



15910 - Galaxy evolution in a massive $z=2.91$ halo fed by cold accretion

Cycle: 27, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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|---|--|-------------------------------|
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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) RO-1001 | WFC3/IR | 3 | 01-Apr-2020 11:00:13.0 | yes |
| 06 | (1) RO-1001 | WFC3/IR | 3 | 01-Apr-2020 11:00:15.0 | yes |
| 09 | (1) RO-1001 | WFC3/UVIS | 3 | 01-Apr-2020 11:00:16.0 | yes |
| 10 | (1) RO-1001 | WFC3/IR | 2 | 01-Apr-2020 11:00:17.0 | yes |
| 50 | (1) RO-1001 | WFC3/IR | 2 | 01-Apr-2020 11:00:18.0 | yes |

13 Total Orbits Used

ABSTRACT

We have recently discovered and spectroscopically confirmed a structure consistent with a forming, single massive halo at $z=2.91$ in the COSMOS field. With a total mass estimated at about 5×10^{13} , this is the highest redshift bonafide cluster/group known to date. Keck/KCWI observations

Proposal 15910 (STScI Edit Number: 1, Created: Wednesday, April 1, 2020 at 10:00:19 AM Eastern Standard Time) - Overview revealed a luminous Ly α nebula well centered on the stellar mass overdensity, surrounded by three filaments with a factor of 10 lower surface brightness, extending over a 320 kpc diameter out to the virial radius. A variety of observables suggest that we are in presence of a textbook-case of cold accretion onto a massive high- z halo. The existing multiwavelength data, including the COSMOS single orbit with F814W, only scratch the surface of the galaxy content of this system. We propose 11 orbits of HST imaging with WFC3IR in F160W/F125W and WFC3/UV F606W that will allow us to obtain a complete census of the galaxies inhabiting this structure down to low stellar masses, together with passive/star forming classification and morphological information. The bluer filters will unveil any unreddened star formation down to very deep levels, complementing the information about dust-obscured star formation from ALMA, NOEMA, and radio. We will be able to distinguish physical properties of galaxies located in the halo core, in the accreting filaments, and outside of them. Given the importance to study galaxy transformations, quenching, and the role of gas accretion on galaxy evolution in massive halos at the highest possible redshift, this program represents a unique opportunity of carrying out this kind of investigation at the frontiers of current knowledge.

OBSERVING DESCRIPTION

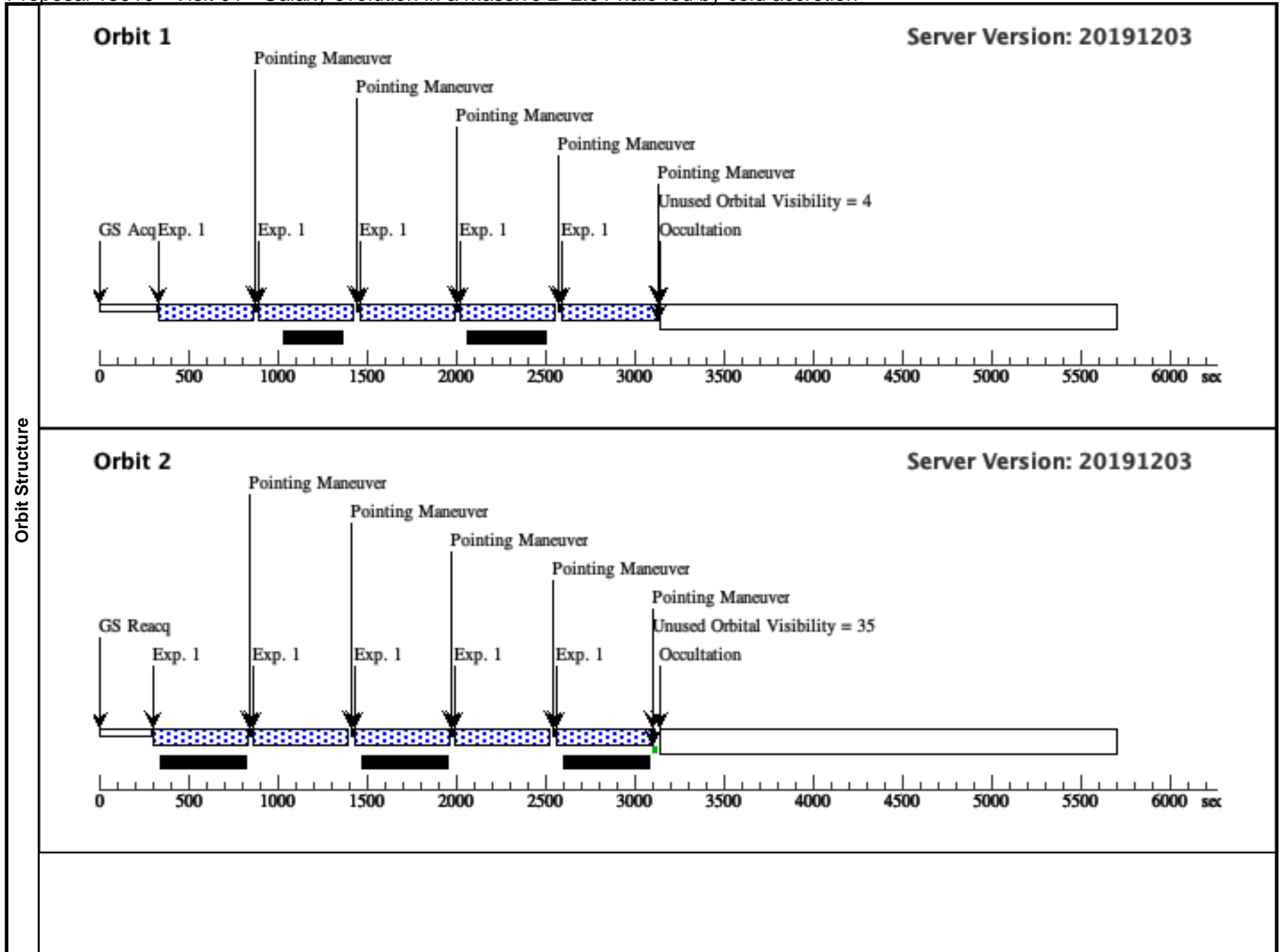
This is a simple WFC3 imaging proposal of a single target in 3 filters.

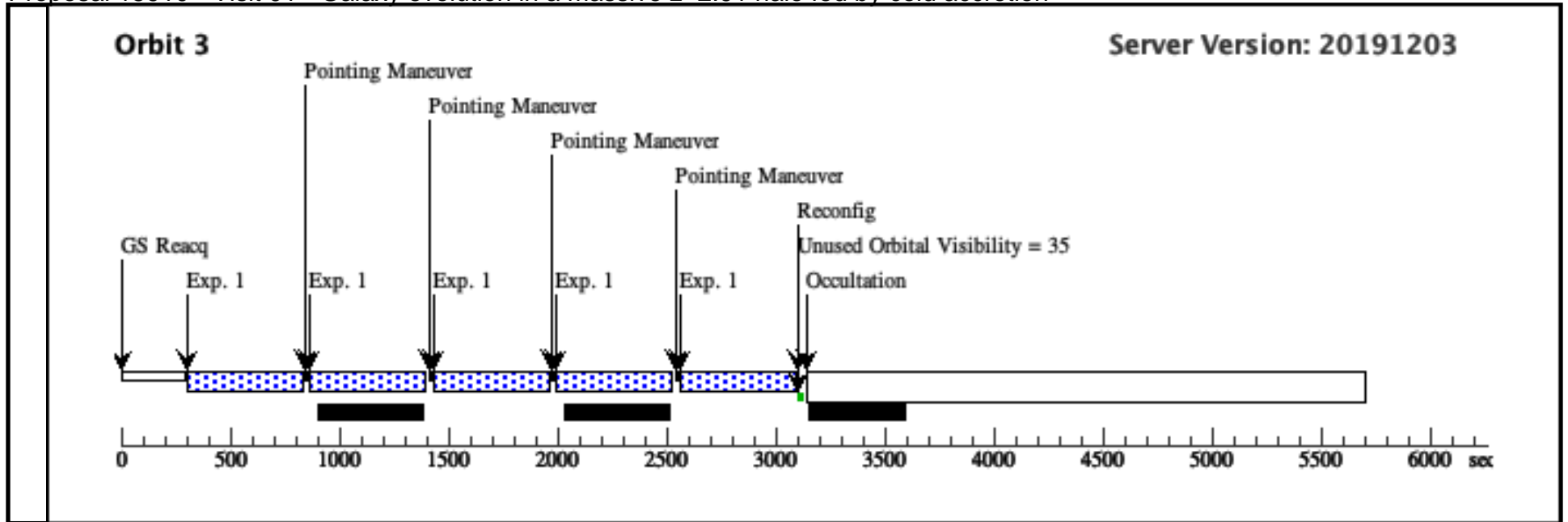
We have defined a single visit for observations in F606W and F125W, in order to have control on the resulting dithering pattern which will optimize coverage and PSF reconstruction. The 5 orbits of F160W imaging are split into two visits to easy scheduling.

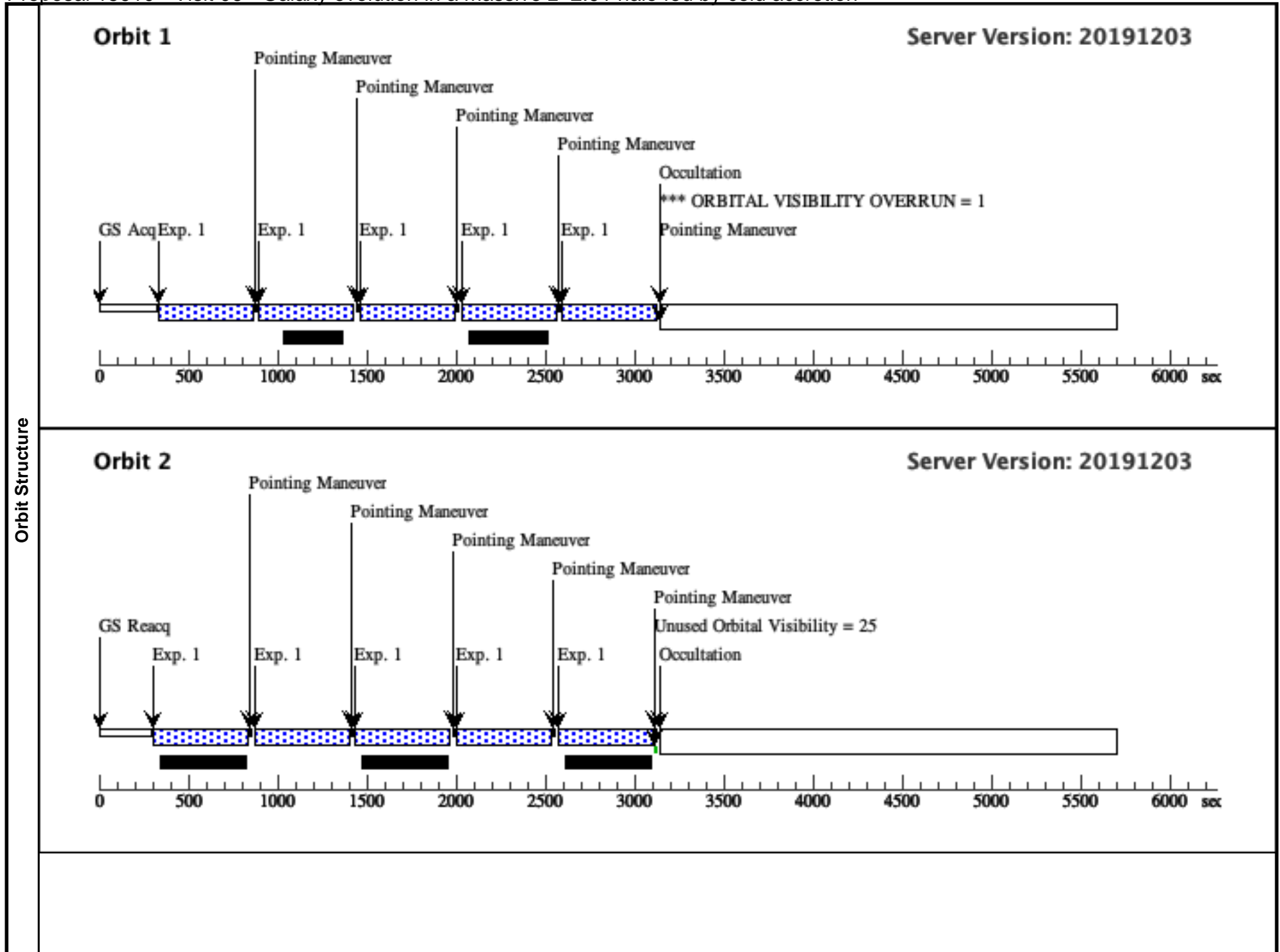
Proposal 15910 - Visit 01 - Galaxy evolution in a massive z=2.91 halo fed by cold accretion

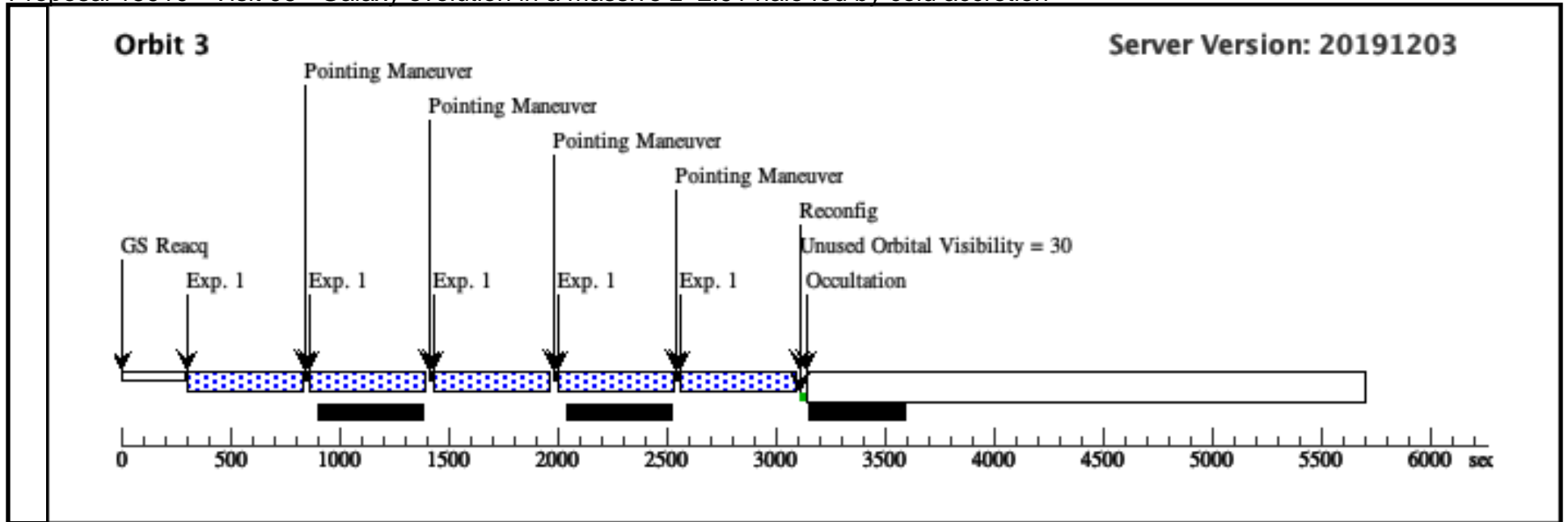
Wed Apr 01 15:00:19 GMT 2020

| Visit | Proposal 15910, Visit 01, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: (none) | | | | | | | | | |
|---------------|---|--|--|--|---------------|-----------------------------------|---------------|--|---|-------|
| | Patterns | # | Primary Pattern | Secondary Pattern | Exposures | | | | | |
| | (4) | Pattern Type=WFC3-IR-DITHER-BLOB Purpose=DITHER Number Of Points=3 Point Spacing=5.183 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=41.859 Angle Between Sides= Center Pattern=true | Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=5 Point Spacing=0.636 Line Spacing= | (1) | | | | | |
| Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | | |
| | (1) | RO-1001 | RA: 10 01 23.0140 (150.3458917d) Dec: +02 20 2.73 (2.33409d) Equinox: J2000 | | V=25 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category=CLUSTER OF GALAXIES Description=[EMISSION LINE NEBULA] | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) RO-1001 | WFC3/IR, MULTIACCUM, IR | F160W | SAMP-SEQ=SPARS 50; NSAMP=11 | | Pattern 4, Exps 1-1 in Visit 01 (4) | 502.936801 Secs (7544.052 Secs) [==>(Pattern 1,1)] [==>(Pattern 1,2)] [==>(Pattern 1,3)] [==>(Pattern 1,4)] [==>(Pattern 1,5)] | [1] |
| | | | | | | | | [==>(Pattern 2,1)] [==>(Pattern 2,2)] [==>(Pattern 2,3)] [==>(Pattern 2,4)] [==>(Pattern 2,5)] | [2] | |
| | | | | | | | | [==>(Pattern 3,1)] [==>(Pattern 3,2)] [==>(Pattern 3,3)] [==>(Pattern 3,4)] [==>(Pattern 3,5)] | [3] | |





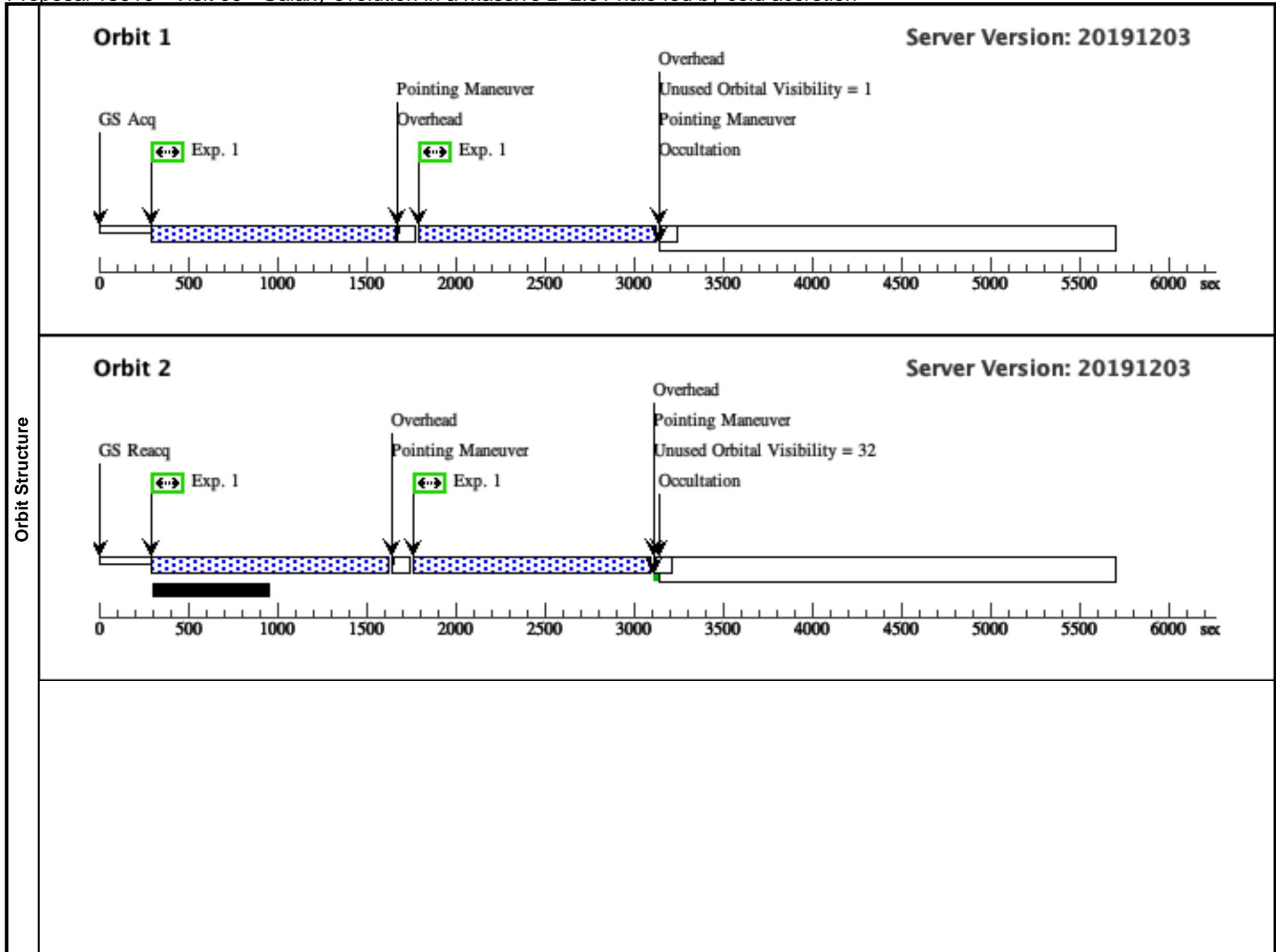


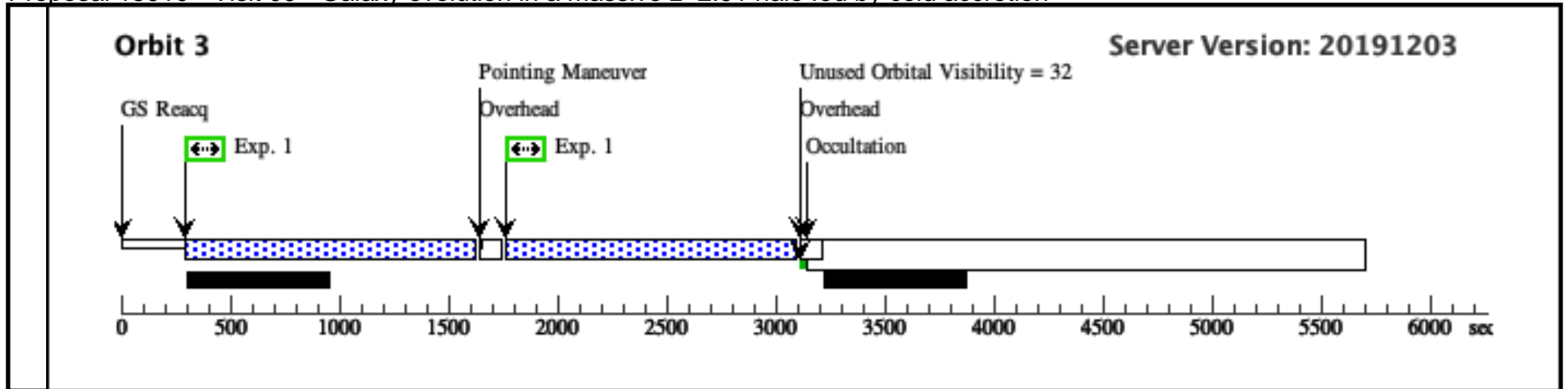


Proposal 15910 - Visit 09 - Galaxy evolution in a massive z=2.91 halo fed by cold accretion

Wed Apr 01 15:00:19 GMT 2020

| Visit | Proposal 15910, Visit 09, scheduled Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none) | | | | | | | | | |
|---------------|---|---------|---|--|--|--|---------------|---|---------------------------------|-------|
| | Patterns | # | Primary Pattern | | | Secondary Pattern | | | Exposures | |
| | | (6) | Pattern Type=WFC3-UVIS-GAP-LINE Purpose=MOSAIC Number Of Points=2 Point Spacing=2.414 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=85.759 Angle Between Sides= Center Pattern=true | Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=1.485 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false | (1) | | | |
| Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | | |
| | (1) | RO-1001 | RA: 10 01 23.0140 (150.3458917d) Dec: +02 20 2.73 (2.33409d) Equinox: J2000 | | V=25 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category=CLUSTER OF GALAXIES Description=[EMISSION LINE NEBULA] | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) RO-1001 | WFC3/UVIS, ACCUM, UVIS | F606W | | | Pattern 6, Exps 1-1 i n Visit 09 (6) | 1336 Secs (8016 Secs) | |
| | | | | | | | | | [=>(Pattern 1,1)] | [1] |
| | | | | | | | | | [=>(Pattern 1,2)] | [2] |
| | | | | | | | | | [=>(Pattern 1,3)] | [3] |
| | | | | | | | | [=>(Pattern 2,1)] | [2] | |
| | | | | | | | | [=>(Pattern 2,2)] | [3] | |
| | | | | | | | | [=>(Pattern 2,3)] | [3] | |

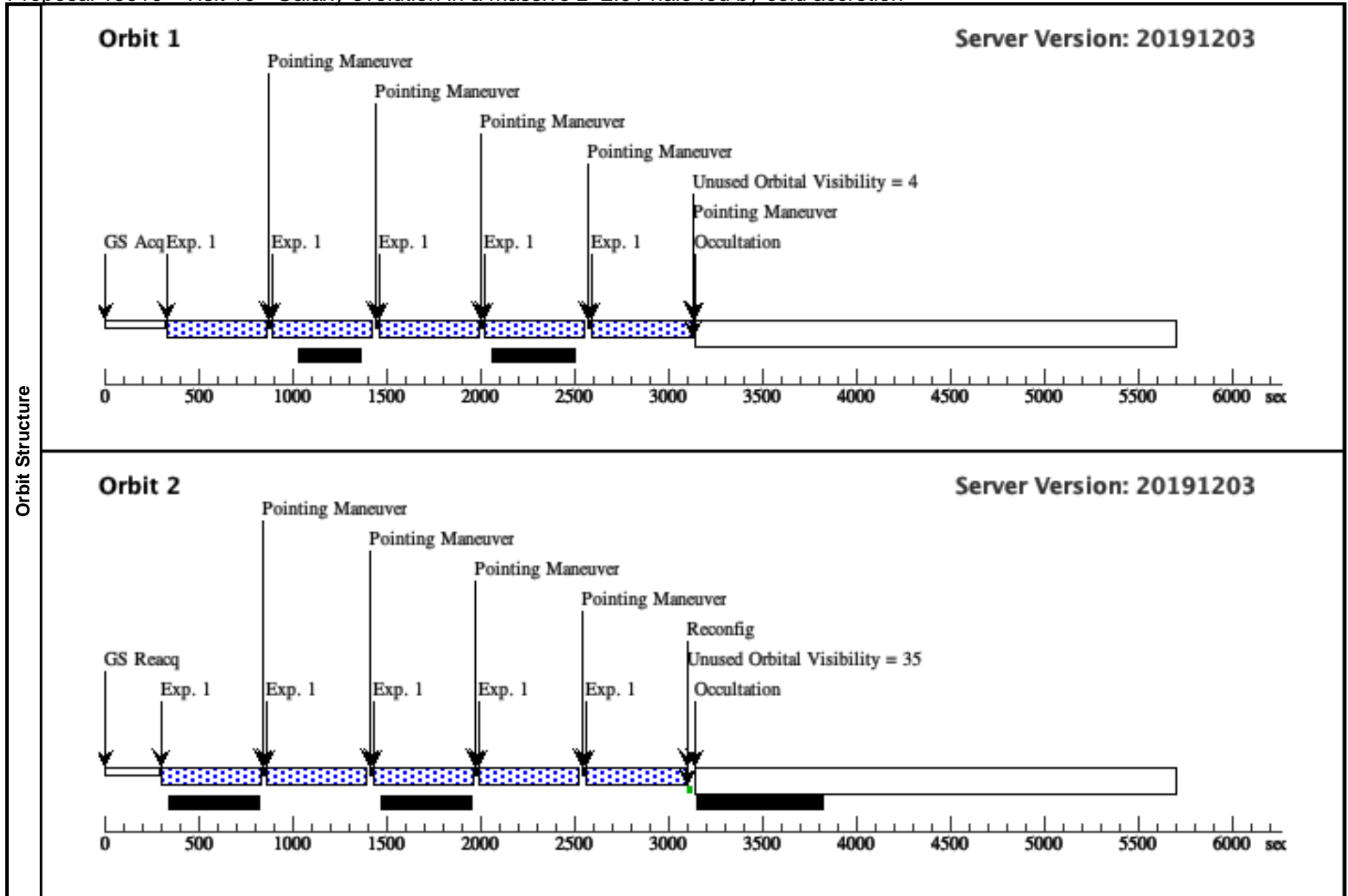




Proposal 15910 - Visit 10 - Galaxy evolution in a massive z=2.91 halo fed by cold accretion

Wed Apr 01 15:00:19 GMT 2020

| Visit | Proposal 15910, Visit 10, failed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: (none) | | | | | | | | | |
|---------------|--|---------|--|--|--|---|---------------|--|---|-------|
| | Patterns | # | Primary Pattern | | | Secondary Pattern | | | Exposures | |
| | | (5) | Pattern Type=WFC3-IR-DITHER-BLOB Purpose=DITHER Number Of Points=2 Point Spacing=5.183 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=41.859 Angle Between Sides= Center Pattern=true | Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=5 Point Spacing=0.636 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false | (1) | | | |
| Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | | |
| | (1) | RO-1001 | RA: 10 01 23.0140 (150.3458917d) Dec: +02 20 2.73 (2.33409d) Equinox: J2000 | | V=25 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category=CLUSTER OF GALAXIES Description=[EMISSION LINE NEBULA] | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) RO-1001 | WFC3/IR, MULTIACCUM, IR | F160W | SAMP-SEQ=SPARS 50; NSAMP=11 | | Pattern 5, Exps 1-1 in Visit 10 (5) | 502.936801 Secs (5029.368 Secs) [==>(Pattern 1,1)] [==>(Pattern 1,2)] [==>(Pattern 1,3)] [==>(Pattern 1,4)] [==>(Pattern 1,5)] | [1] |
| | | | | | | | | [==>(Pattern 2,1)] [==>(Pattern 2,2)] [==>(Pattern 2,3)] [==>(Pattern 2,4)] [==>(Pattern 2,5)] | [2] | |



Proposal 15910 - Visit 50 - Galaxy evolution in a massive z=2.91 halo fed by cold accretion

Wed Apr 01 15:00:20 GMT 2020

| Visit | Proposal 15910, Visit 50 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: (none) | | | | | | | | | |
|---------------|--|---------|--|--|--|---|---------------|--|---|-------|
| | Patterns | # | Primary Pattern | | | Secondary Pattern | | | Exposures | |
| | | (5) | Pattern Type=WFC3-IR-DITHER-BLOB Purpose=DITHER Number Of Points=2 Point Spacing=5.183 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=41.859 Angle Between Sides= Center Pattern=true | Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=5 Point Spacing=0.636 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false | (1) | | | |
| Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | | |
| | (1) | RO-1001 | RA: 10 01 23.0140 (150.3458917d) Dec: +02 20 2.73 (2.33409d) Equinox: J2000 | | V=25 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category=CLUSTER OF GALAXIES Description=[EMISSION LINE NEBULA] | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) RO-1001 | WFC3/IR, MULTIACCUM, IR | F160W | SAMP-SEQ=SPARS 50; NSAMP=11 | | Pattern 5, Exps 1-1 in Visit 50 (5) | 502.936801 Secs (5029.368 Secs) [==>(Pattern 1,1)] [==>(Pattern 1,2)] [==>(Pattern 1,3)] [==>(Pattern 1,4)] [==>(Pattern 1,5)] | [1] |
| | | | | | | | | [==>(Pattern 2,1)] [==>(Pattern 2,2)] [==>(Pattern 2,3)] [==>(Pattern 2,4)] [==>(Pattern 2,5)] | [2] | |

