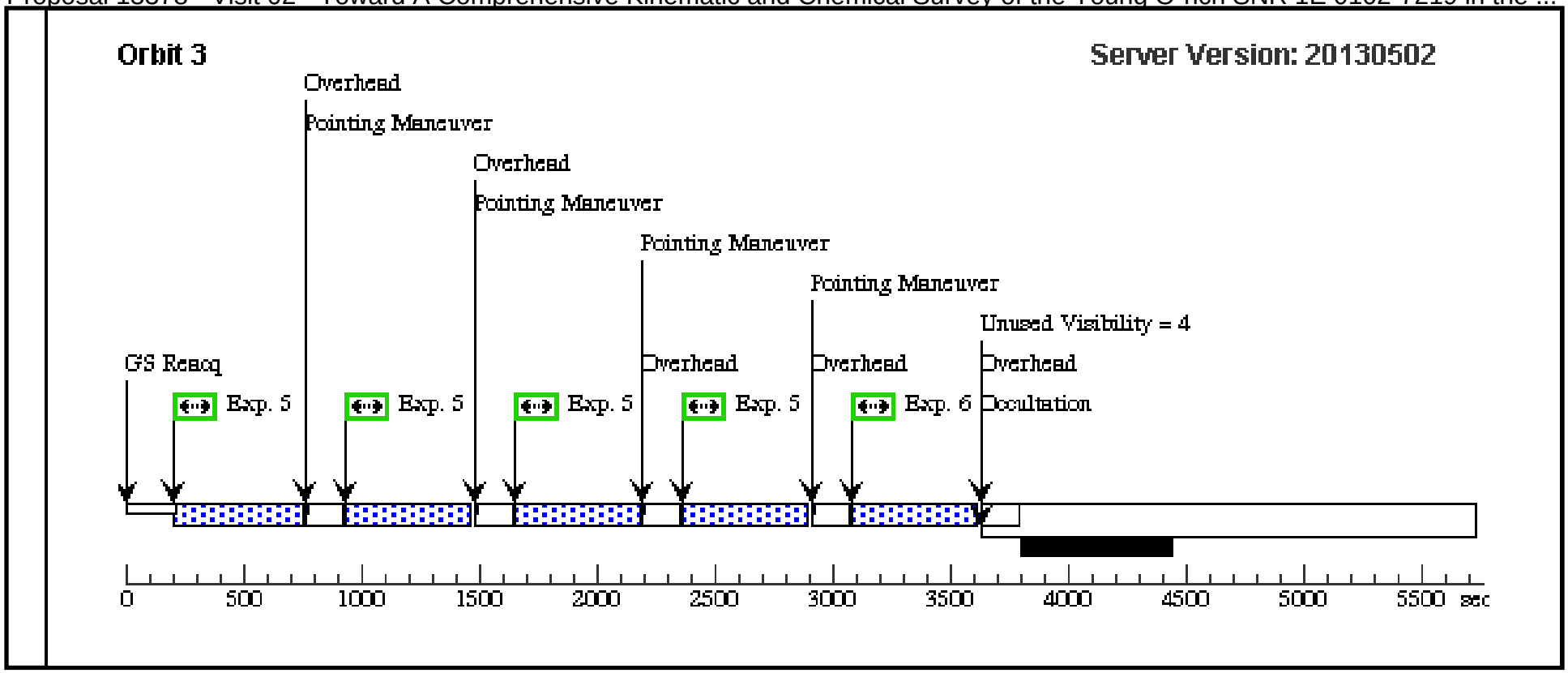
3000
3500
4000
4500
5000
5500
secs.


Orbit 3
Server Version: 20130502
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 4
GS Reacq
Exp. 5
Exp. 5
Exp. 5
Overhead
Exp. 5
Overhead
Exp. 6
Overhead
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

## Visit

**Proposal 13378, Visit 03** Thu Jul 11 22:09:17 GMT 2013

**Diagnostic Status: Warning**

Scientific Instruments: WFC3/UVIS

Special Requirements: SAME ORIENT AS 01

## Diagnostics

(Exposure 1 (Pattern 8, Exps 1-1 in Visit 03) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

(Exposure 2 (Pattern 7, Exps 2-2 in Visit 03) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

(Exposure 3 (Pattern 8, Exps 3-3 in Visit 03) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

(Exposure 4 (Pattern 7, Exps 4-4 in Visit 03) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

(Exposure 5 (Pattern 8, Exps 5-5 in Visit 03) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

(Exposure 6 (Pattern 7, Exps 6-6 in Visit 03) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

(Exposure 7 (Pattern 8, Exps 7-7 in Visit 03) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

(Exposure 8 (Pattern 8, Exps 8-8 in Visit 03) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes

## Patterns

| # | Primary Pattern | | Secondary Pattern | Exposures |
|---|---|---|---|---|
| (7) | Pattern Type=WFC3-UVIS-GAP-LINE | Coordinate Frame=POS-TARG | | (2), (4), (6) |
| | Purpose=MOSAIC | Pattern Orientation=85.759 | | |
| | Number Of Points=2 | Angle Between Sides= | | |
| | Point Spacing=2.414 | Center Pattern=true | | |
| | Line Spacing= | | | |
| (8) | Pattern Type=WFC3-UVIS-GAP-LINE | Coordinate Frame=POS-TARG | | (1), (3), (5), (7), (8) |
| | Purpose=MOSAIC | Pattern Orientation=85.759 | | |
| | Number Of Points=3 | Angle Between Sides= | | |
| | Point Spacing=2.414 | Center Pattern=true | | |
| | Line Spacing= | | | |

## Fixed Targets

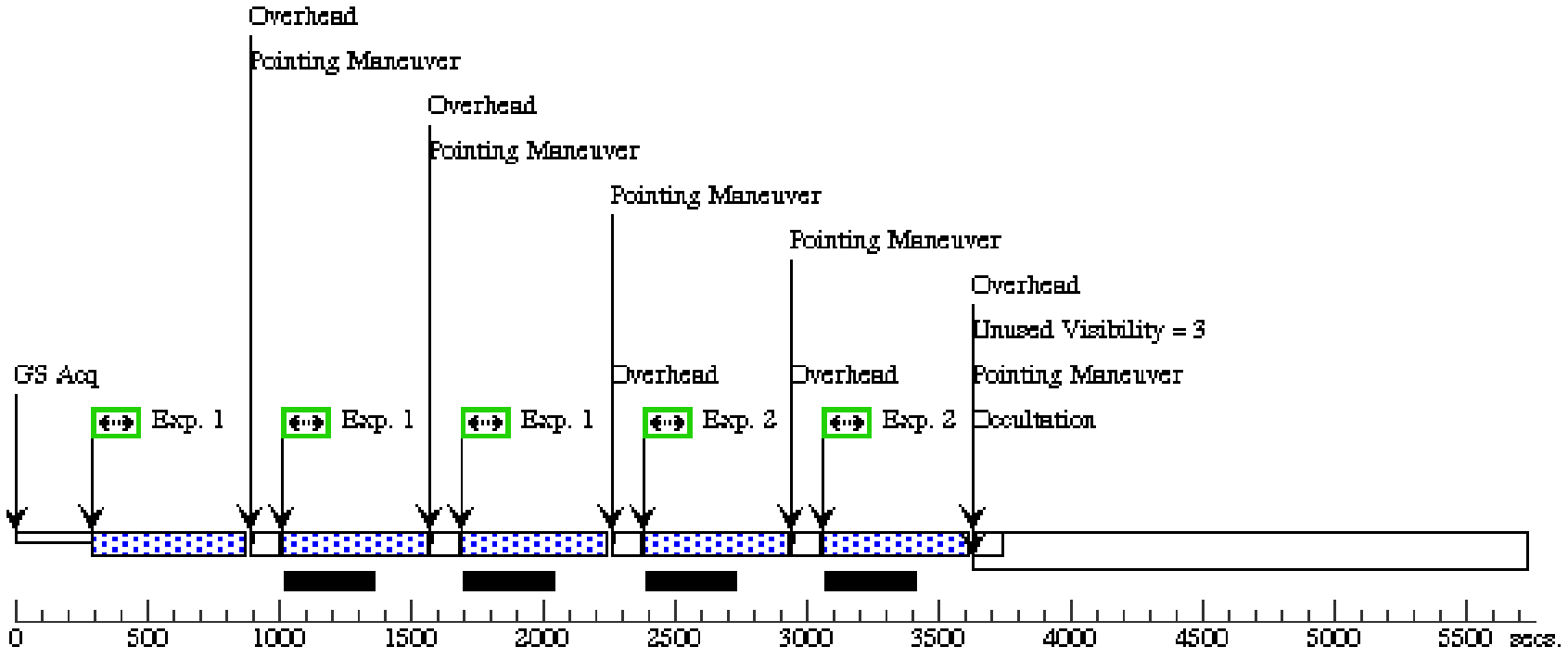
| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | 1E-0102.2-7219 | RA: 01 04 1.9600 (16.0081667d) | | V=17+/-1 | Reference Frame: SIMBAD |
| | | Dec: -72 01 53.73 (-72.03159d) | | | |
| | | Equinox: J2000 | | | |

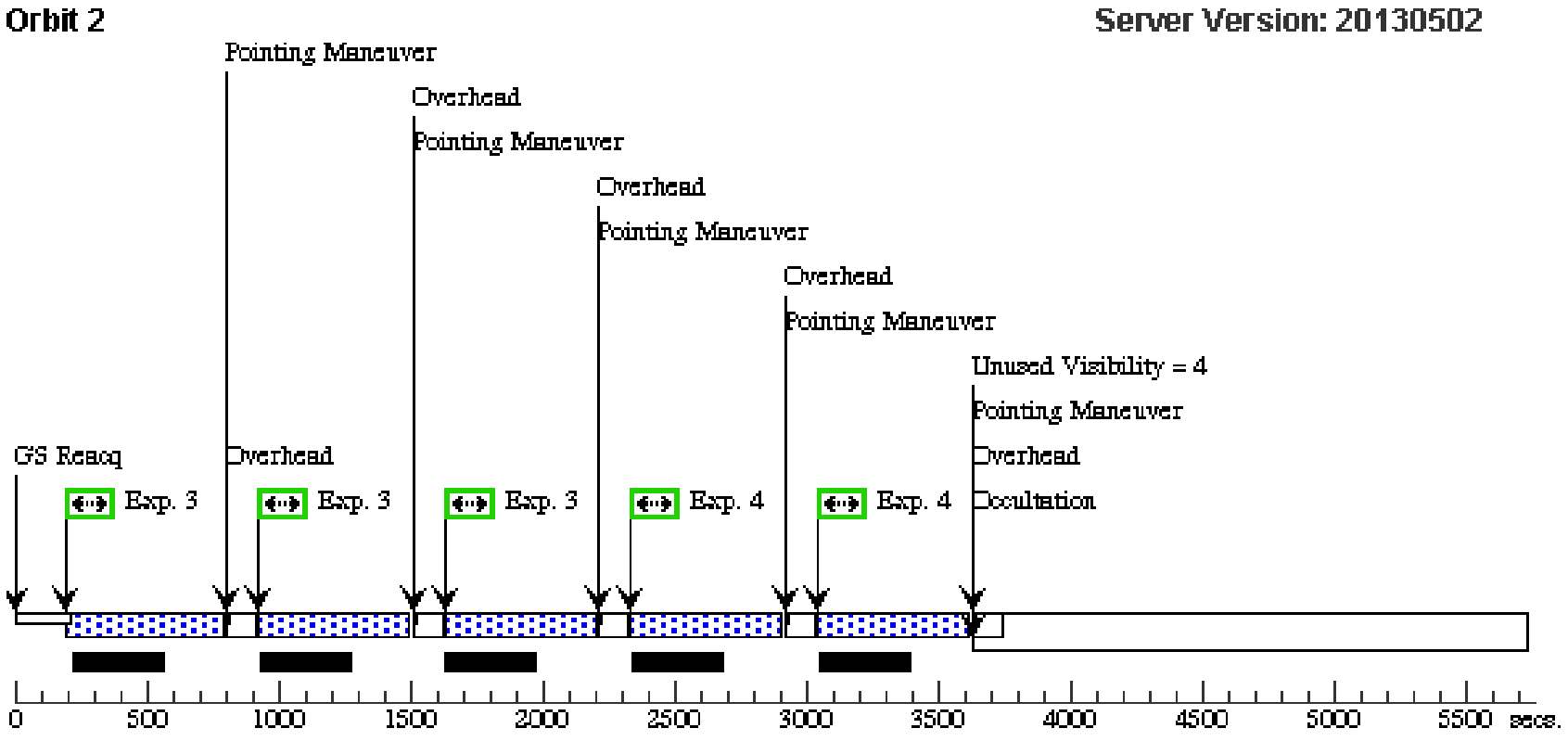
*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*

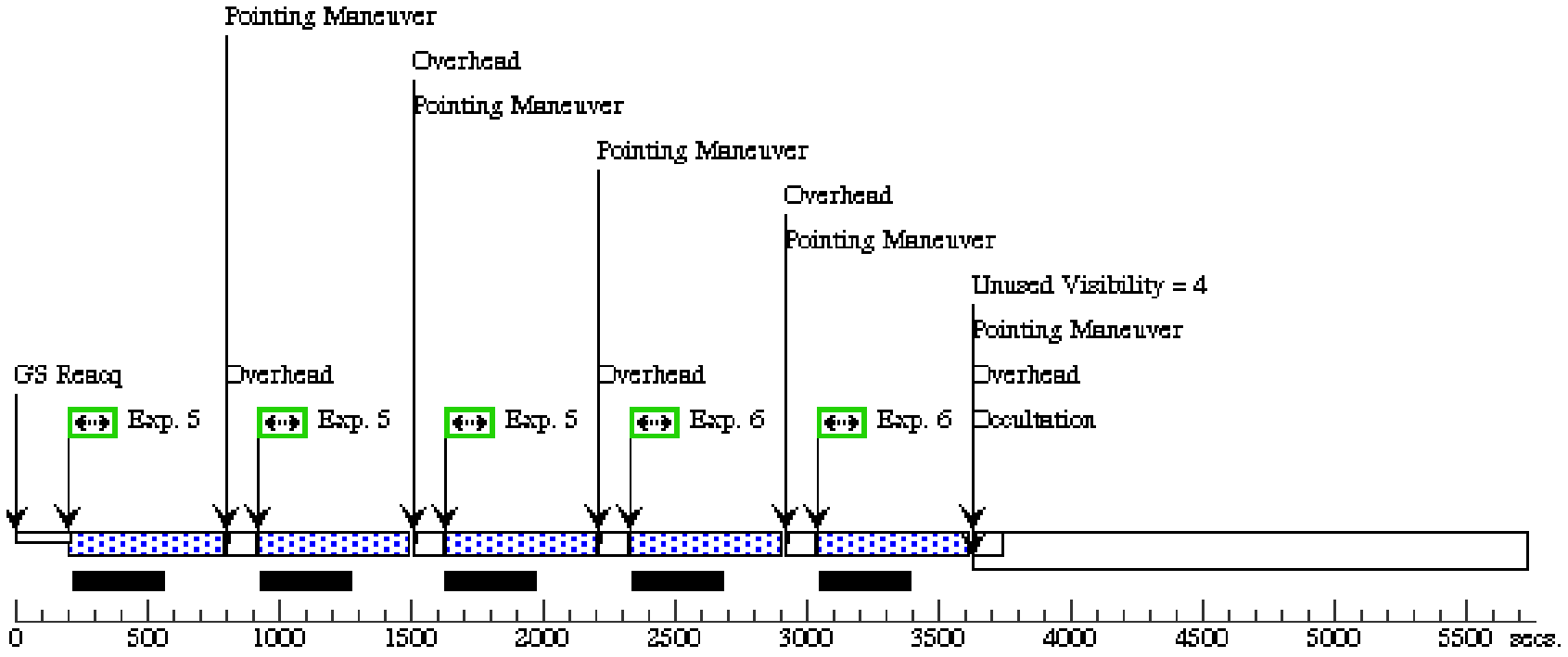
**Exposures**

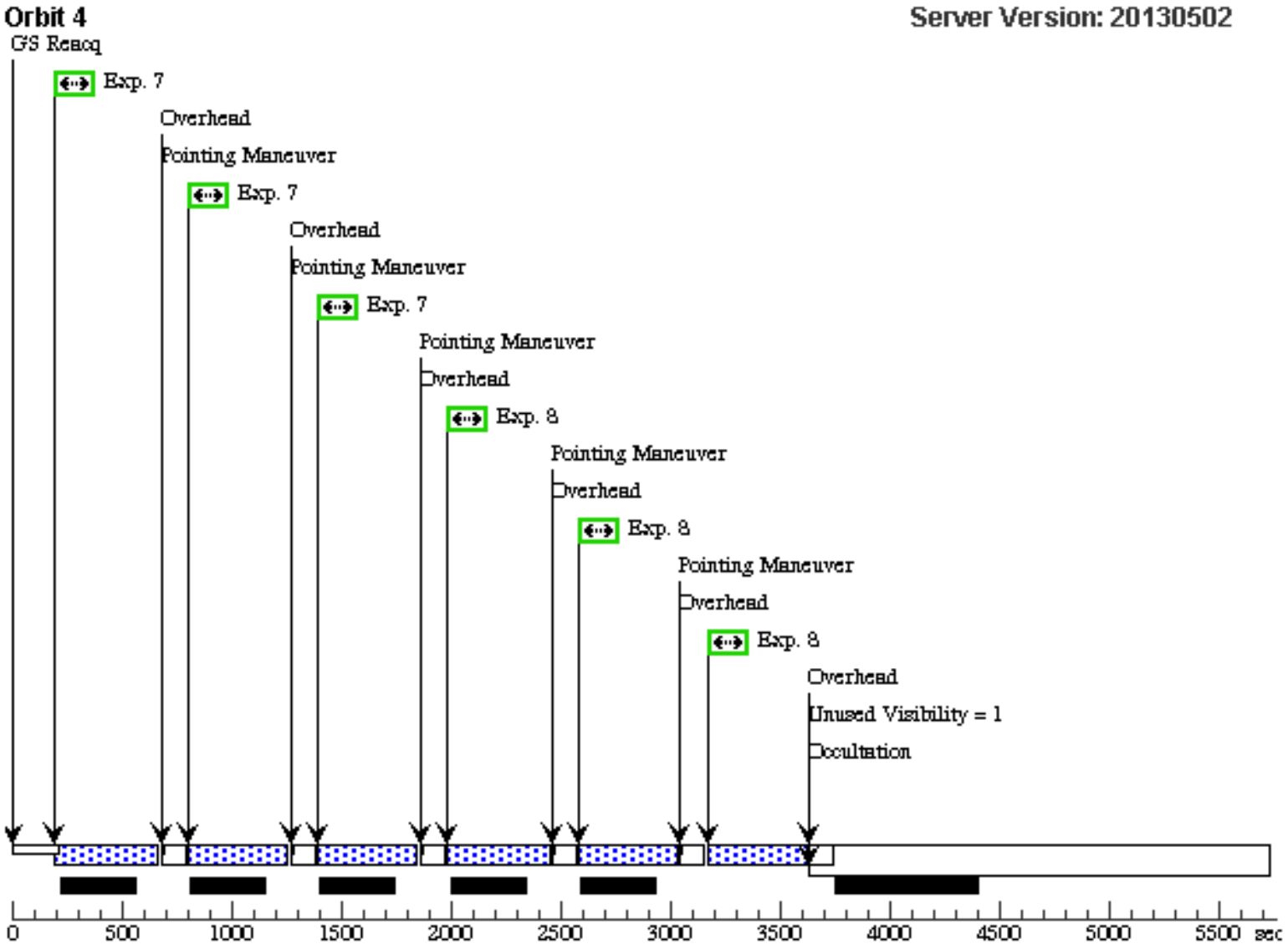
| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F657N | FLASH=10 | POS TARG null,-4.77 | Pattern 8, Exps 1-1 in Visit 03 (8) | 551 Secs (1653 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 2 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F657N | FLASH=10 | POS TARG 0.5,-4.77 | Pattern 7, Exps 2-2 in Visit 03 (7) | 551 Secs (1102 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]* | ***[1]*** |
| 3 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F665N | FLASH=10 | POS TARG null,-4.77 | Pattern 8, Exps 3-3 in Visit 03 (8) | 573 Secs (1719 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |
| 4 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F665N | FLASH=10 | POS TARG 0.5,-4.77 | Pattern 7, Exps 4-4 in Visit 03 (7) | 573 Secs (1146 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]* | ***[2]*** |
| 5 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F673N | FLASH=10 | POS TARG null,-4.77 | Pattern 8, Exps 5-5 in Visit 03 (8) | 573 Secs (1719 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[3]*** |
| 6 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F673N | FLASH=10 | POS TARG 0.5,-4.77 | Pattern 7, Exps 6-6 in Visit 03 (7) | 573 Secs (1146 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]* | ***[3]*** |
| 7 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F467M | FLASH=10 | POS TARG null,-4.77 | Pattern 8, Exps 7-7 in Visit 03 (8) | 454 Secs (1362 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[4]*** |
| 8 | | (1) 1E-0102.2-7219 | WFC3/UVIS, ACCUM, UVIS-CENTER | F645N | FLASH=11 | POS TARG null,-4.77 | Pattern 8, Exps 8-8 in Visit 03 (8) | 450 Secs (1350 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[4]*** |

Orbit Structure




Orbit 2
Server Version: 20130502
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Unused Visibility = 4
Pointing Maneuver
Overhead
Occultation
GS Reacq
Overhead
Exp. 3
Exp. 3
Exp. 3
Exp. 4
Exp. 4
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.


Orbit 3
Server Version: 20130502
Pointing Maneuver
Overhead
Pointing Maneuver
Pointing Maneuver
Overhead
Pointing Maneuver
Unused Visibility = 4
Pointing Maneuver
GS Reacq
Overhead
Overhead
Overhead
Occultation
Exp. 5
Exp. 5
Exp. 5
Exp. 6
Exp. 6
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.


Orbit 4
Server Version: 20130502
GS Reacq
Exp. 7
Overhead
Pointing Maneuver
Exp. 7
Overhead
Pointing Maneuver
Exp. 7
Pointing Maneuver
Overhead
Exp. 8
Pointing Maneuver
Overhead
Exp. 8
Pointing Maneuver
Overhead
Exp. 8
Overhead
Unused Visibility = 1
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec