# 15069 - The ages and baryonic masses of clumps in turbulent, clumpy disk galaxies

Cycle: 25, Proposal Category: GO

(Availability Mode: SUPPORTED)

**INVESTIGATORS**



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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) G04-1 | WFC3/IR<br>WFC3/UVIS | 2 | 20-Jul-2017 15:02:14.0 | yes |
| 02 | (2) G20-2 | WFC3/IR<br>WFC3/UVIS | 2 | 20-Jul-2017 15:02:16.0 | yes |
| 03 | (3) D13-5 | WFC3/IR<br>WFC3/UVIS | 2 | 20-Jul-2017 15:02:18.0 | yes |
| 04 | (4) G08-5 | WFC3/IR<br>WFC3/UVIS | 2 | 20-Jul-2017 15:02:20.0 | yes |
| 05 | (5) G14-1 | WFC3/IR<br>WFC3/UVIS | 2 | 20-Jul-2017 15:02:21.0 | yes |

| *Visit* | *Targets used in Visit* | *Configurations used in Visit* | *Orbits Used* | *Last Orbit Planner Run* | *OP Current with Visit?* |
|---|---|---|---|---|---|
| 06 | (6) D15-3 | WFC3/IR<br>WFC3/UVIS | 2 | 20-Jul-2017 15:02:23.0 | yes |

12 Total Orbits Used

**ABSTRACT**

We propose to measure the stellar populations and masses of massive star forming clumps at the resolution of the Jeans' length in a sample of massive, turbulent disk galaxies. Massive star-forming clumps are a critical component of the morphogical transformation of galaxies and the build-up of bulges. If, however, clumps dissipate quickly  bulges may not form through clump phase, then clumps would build thick disks. Different feedback prescriptions have drastically different effects on clumps. Some feedback models (e.g. Hopkins et al 2012, FIRE simulations) completely destroy clumps whereas other feedback models allow clumps to persist (e.g. Bournaud et al. 2014). Therefore, to build accurate models of galaxy evolution we must know how long the lives of clumps are.  The problem is that both due to resolution and available wavelength coverage it is impossible to precisely measure the ages and stellar masses of individual clumps in high-z galaxies. We have discovered a sample of extremely rare galaxies at z~0.1 that are extremely gas rich, turbulent and have a clumpy distribution of ionized gas. In all ways they are identical to those of the high-redshift Universe.  We propose to employ UV-optical-near IR imaging with WFC3 to measure the stellar masses and mean ages of a set of 6 clumpy galaxies, containing ~80 giant star forming clumps. This data complements our ALMA CO(1-0) maps of the same targets, and we will thus make the first maps of the full baryonic mass in turbulent disk galaxies. This work builds on our previous HST Halpha imaging program, and validates massive investments of HST time on high-z surveys of galaxies.

**OBSERVING DESCRIPTION**

The aim of this proposal is to measure stellar populations and stellar masses in star forming regions in a set of clumpy disk galaxies at z=0.1. To this end we will make WFC3/UVIS observations of F225W, F336W and F467M. To constrain stellar masses we use WFC3/IR F125W. Because we expect very young stellar populations, we are focusing most of our observations toward UV (F225W) and U (F336W) observations. The total award of time is 12 orbits for 6 targets.

For all WFC3/UVIS observations we employ a FLASH to mitigate CTE effects. The FLASH is set to give a total background count of 12e. For all targets we employ a 3-point line dither pattern. The aim of this dither is to mitigate affects from cosmic rays. Our targets are relatively small (diameter <~ 10 arcsec). We therefore use the UVIS2-M1K1C subarrary for all UVIS observations, and the IRSUB256 subarray for IR observations.

Using these subarrays allows for a very significant increase in exposure times (due to reduced overheads) without sacrificing any of our science goals.

Because we are studying ages of substructure in galaxies there is some uncertainty in the signal-to-noise calculation. We do not know a priori what the template spectrum will be. We based S/N estimates on the 1 Gyr Bruzual-Charlot populations with Av~1 and redshifted to z=0.13. Based on previous observations of Halpha with ACS/WFC we assumed that a typical region of interest will be ~1% of the light in an 0.2 arcsec region. Our targets are V~17, so this means a reference magnitude of V~22 for the S/N calculations. If the ages skew to younger populations (as we expect) then this will increase S/N in the UV channels and slightly decrease S/N in F125W.

For filters F225W, F336W, F467M and F125W we calculate that exposure times of 2310, 1800, 540, and 201 return expected S/N of 18, 44, 20 and 109 The higher S/N in F125W will be useful if star forming regions are less pronounced in J-band, which is plausible. For the IR observations we use SAMP-SEQ=SPARS25 and SAMP=4.

## Visit

**Proposal 15069, G04-1 (01)** Thu Jul 20 19:02:24 GMT 2017

**Diagnostic Status: No Diagnostics**

Scientific Instruments: WFC3/IR, WFC3/UVIS

Special Requirements: (none)

## Patterns

| # | Primary Pattern | | Secondary Pattern | Exposures |
|---|---|---|---|---|
| (1) | Pattern Type=WFC3-UVIS-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.135<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=46.84<br>Angle Between Sides=<br>Center Pattern=false | | (1), (2), (3) |
| (2) | Pattern Type=WFC3-IR-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.605<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=41.788<br>Angle Between Sides=<br>Center Pattern=false | | (4) |

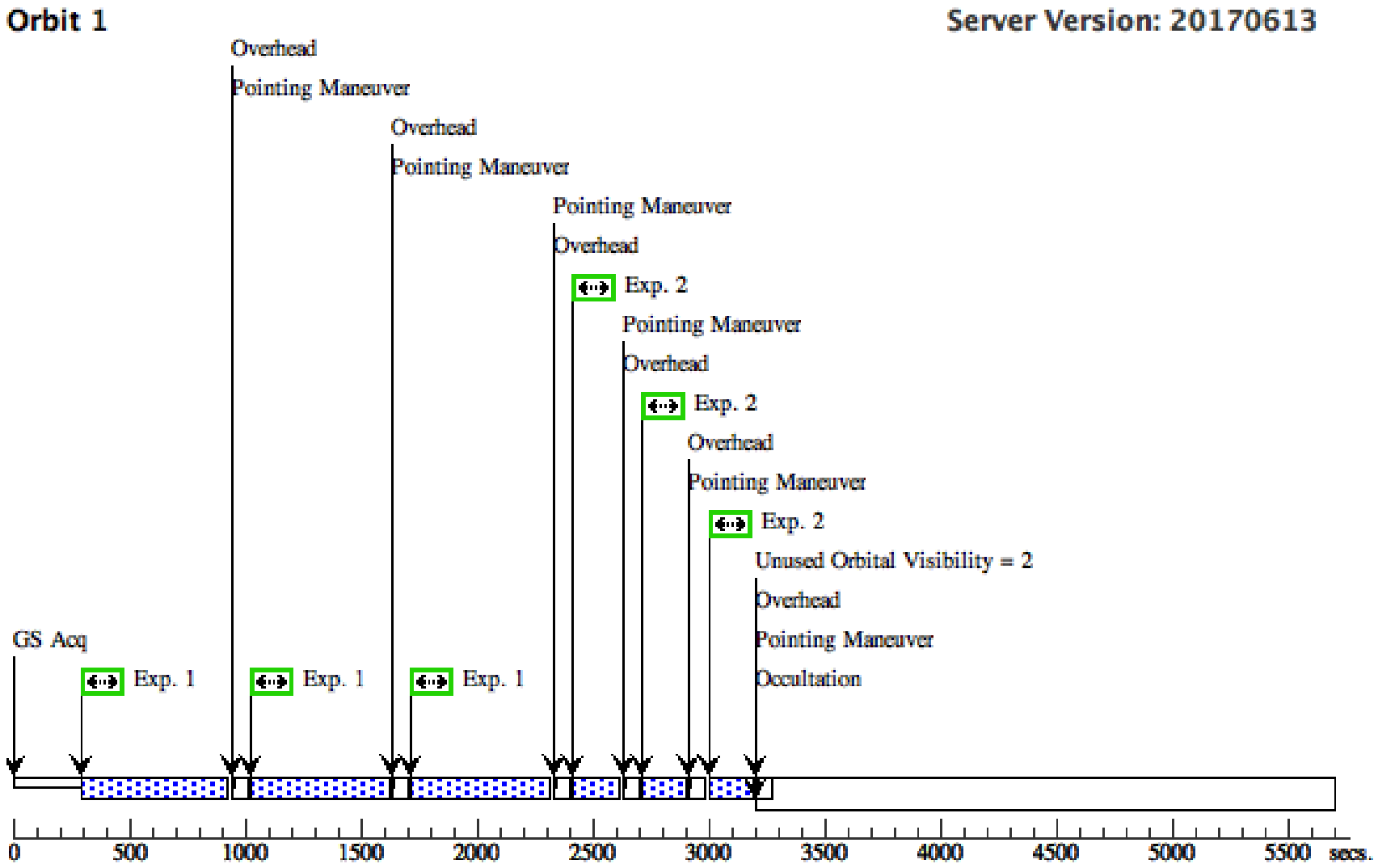
## Fixed Targets

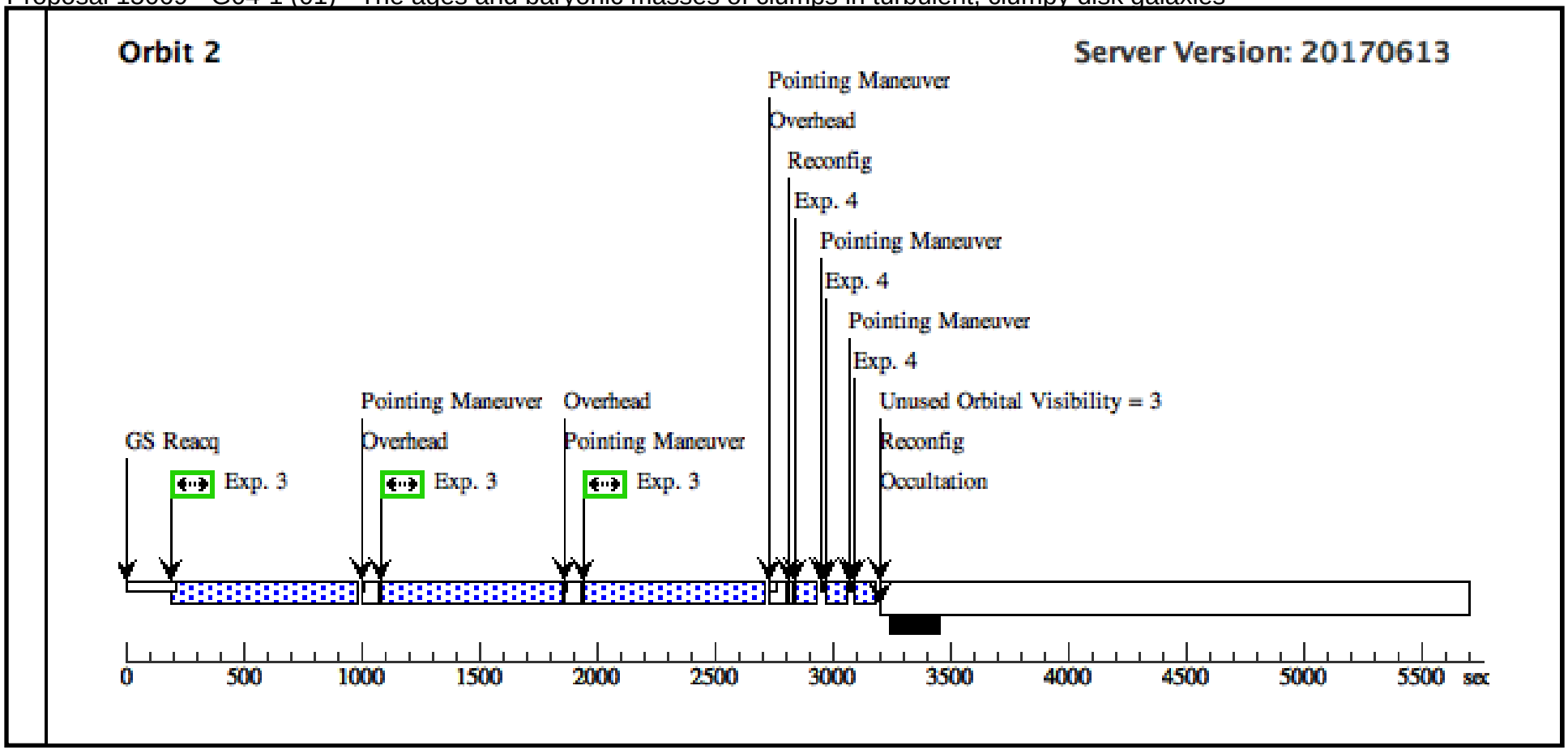
| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | G04-1 | RA: 04 12 19.7100 (63.0821250d)<br>Dec: -05 54 48.60 (-5.91350d)<br>Equinox: J2000 | | V=17.8+/-.3 | Reference Frame: ICRS |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (1) G04-1 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F336W | FLASH=10 | | Pattern 1, Exps 1-1 in G04-1 (01) (1) | 600 Secs (1800 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 2 | | (1) G04-1 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F467M | FLASH=11 | | Pattern 1, Exps 2-2 in G04-1 (01) (1) | 186 Secs (558 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 3 | | (1) G04-1 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F225W | FLASH=9 | | Pattern 1, Exps 3-3 in G04-1 (01) (1) | 770 Secs (2310 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |
| 4 | | (1) G04-1 | WFC3/IR, MULTIACCUM, IRSUB256 | F125W | SAMP-SEQ=SPARS25;<br>NSAMP=4 | | Pattern 2, Exps 4-4 in G04-1 (01) (2) | 67.315932 Secs (201.948 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |

Orbit Structure




Orbit 2
Server Version: 20170613
Pointing Maneuver
Overhead
Reconfig
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Unused Orbital Visibility = 3
Reconfig
Occultation
Pointing Maneuver
Overhead
Exp. 3
Overhead
Pointing Maneuver
Exp. 3
GS Reacq
Exp. 3
0
500
1000
1500
2000
2500
3000
3500
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4500
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5500
sec

## Visit

**Proposal 15069, G20-2 (02)** Thu Jul 20 19:02:25 GMT 2017

**Diagnostic Status: No Diagnostics**

Scientific Instruments: WFC3/IR, WFC3/UVIS

Special Requirements: (none)

## Patterns

| # | Primary Pattern | | Secondary Pattern | Exposures |
|---|---|---|---|---|
| (1) | Pattern Type=WFC3-UVIS-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.135<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=46.84<br>Angle Between Sides=<br>Center Pattern=false | | (1), (2), (3) |
| (2) | Pattern Type=WFC3-IR-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.605<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=41.788<br>Angle Between Sides=<br>Center Pattern=false | | (4) |

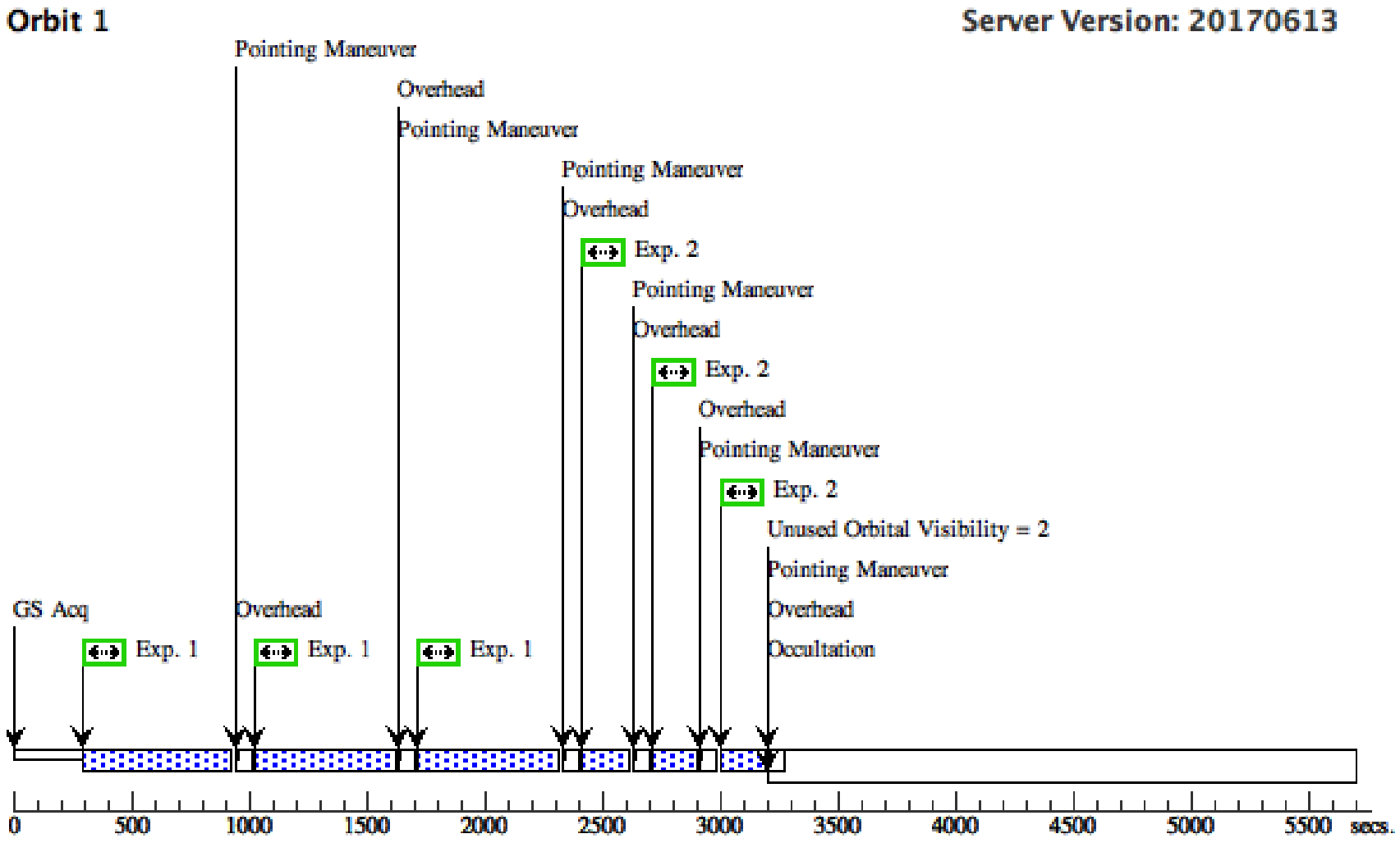
## Fixed Targets

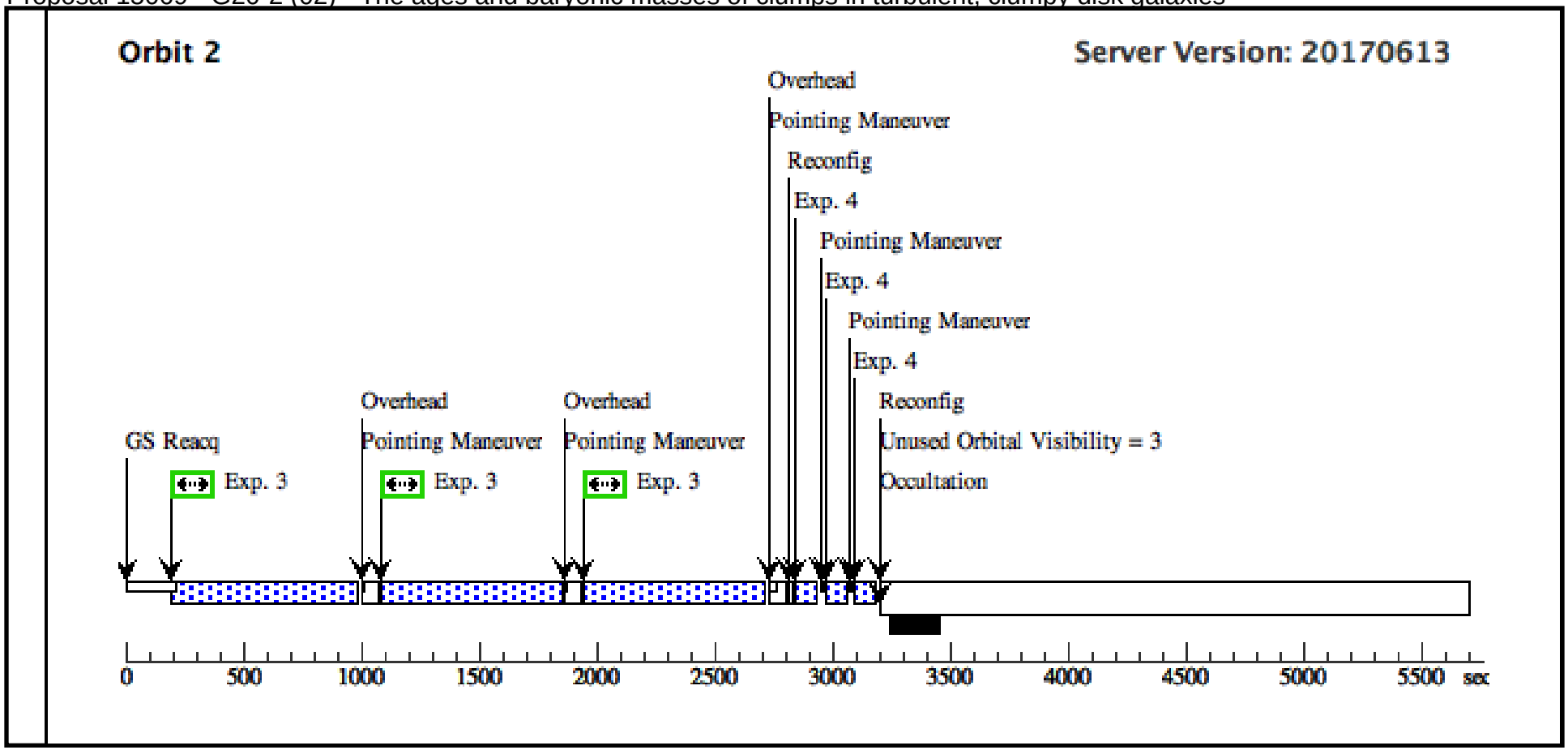
| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (2) | G20-2 | RA: 20 44 2.9150 (311.0121458d)<br>Dec: -06 46 57.90 (-6.78275d)<br>Equinox: J2000 | | V=17.7+/-.3 | Reference Frame: ICRS |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (2) G20-2 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F336W | FLASH=10 | | Pattern 1, Exps 1-1 in G20-2 (02) (1) | 600 Secs (1800 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 2 | | (2) G20-2 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F467M | FLASH=11 | | Pattern 1, Exps 2-2 in G20-2 (02) (1) | 186 Secs (558 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 3 | | (2) G20-2 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F225W | FLASH=9 | | Pattern 1, Exps 3-3 in G20-2 (02) (1) | 770 Secs (2310 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |
| 4 | | (2) G20-2 | WFC3/IR, MULTIACCUM, IRSUB256 | F125W | SAMP-SEQ=SPARS25;<br>NSAMP=4 | | Pattern 2, Exps 4-4 in G20-2 (02) (2) | 67.315932 Secs (201.948 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |

Orbit Structure




Orbit 2
Server Version: 20170613
GS Reacq
Exp. 3
Overhead
Pointing Maneuver
Exp. 3
Overhead
Pointing Maneuver
Exp. 3
Overhead
Pointing Maneuver
Reconfig
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Reconfig
Unused Orbital Visibility = 3
Occultation
0
500
1000
1500
2000
2500
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3500
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5500
sec

## Visit

**Proposal 15069, D13-5 (03)** Thu Jul 20 19:02:25 GMT 2017

**Diagnostic Status: No Diagnostics**

Scientific Instruments: WFC3/IR, WFC3/UVIS

Special Requirements: (none)

## Patterns

| # | Primary Pattern | | Secondary Pattern | Exposures |
|---|---|---|---|---|
| (1) | Pattern Type=WFC3-UVIS-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.135<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=46.84<br>Angle Between Sides=<br>Center Pattern=false | | (1), (2), (3) |
| (2) | Pattern Type=WFC3-IR-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.605<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=41.788<br>Angle Between Sides=<br>Center Pattern=false | | (4) |

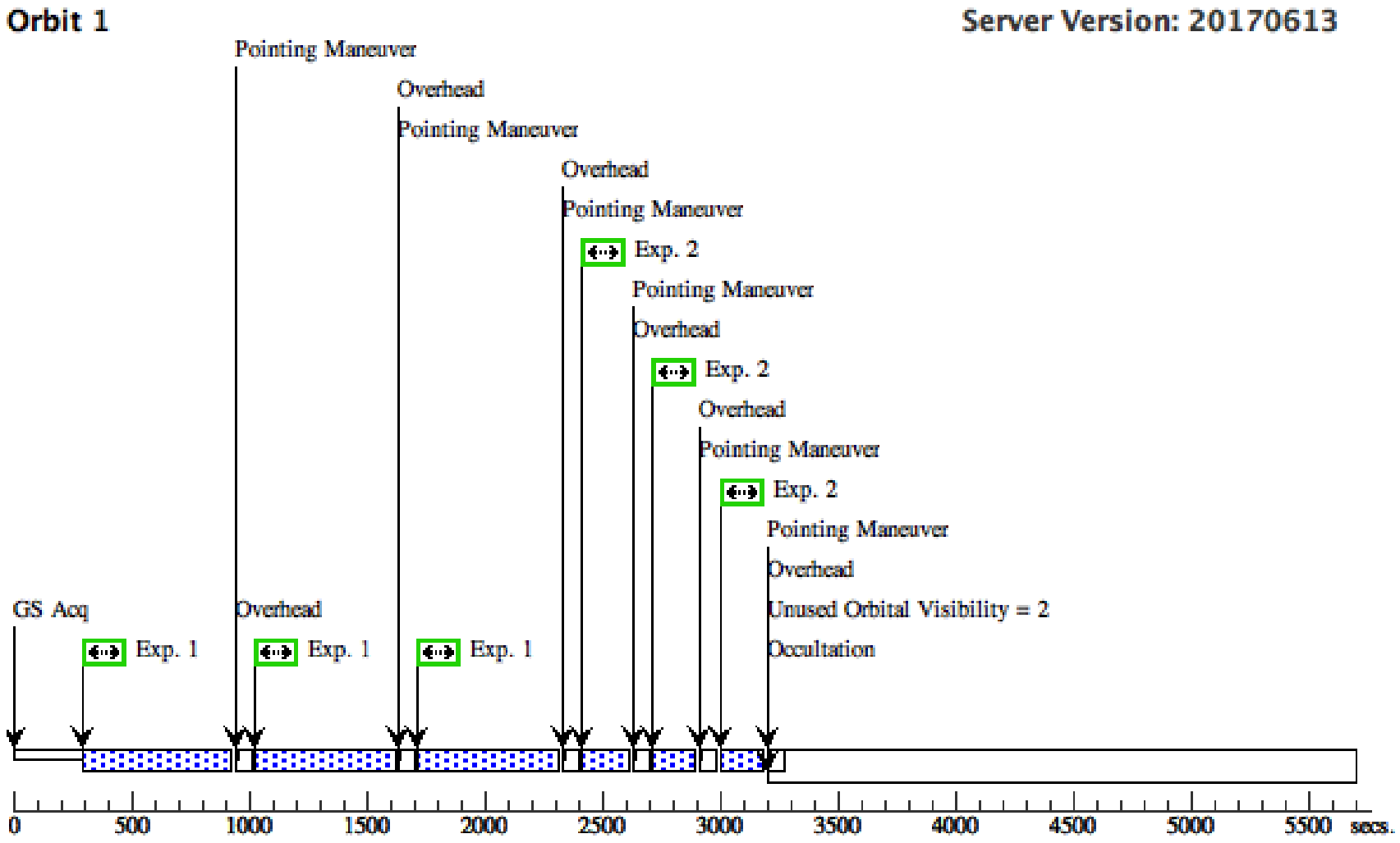
## Fixed Targets

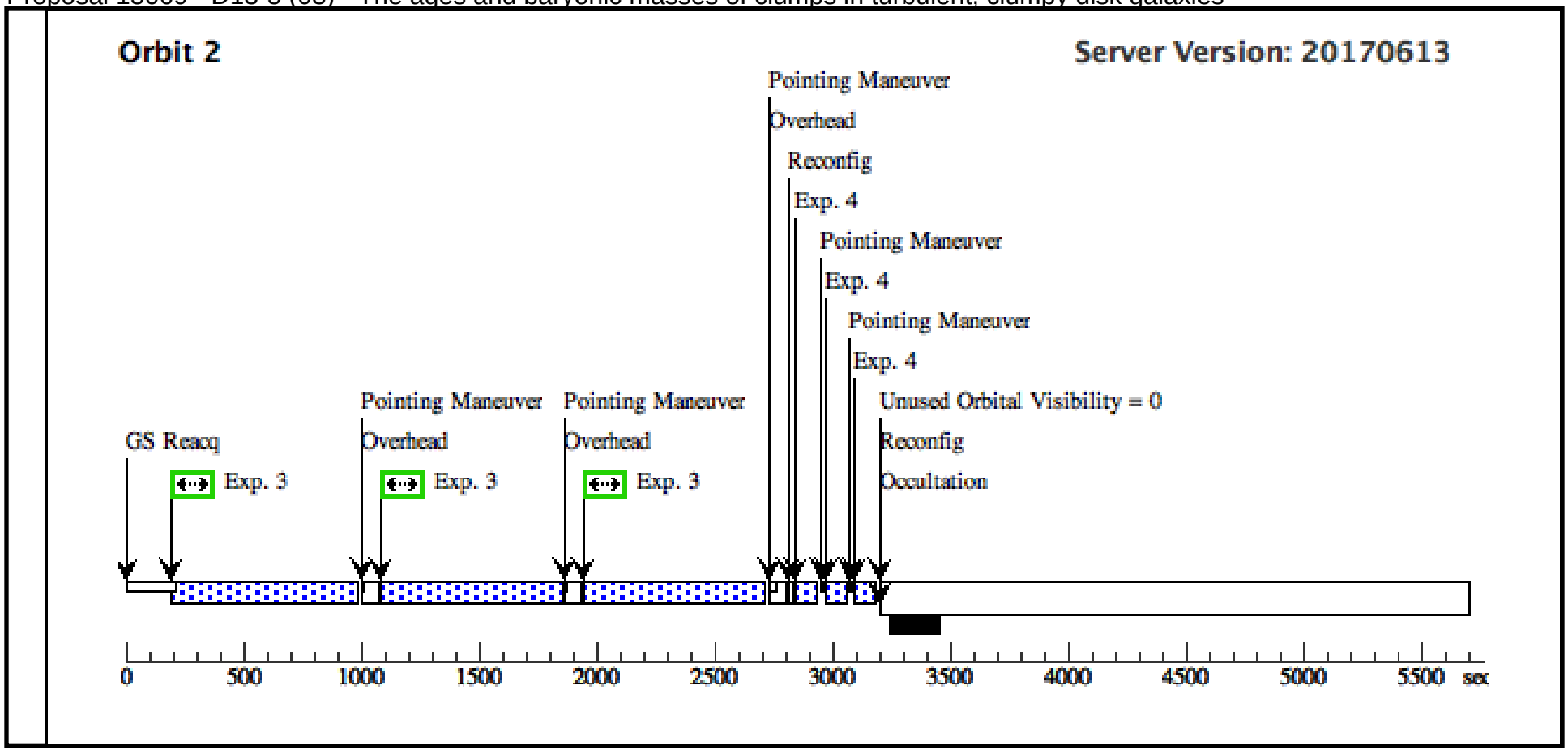
| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (3) | D13-5 | RA: 13 30 7.0050 (202.5291875d)<br>Dec: +00 31 53.30 (.53147d)<br>Equinox: J2000 | | V=16.6+/-.3 | Reference Frame: ICRS |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (3) D13-5 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F336W | FLASH=10 | | Pattern 1, Exps 1-1 in D13-5 (03) (1) | 600 Secs (1800 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 2 | | (3) D13-5 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F467M | FLASH=11 | | Pattern 1, Exps 2-2 in D13-5 (03) (1) | 185 Secs (555 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 3 | | (3) D13-5 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F225W | FLASH=9 | | Pattern 1, Exps 3-3 in D13-5 (03) (1) | 770 Secs (2310 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |
| 4 | | (3) D13-5 | WFC3/IR, MULTIACCUM, IRSUB256 | F125W | SAMP-SEQ=SPARS25;<br>NSAMP=4 | | Pattern 2, Exps 4-4 in D13-5 (03) (2) | 67.315932 Secs (201.948 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |

Orbit Structure




Orbit 2
Server Version: 20170613
Pointing Maneuver
Overhead
Reconfig
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Unused Orbital Visibility = 0
Reconfig
Occultation
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
GS Reacq
Exp. 3
Exp. 3
Exp. 3
0
500
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1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

## Visit

**Proposal 15069, G08-5 (04)** Thu Jul 20 19:02:25 GMT 2017

**Diagnostic Status: No Diagnostics**

Scientific Instruments: WFC3/IR, WFC3/UVIS

Special Requirements: (none)

## Patterns

| # | Primary Pattern | | Secondary Pattern | Exposures |
|---|---|---|---|---|
| (1) | Pattern Type=WFC3-UVIS-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.135<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=46.84<br>Angle Between Sides=<br>Center Pattern=false | | (1), (2), (3) |
| (2) | Pattern Type=WFC3-IR-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.605<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=41.788<br>Angle Between Sides=<br>Center Pattern=false | | (4) |

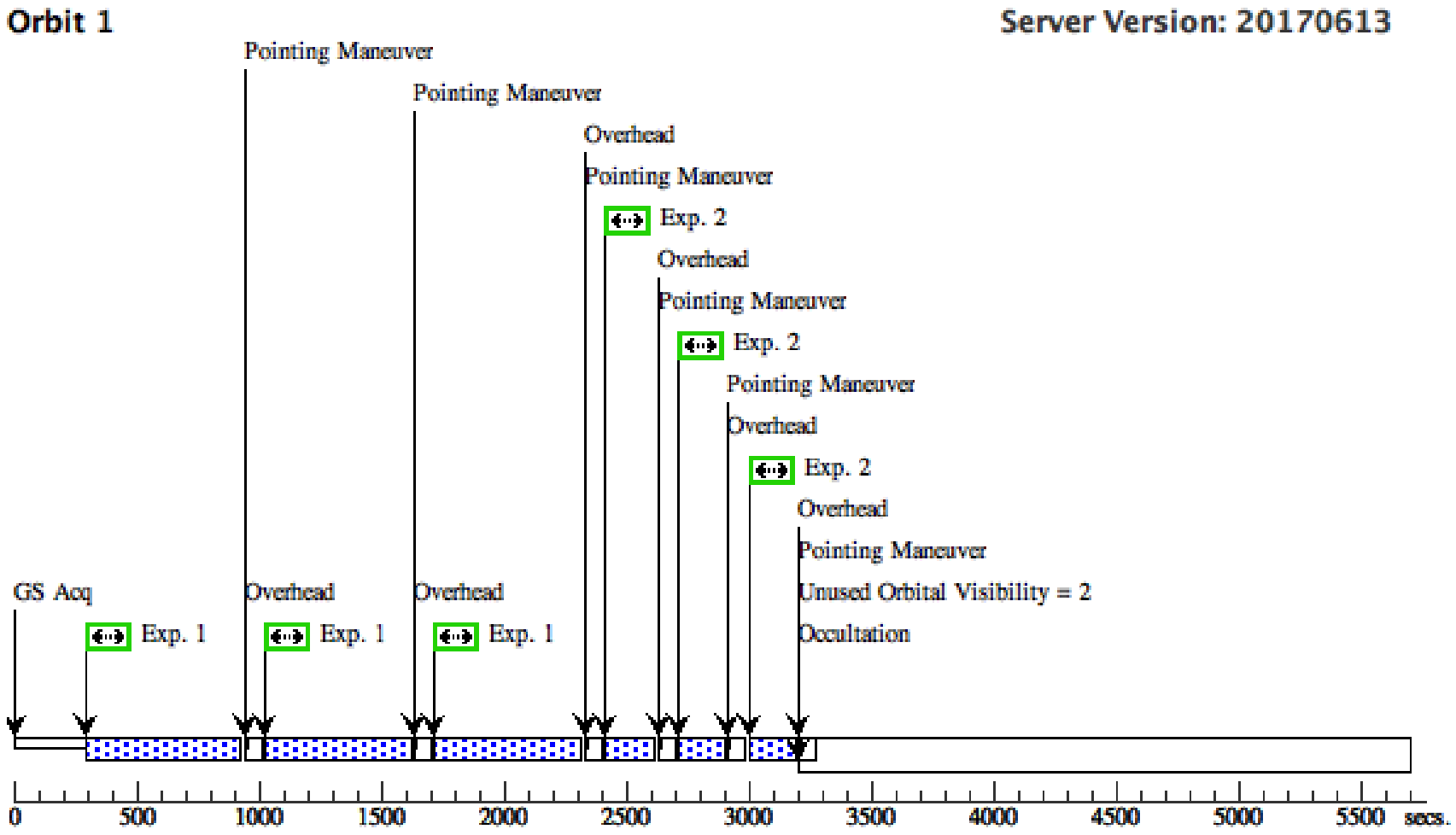
## Fixed Targets

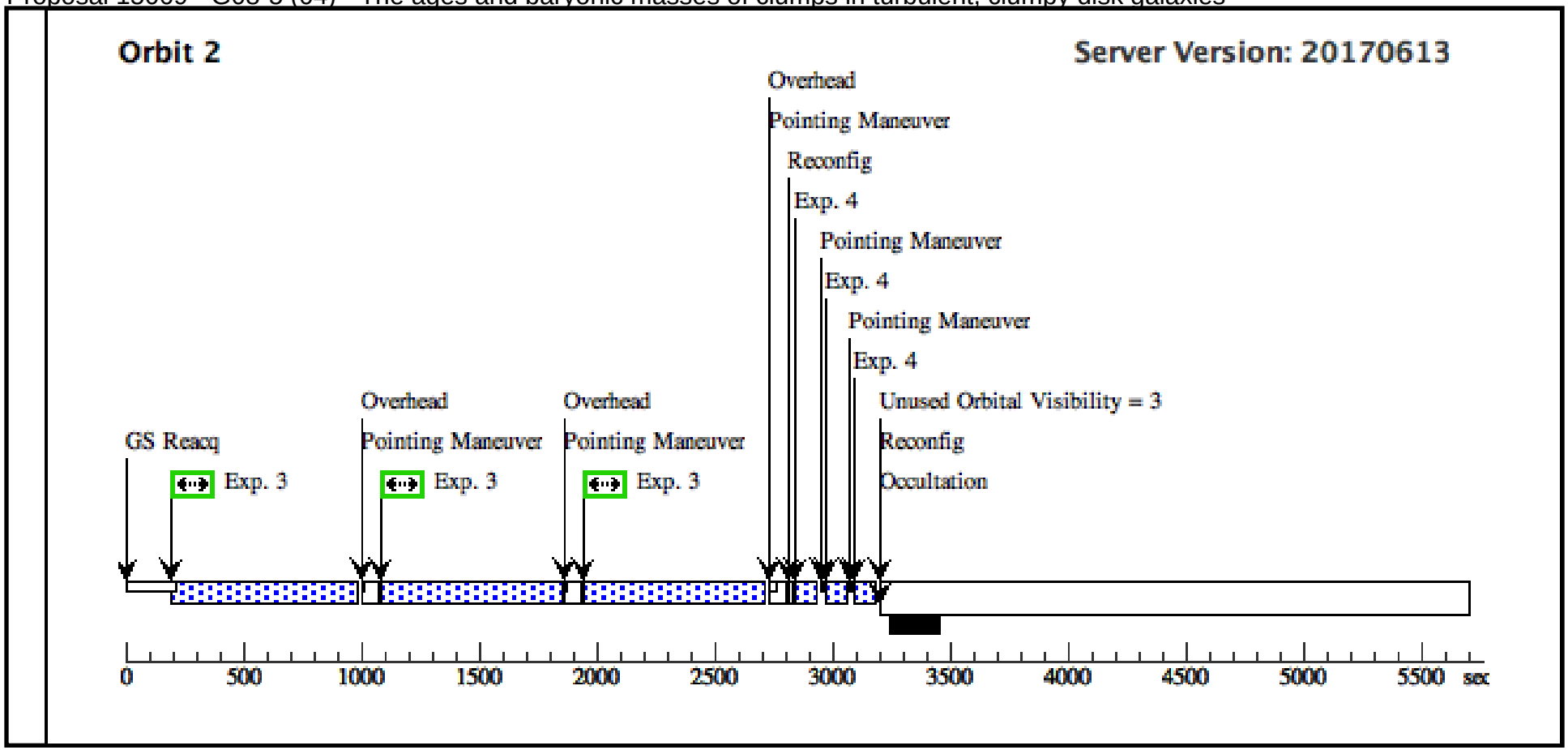
| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (4) | G08-5 | RA: 08 54 18.7300 (133.5780417d)<br>Dec: +06 46 20.60 (6.77239d)<br>Equinox: J2000 | | V=18.6+/-.3 | Reference Frame: ICRS |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (4) G08-5 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F336W | FLASH=10 | | Pattern 1, Exps 1-1 in G08-5 (04) (1) | 600 Secs (1800 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 2 | | (4) G08-5 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F467M | FLASH=11 | | Pattern 1, Exps 2-2 in G08-5 (04) (1) | 186 Secs (558 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 3 | | (4) G08-5 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F225W | FLASH=9 | | Pattern 1, Exps 3-3 in G08-5 (04) (1) | 770 Secs (2310 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |
| 4 | | (4) G08-5 | WFC3/IR, MULTIACCUM, IRSUB256 | F125W | SAMP-SEQ=SPARS25;<br>NSAMP=4 | | Pattern 2, Exps 4-4 in G08-5 (04) (2) | 67.315932 Secs (201.948 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |

Orbit Structure




Orbit 2
Server Version: 20170613
Overhead
Pointing Maneuver
Reconfig
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Unused Orbital Visibility = 3
Reconfig
Occultation
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
GS Reacq
Exp. 3
Exp. 3
Exp. 3
0
500
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4500
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5500
sec

## Visit

**Proposal 15069, G14-1 (05)** Thu Jul 20 19:02:25 GMT 2017

**Diagnostic Status: No Diagnostics**

Scientific Instruments: WFC3/IR, WFC3/UVIS

Special Requirements: (none)

## Patterns

| # | Primary Pattern | | Secondary Pattern | Exposures |
|---|---|---|---|---|
| (1) | Pattern Type=WFC3-UVIS-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.135<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=46.84<br>Angle Between Sides=<br>Center Pattern=false | | (1), (2), (3) |
| (2) | Pattern Type=WFC3-IR-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.605<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=41.788<br>Angle Between Sides=<br>Center Pattern=false | | (4) |

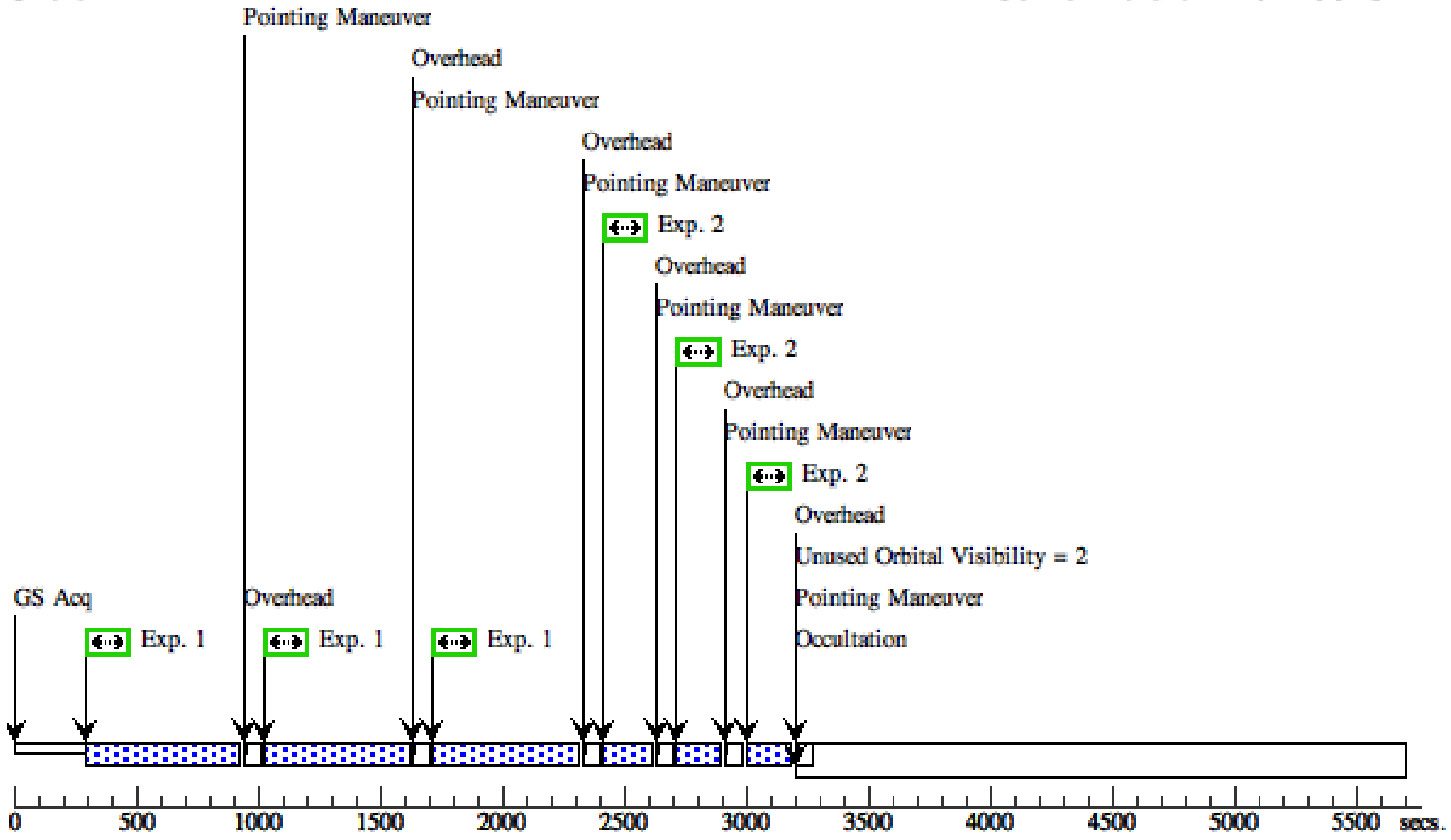
## Fixed Targets

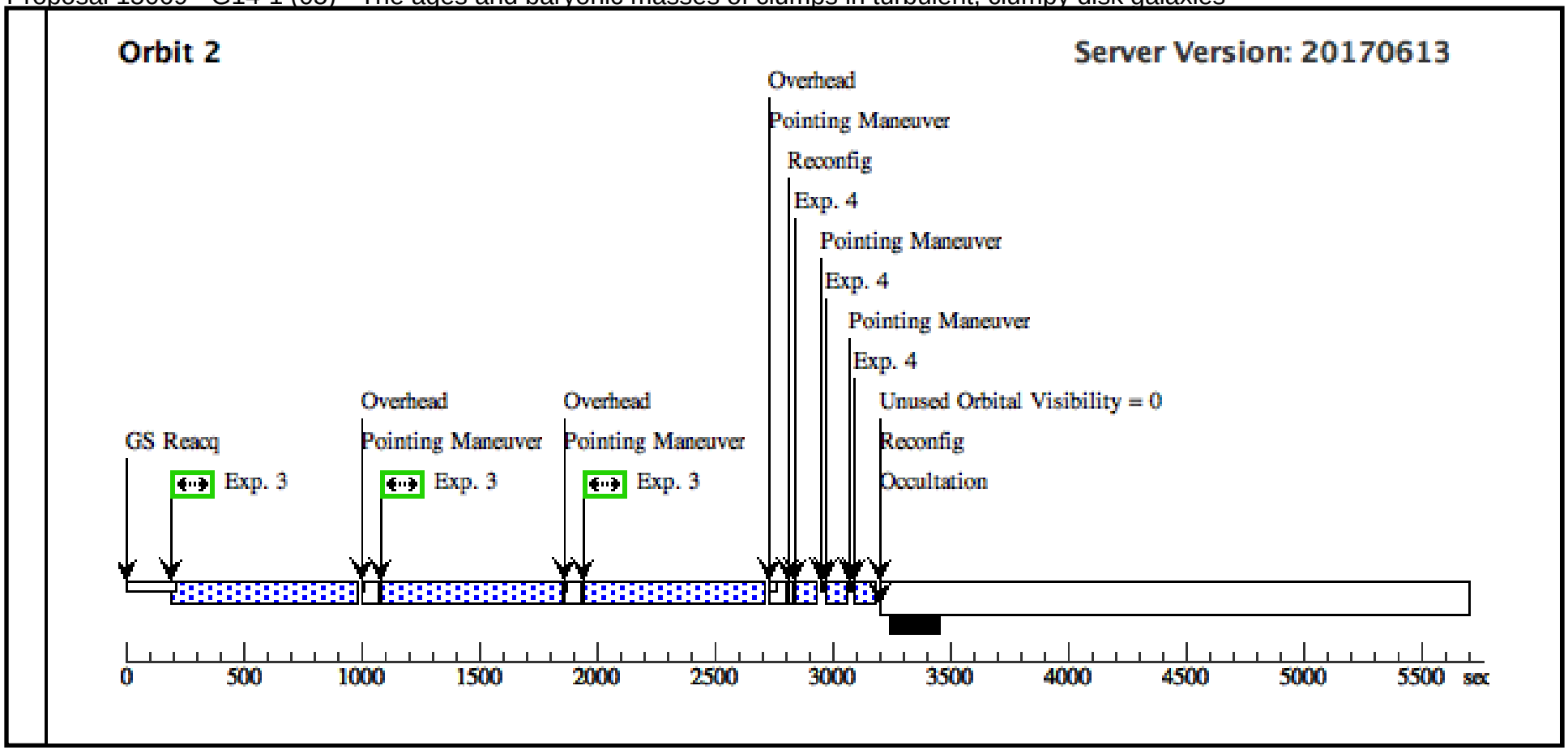
| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (5) | G14-1 | RA: 14 54 28.3300 (223.6180417d)<br>Dec: +00 44 34.30 (.74286d)<br>Equinox: J2000 | | V=18.3+/-.3 | Reference Frame: ICRS |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (5) G14-1 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F336W | FLASH=10 | | Pattern 1, Exps 1-1 in G14-1 (05) (1) | 600 Secs (1800 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 2 | | (5) G14-1 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F467M | FLASH=11 | | Pattern 1, Exps 2-2 in G14-1 (05) (1) | 185 Secs (555 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 3 | | (5) G14-1 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F225W | FLASH=9 | | Pattern 1, Exps 3-3 in G14-1 (05) (1) | 770 Secs (2310 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |
| 4 | | (5) G14-1 | WFC3/IR, MULTIACCUM, IRSUB256 | F125W | SAMP-SEQ=SPARS25;<br>NSAMP=4 | | Pattern 2, Exps 4-4 in G14-1 (05) (2) | 67.315932 Secs (201.948 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |

Orbit Structure




Orbit 2
Server Version: 20170613
GS Reacq
Exp. 3
Overhead
Pointing Maneuver
Exp. 3
Overhead
Pointing Maneuver
Exp. 3
Overhead
Pointing Maneuver
Reconfig
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Unused Orbital Visibility = 0
Reconfig
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

## Visit

**Proposal 15069, D15-3 (06)** Thu Jul 20 19:02:25 GMT 2017

**Diagnostic Status: No Diagnostics**

Scientific Instruments: WFC3/IR, WFC3/UVIS

Special Requirements: (none)

## Patterns

| # | Primary Pattern | | Secondary Pattern | Exposures |
|---|---|---|---|---|
| (1) | Pattern Type=WFC3-UVIS-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.135<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=46.84<br>Angle Between Sides=<br>Center Pattern=false | | (1), (2), (3) |
| (2) | Pattern Type=WFC3-IR-DITHER-LINE-3PT<br>Purpose=DITHER<br>Number Of Points=3<br>Point Spacing=0.605<br>Line Spacing= | Coordinate Frame=POS-TARG<br>Pattern Orientation=41.788<br>Angle Between Sides=<br>Center Pattern=false | | (4) |

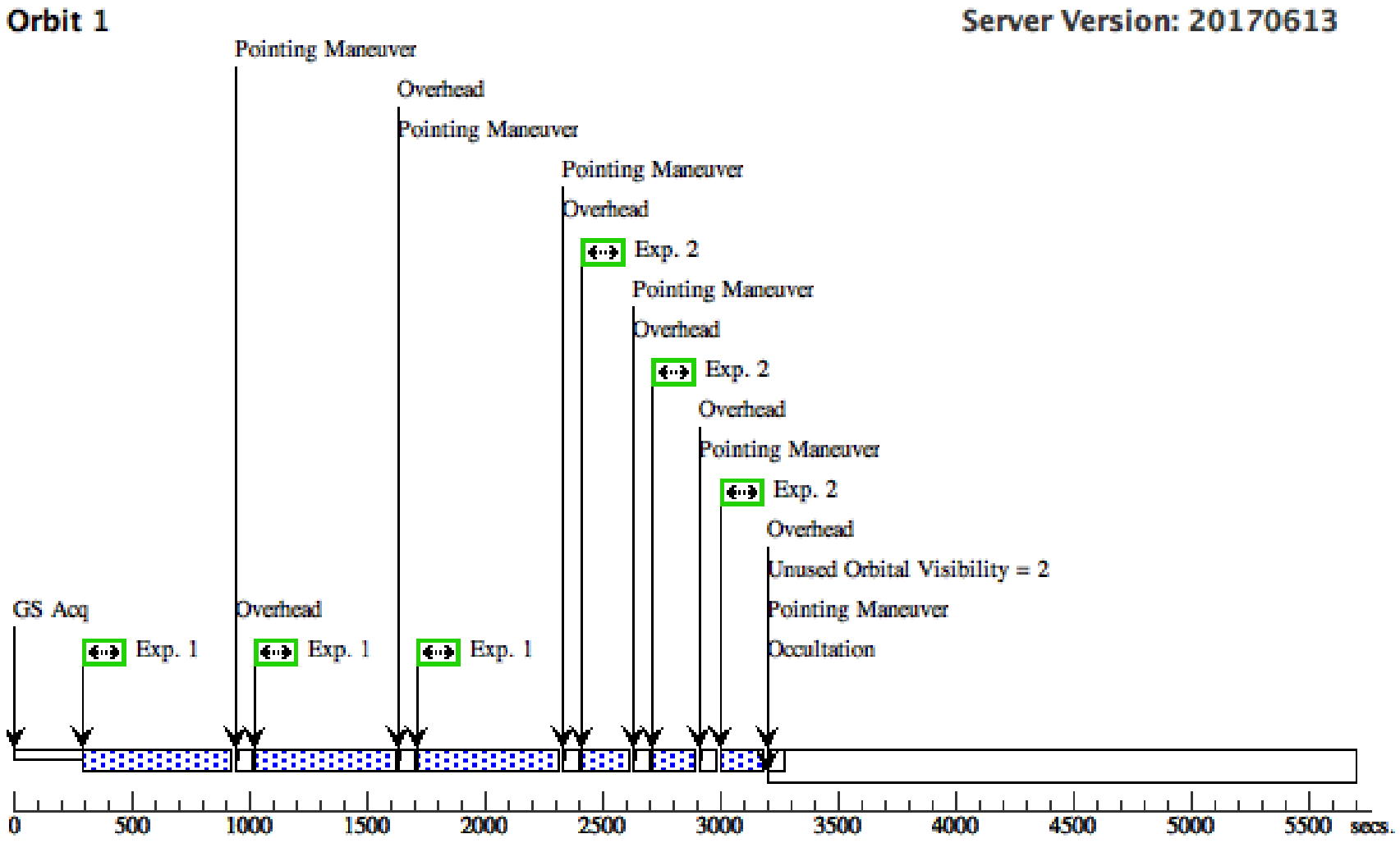
## Fixed Targets

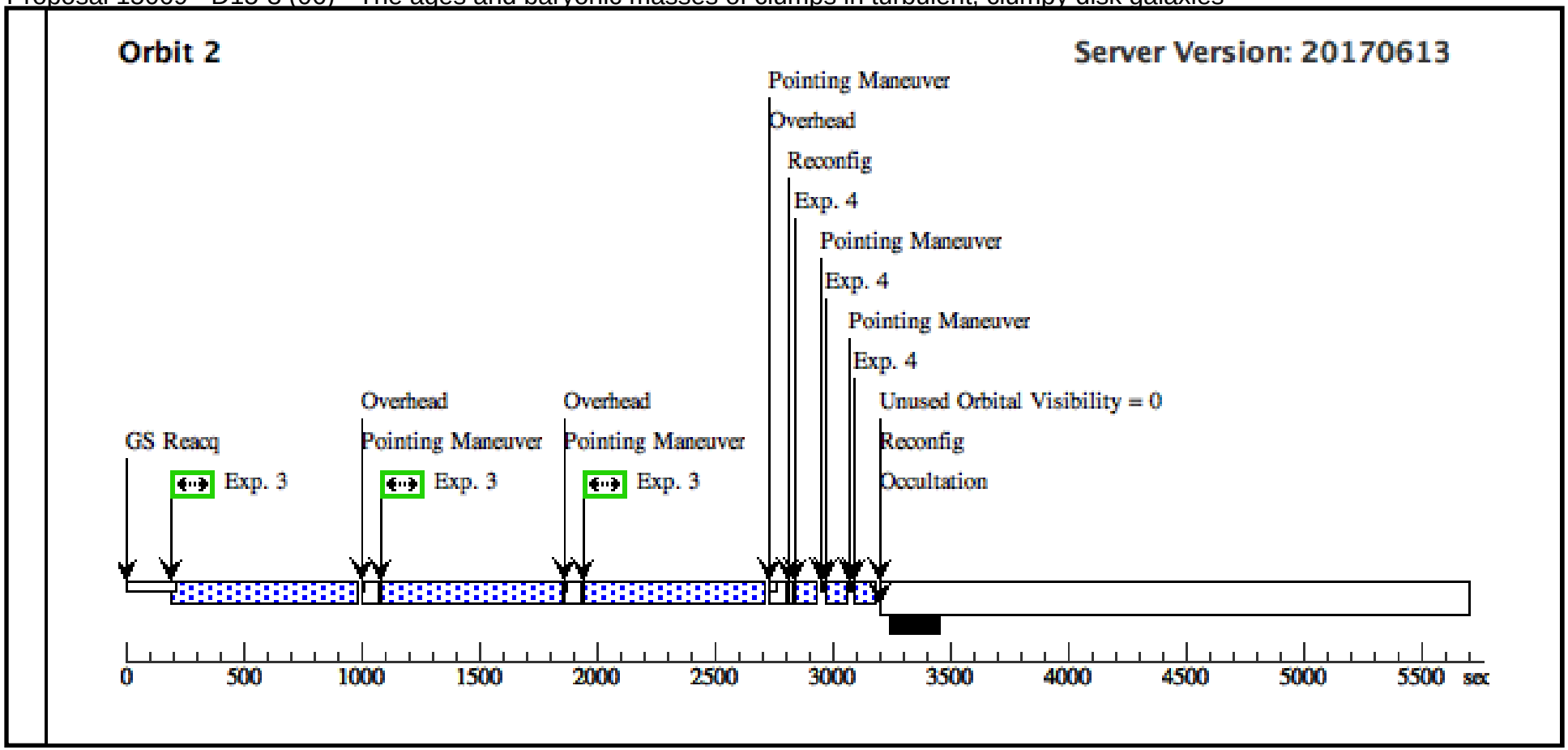
| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (6) | D15-3 | RA: 15 34 35.3900 (233.6474583d)<br>Dec: -00 28 44.50 (-.47903d)<br>Equinox: J2000 | | V=17.0+/-.3 | Reference Frame: ICRS |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (6) D15-3 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F336W | FLASH=10 | | Pattern 1, Exps 1-1 in D15-3 (06) (1) | 600 Secs (1800 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 2 | | (6) D15-3 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F467M | FLASH=11 | | Pattern 1, Exps 2-2 in D15-3 (06) (1) | 185 Secs (555 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[1]*** |
| 3 | | (6) D15-3 | WFC3/UVIS, ACCUM, UVIS2-M1K1C-SUB | F225W | FLASH=9 | | Pattern 1, Exps 3-3 in D15-3 (06) (1) | 770 Secs (2310 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |
| 4 | | (6) D15-3 | WFC3/IR, MULTIACCUM, IRSUB256 | F125W | SAMP-SEQ=SPARS25;<br>NSAMP=4 | | Pattern 2, Exps 4-4 in D15-3 (06) (2) | 67.315932 Secs (201.948 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]* | ***[2]*** |

Orbit Structure




Orbit 2
Server Version: 20170613
Pointing Maneuver
Overhead
Reconfig
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Unused Orbital Visibility = 0
Reconfig
Occultation
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Pointing Maneuver
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Overhead
Pointing Maneuver
Exp. 3
GS Reacq
Exp. 3
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec