



15842 - Unprecedented Spatial Resolution in a Strongly Magnified $z \sim 6$ Galaxy

Cycle: 27, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

| <i>Name</i> | <i>Institution</i> | <i>E-Mail</i> |
|--|---|----------------------------|
| Dr. Dan Coe (PI) (ESA Member) (Contact) | Space Telescope Science Institute - ESA | dcoe@stsci.edu |
| Dr. Brett Salmon (CoI) | Space Telescope Science Institute | bsalmon@stsci.edu |
| Dr. Larry Bradley (CoI) (Contact) | Space Telescope Science Institute | lbradley@stsci.edu |
| Prof. Keren Sharon (CoI) | University of Michigan | kerens@umich.edu |
| Dr. Guillaume Mahler (CoI) | University of Michigan | guillaume.mahler@gmail.com |
| Dr. Adi Zitrin (CoI) | Ben Gurion University of the Negev | adizitrin@gmail.com |
| Ana Acebron (CoI) | Ben Gurion University of the Negev | anaacebronmunoz@gmail.com |
| Brian Welch (CoI) | The Johns Hopkins University | bwelch7@jhu.edu |
| Prof. Marusa Bradac (CoI) | University of California - Davis | marusa@physics.ucdavis.edu |
| Victoria Strait (CoI) | University of California - Davis | vbstrait@ucdavis.edu |
| Prof. Pascal Oesch (CoI) (ESA Member) | Observatoire de Geneve | pascal.oesch@unige.ch |
| Prof. Michele Trenti (CoI) | University of Melbourne | mtrenti@unimelb.edu.au |
| Dr. Masami Ouchi (CoI) | University of Tokyo, Institute of Cosmic Ray Research | ouchims@icrr.u-tokyo.ac.jp |
| Prof. Brenda Louise Frye (CoI) | University of Arizona | bfrye@as.arizona.edu |
| Roberto Avila (CoI) | Space Telescope Science Institute | avila@stsci.edu |
| Ms. Sara Ogaz (CoI) | Space Telescope Science Institute | ogaz@stsci.edu |
| Dr. Steve Rodney (CoI) | University of South Carolina Research Foundation | steve.rodney@gmail.com |
| Dr. Louis-Gregory Strolger (CoI) | Space Telescope Science Institute | strolger@stsci.edu |

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> |
|--------------|-------------------------------|-------------------------------------|--------------------|-------------------------------|-------------------------------|
| 4A | (1) WHL-J24.3324-8.477 ANY | ACS/WFC WFC3/IR | 1 | 26-Jul-2019 08:00:25.0 | yes |
| 8A | (1) WHL-J24.3324-8.477 ANY | ACS/WFC WFC3/IR | 1 | 26-Jul-2019 08:00:27.0 | yes |
| 8B | (1) WHL-J24.3324-8.477 ANY | ACS/WFC WFC3/IR | 1 | 26-Jul-2019 08:00:28.0 | yes |
| 8C | (1) WHL-J24.3324-8.477 ANY | ACS/WFC WFC3/UVIS | 1 | 26-Jul-2019 08:00:30.0 | yes |
| 1A | (1) WHL-J24.3324-8.477 ANY | ACS/WFC WFC3/IR | 1 | 26-Jul-2019 08:00:31.0 | yes |
| 4X | (1) WHL-J24.3324-8.477 ANY | ACS/WFC WFC3/UVIS | 1 | 26-Jul-2019 08:00:32.0 | yes |
| 8X | (1) WHL-J24.3324-8.477 ANY | ACS/WFC WFC3/UVIS | 1 | 26-Jul-2019 08:00:33.0 | yes |
| 8Y | (1) WHL-J24.3324-8.477 ANY | ACS/WFC WFC3/IR | 1 | 26-Jul-2019 08:00:35.0 | yes |
| 1X | (1) WHL-J24.3324-8.477 ANY | ACS/WFC WFC3/IR | 1 | 26-Jul-2019 08:00:36.0 | yes |

9 Total Orbits Used

ABSTRACT

The combined powers of HST and gravitational lensing have delivered strongly magnified images of distant galaxies, revealing detailed structures at ~ 100 pc resolution or better at $z \sim 1 - 5$. Here we propose to extend that work to $z \sim 6$ and reveal the highest spatial resolutions yet studied at $z > 1$. The RELICS HST Treasury Program recently yielded the longest lensed image of any galaxy at $z \sim 6$, observed in the first billion years. The shallow WFC3/IR imaging was only sufficient to detect the brightest star-forming knots, while the ACS imaging did not significantly detect any of the knots individually. Here we propose deeper ACS F814W imaging to reveal unprecedented levels of spatial detail, resolving star forming clumps as small as $r \sim 20$ pc. We also propose deeper WFC3/IR imaging in F110W to reveal the full extent of the arc. Finally we add bluer imaging with ACS F475W. The combined data will critically enable us to identify other multiply-imaged galaxies, significantly improving the strong lens model. Based

Proposal 15842 (STScI Edit Number: 0, Created: Friday, July 26, 2019 at 7:00:37 AM Eastern Standard Time) - Overview

on these new data, this exceptional 15" long $z \sim 6$ arc will enable us to study star formation efficiency in clumps smaller than $r \sim 100$ pc for the first time at this epoch. This type of science has been envisioned for the ELTs and LUVOIR; we will do it now with HST. We waive any proprietary period to these data, in the spirit of the RELICS observing program that led to this discovery.

OBSERVING DESCRIPTION

This program will obtain 9 orbits of HST imaging on the core of the galaxy cluster WHL0137-08 and a parallel field. The imaging overlaps the existing RELICS imaging, both the prime and parallel fields.

We divide our 9 orbits among 3 filters:

2 orbits ACS F475W

5 orbits ACS F814W

2 orbits WFC3/IR F110W

For every filter, we split our observations between two epochs separated by 20+ days to enable a search for supernovae and other transients.

Within each orbit, we will obtain 4 exposures in a single filter, using small dithers to optimally sample the PSF. Between orbits, we will perform larger dithers to cover the ACS chip gap and WFC3/IR death star.

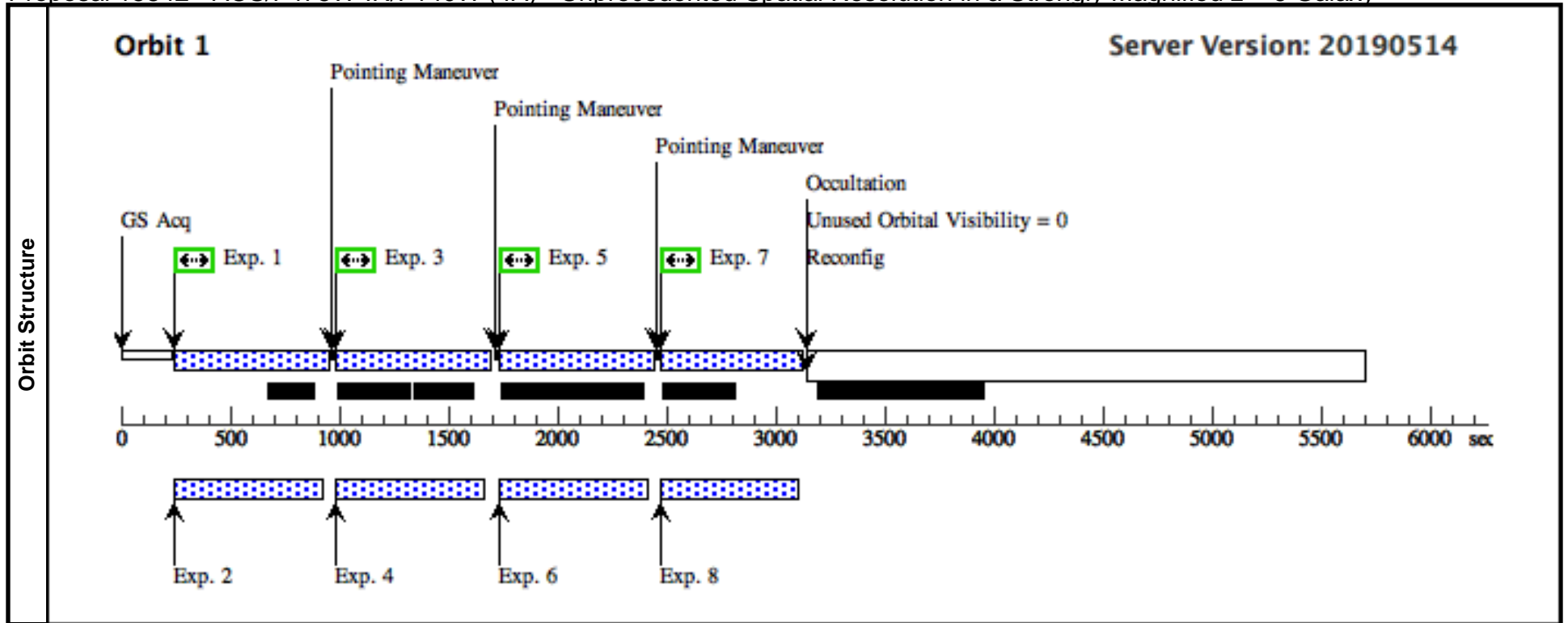
The desired orient roll angle is 60.6 deg to best overlap the existing RELICS HST imaging. The 2 orbits of ACS parallels (with WFC3 in prime) would land on the RELICS WFC3 imaging. The 7 orbits of WFC3 parallels (with ACS in prime) would create a new parallel field. This roll angle is rotated 180 degrees from that performed by RELICS.

EARLY SCHEDULING prior to the JWST call for proposal deadline is our priority, if possible. Therefore, we relax our roll constraints to 50 - 75 deg to increase schedulability. This range still provides decent overlap with the RELICS archival HST imaging.

Proposal 15842 - ACS/F475W-IR/F140W (4A) - Unprecedented Spatial Resolution in a Strongly Magnified z ~ 6 Galaxy

Fri Jul 26 12:00:37 GMT 2019

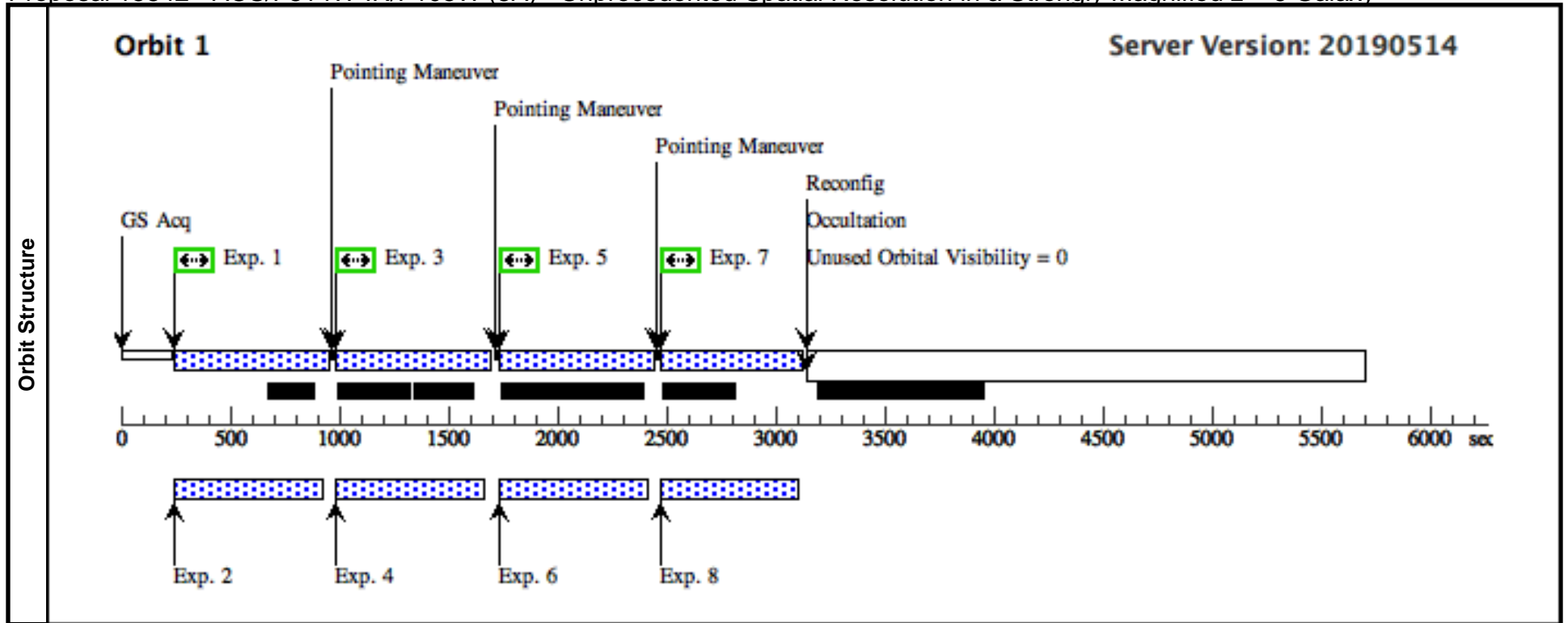
| Visit | Proposal 15842, ACS/F475W-IR/F140W (4A) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: ORIENT 50D TO 75 D | | | | | | | | | |
|-----------|--|--------------------|--|-----------------------------|--------------------------|-----------------------------------|---|---|---|-------|
| | Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | |
| | (1) | WHL-J24.3324-8.477 | RA: 01 37 25.0000 (24.3541667d) Dec: -08 27 25.00 (-8.45694d) Equinox: J2000 | | V=18 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category=CLUSTER OF GALAXIES Description=[GRAVITATIONAL LENS, RICH CLUSTER] | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F475W | | POS TARG 0.0; GS ACQ SCENARI O SINGLE | Prime + Parallel Group 1-2 in ACS/F475W-IR/F140W (4A) | 507 Secs (507 Secs) [==>] | [1] |
| | 2 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F140W | SAMP-SEQ=SPARS 50; NSAMP=14 | | Prime + Parallel Group 1-2 in ACS/F475W-IR/F140W (4A) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 3 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F475W | | POS TARG 0.247,0.094 | Prime + Parallel Group 3-4 in ACS/F475W-IR/F140W (4A) | 586 Secs (586 Secs) [==>] | [1] |
| | 4 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F140W | SAMP-SEQ=SPARS 50; NSAMP=14 | | Prime + Parallel Group 3-4 in ACS/F475W-IR/F140W (4A) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 5 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F475W | | POS TARG 0.124,0.232 | Prime + Parallel Group 5-6 in ACS/F475W-IR/F140W (4A) | 586 Secs (586 Secs) [==>] | [1] |
| | 6 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F140W | SAMP-SEQ=SPARS 50; NSAMP=14 | | Prime + Parallel Group 5-6 in ACS/F475W-IR/F140W (4A) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 7 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F475W | | POS TARG -0.124,0.138 | Prime + Parallel Group 7-8 in ACS/F475W-IR/F140W (4A) | 531 Secs (531 Secs) [==>] | [1] |
| | 8 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F140W | SAMP-SEQ=SPARS 50; NSAMP=13 | | Prime + Parallel Group 7-8 in ACS/F475W-IR/F140W (4A) | 602.937703 Secs (602.938 Secs) [==>] | [1] |



Proposal 15842 - ACS/F814W-IR/F105W (8A) - Unprecedented Spatial Resolution in a Strongly Magnified z ~ 6 Galaxy

Fri Jul 26 12:00:37 GMT 2019

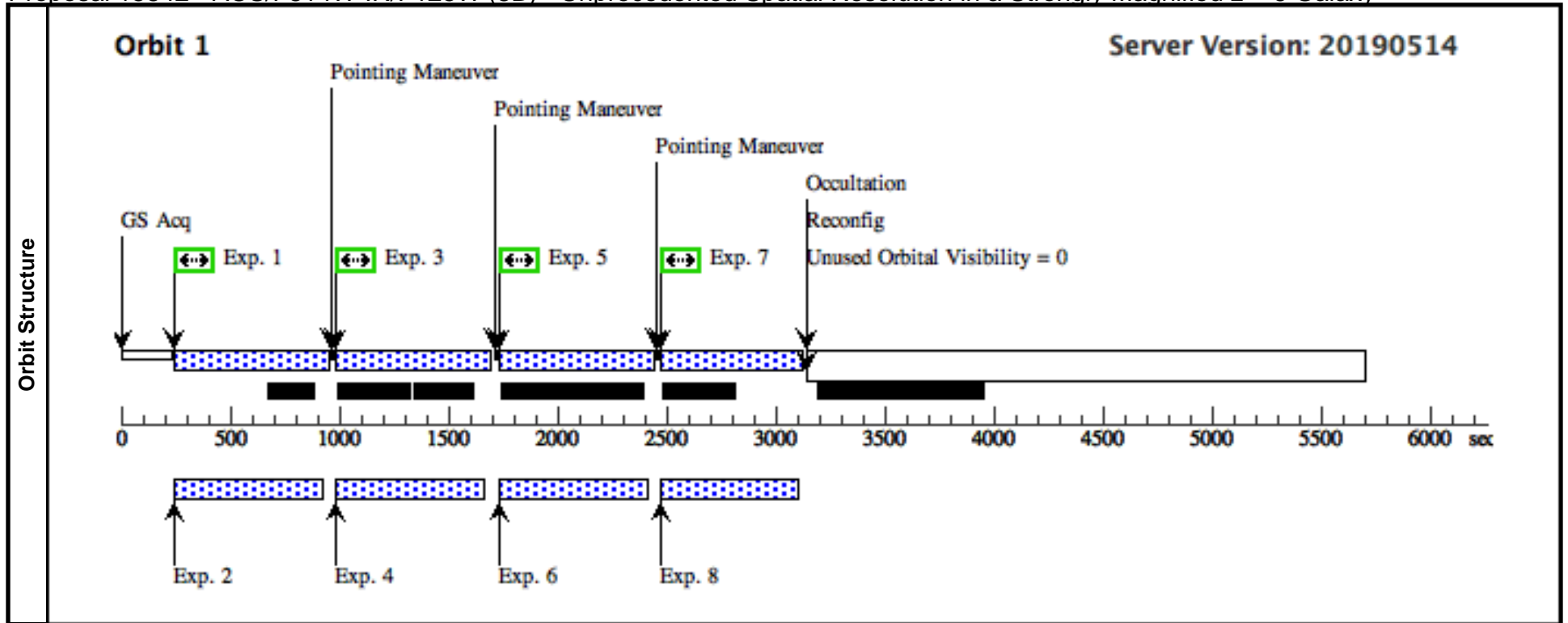
| Visit | Proposal 15842, ACS/F814W-IR/F105W (8A) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: SAME ORIENT AS 4A | | | | | | | | | |
|-----------|---|--------------------|--|-----------------------------|--------------------------|-----------------------|-----------------------------------|---|---|-------|
| | Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | |
| | (1) | WHL-J24.3324-8.477 | RA: 01 37 25.0000 (24.3541667d) Dec: -08 27 25.00 (-8.45694d) Equinox: J2000 | | V=18 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category= <i>CLUSTER OF GALAXIES</i> Description= <i>[GRAVITATIONAL LENS, RICH CLUSTER]</i> | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | GS ACQ SCENARI O SINGLE | Prime + Parallel Group 1-2 in ACS/F814W-IR/F105W (8A) | 507 Secs (507 Secs) [==>] | [1] |
| | 2 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F105W | | SAMP-SEQ=SPARS 50; NSAMP=14 | Prime + Parallel Group 1-2 in ACS/F814W-IR/F105W (8A) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 3 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.247,0.094 | Prime + Parallel Group 3-4 in ACS/F814W-IR/F105W (8A) | 586 Secs (586 Secs) [==>] | [1] |
| | 4 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F105W | | SAMP-SEQ=SPARS 50; NSAMP=14 | Prime + Parallel Group 3-4 in ACS/F814W-IR/F105W (8A) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 5 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.124,0.232 | Prime + Parallel Group 5-6 in ACS/F814W-IR/F105W (8A) | 586 Secs (586 Secs) [==>] | [1] |
| | 6 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F105W | | SAMP-SEQ=SPARS 50; NSAMP=14 | Prime + Parallel Group 5-6 in ACS/F814W-IR/F105W (8A) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 7 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG -0.124,0.138 | Prime + Parallel Group 7-8 in ACS/F814W-IR/F105W (8A) | 531 Secs (531 Secs) [==>] | [1] |
| | 8 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F105W | | SAMP-SEQ=SPARS 50; NSAMP=13 | Prime + Parallel Group 7-8 in ACS/F814W-IR/F105W (8A) | 602.937703 Secs (602.938 Secs) [==>] | [1] |



Proposal 15842 - ACS/F814W-IR/F125W (8B) - Unprecedented Spatial Resolution in a Strongly Magnified z ~ 6 Galaxy

Fri Jul 26 12:00:37 GMT 2019

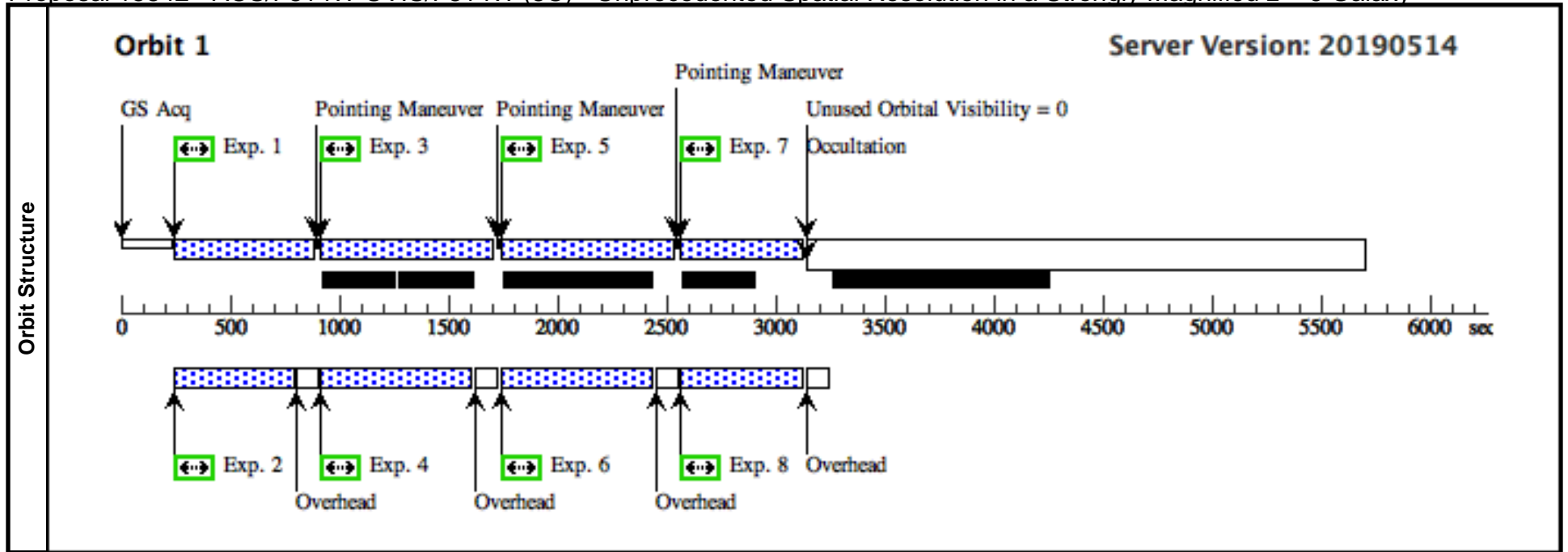
| Visit | Proposal 15842, ACS/F814W-IR/F125W (8B) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: SAME ORIENT AS 4A | | | | | | | | | |
|-----------|---|--------------------|--|-----------------------------|--------------------------|-----------------------|---|---|---|-------|
| | Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | |
| | (1) | WHL-J24.3324-8.477 | RA: 01 37 25.0000 (24.3541667d) Dec: -08 27 25.00 (-8.45694d) Equinox: J2000 | | V=18 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category= <i>CLUSTER OF GALAXIES</i> Description= <i>[GRAVITATIONAL LENS, RICH CLUSTER]</i> | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.124,1.492; GS ACQ SCENARIO SINGLE | Prime + Parallel Group 1-2 in ACS/F814W-IR/F125W (8B) | 507 Secs (507 Secs) [==>] | [1] |
| | 2 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F125W | | SAMP-SEQ=SPARS 50; NSAMP=14 | Prime + Parallel Group 1-2 in ACS/F814W-IR/F125W (8B) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 3 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.371,1.586 | Prime + Parallel Group 3-4 in ACS/F814W-IR/F125W (8B) | 586 Secs (586 Secs) [==>] | [1] |
| | 4 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F125W | | SAMP-SEQ=SPARS 50; NSAMP=14 | Prime + Parallel Group 3-4 in ACS/F814W-IR/F125W (8B) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 5 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.248,1.724 | Prime + Parallel Group 5-6 in ACS/F814W-IR/F125W (8B) | 586 Secs (586 Secs) [==>] | [1] |
| | 6 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F125W | | SAMP-SEQ=SPARS 50; NSAMP=14 | Prime + Parallel Group 5-6 in ACS/F814W-IR/F125W (8B) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 7 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG -0.001,1.630 | Prime + Parallel Group 7-8 in ACS/F814W-IR/F125W (8B) | 531 Secs (531 Secs) [==>] | [1] |
| | 8 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F125W | | SAMP-SEQ=SPARS 50; NSAMP=13 | Prime + Parallel Group 7-8 in ACS/F814W-IR/F125W (8B) | 602.937703 Secs (602.938 Secs) [==>] | [1] |



Proposal 15842 - ACS/F814W-UVIS/F814W (8C) - Unprecedented Spatial Resolution in a Strongly Magnified z ~ 6 Galaxy

Fri Jul 26 12:00:37 GMT 2019

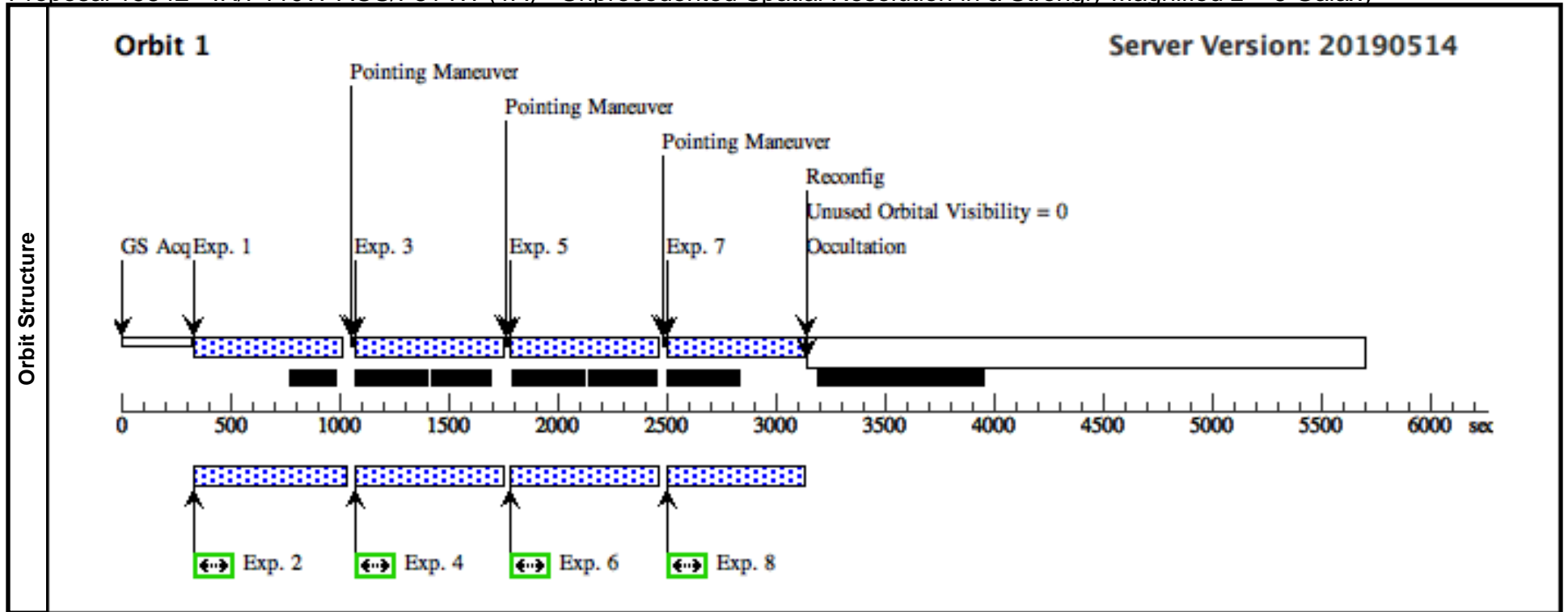
| Visit | Proposal 15842, ACS/F814W-UVIS/F814W (8C) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 4A | | | | | | | | | |
|-----------|---|--------------------|--|--------------------------|--------------------------|-----------------------|---|---|---------------------------------|-------|
| | Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | |
| | (1) | WHL-J24.3324-8.477 | RA: 01 37 25.0000 (24.3541667d) Dec: -08 27 25.00 (-8.45694d) Equinox: J2000 | | V=18 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category= <i>CLUSTER OF GALAXIES</i> Description= <i>[GRAVITATIONAL LENS, RICH CLUSTER]</i> | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.247,2.984; GS ACQ SCENARIO SINGLE | Prime + Parallel Group 1-2 in ACS/F814W-UVIS/F814W (8C) | 438 Secs (438 Secs) [==>] | [1] |
| | 2 | ANY | | WFC3/UVIS, ACCUM, UVIS | F814W | | | Prime + Parallel Group 1-2 in ACS/F814W-UVIS/F814W (8C) | 518 Secs (518 Secs) [==>] | [1] |
| | 3 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.494,3.078 | Prime + Parallel Group 3-4 in ACS/F814W-UVIS/F814W (8C) | 667 Secs (667 Secs) [==>] | [1] |
| | 4 | ANY | | WFC3/UVIS, ACCUM, UVIS | F814W | | | Prime + Parallel Group 3-4 in ACS/F814W-UVIS/F814W (8C) | 697 Secs (697 Secs) [==>] | [1] |
| | 5 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.371,3.216 | Prime + Parallel Group 5-6 in ACS/F814W-UVIS/F814W (8C) | 667 Secs (667 Secs) [==>] | [1] |
| | 6 | ANY | | WFC3/UVIS, ACCUM, UVIS | F814W | | | Prime + Parallel Group 5-6 in ACS/F814W-UVIS/F814W (8C) | 697 Secs (697 Secs) [==>] | [1] |
| | 7 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.123,3.122 | Prime + Parallel Group 7-8 in ACS/F814W-UVIS/F814W (8C) | 438 Secs (438 Secs) [==>] | [1] |
| | 8 | ANY | | WFC3/UVIS, ACCUM, UVIS | F814W | | | Prime + Parallel Group 7-8 in ACS/F814W-UVIS/F814W (8C) | 564 Secs (564 Secs) [==>] | [1] |



Proposal 15842 - IR/F110W-ACS/F814W (1A) - Unprecedented Spatial Resolution in a Strongly Magnified z ~ 6 Galaxy

Fri Jul 26 12:00:37 GMT 2019

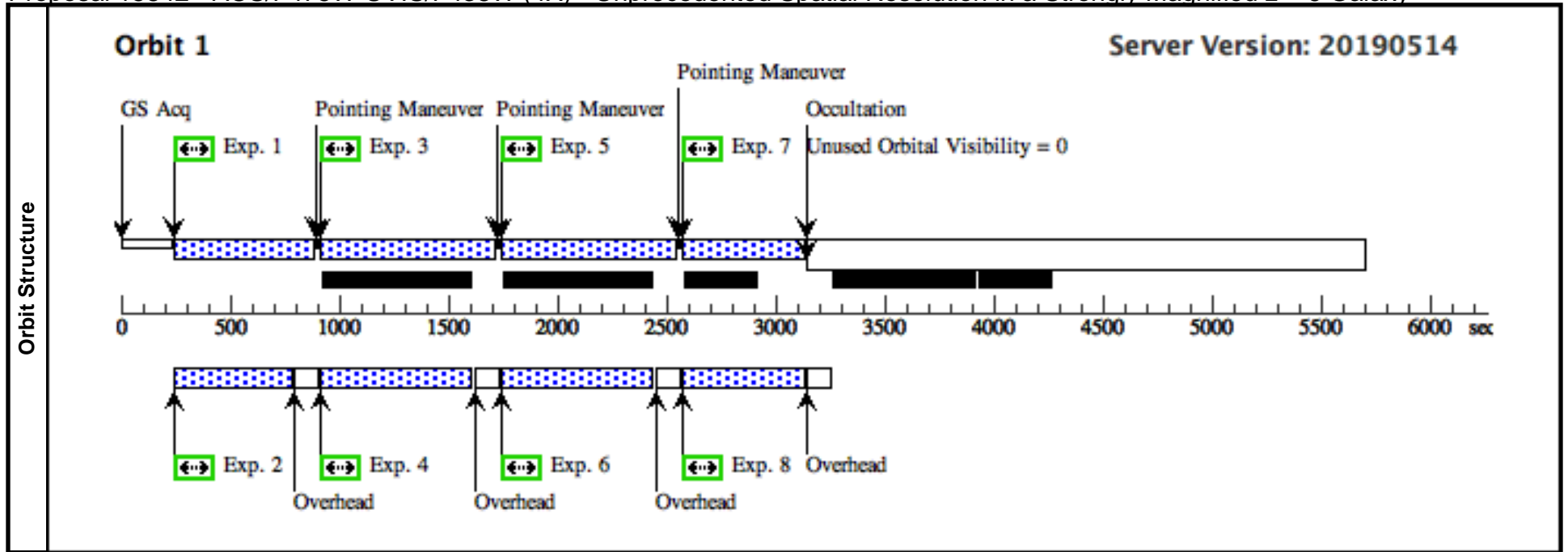
| Visit | Proposal 15842, IR/F110W-ACS/F814W (1A) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: ORIENT 50D TO 75 D | | | | | | | | | |
|-----------|--|--------------------|--|-----------------------------|--------------------------|--------------------------------|-----------------------|---|---|-------|
| | Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | |
| | (1) | WHL-J24.3324-8.477 | RA: 01 37 25.0000 (24.3541667d) Dec: -08 27 25.00 (-8.45694d) Equinox: J2000 | | V=18 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category= <i>CLUSTER OF GALAXIES</i> Description= <i>[GRAVITATIONAL LENS, RICH CLUSTER]</i> | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) WHL-J24.3324-8.477 | WFC3/IR, MULTIACCUM, IR-FIX | F110W | SAMP-SEQ=SPARS 50; NSAMP=14 | | Prime + Parallel Group 1-2 in IR/F110W-ACS/F814W (1A) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 2 | | ANY | ACS/WFC, ACCUM, WFCENTER | F814W | | | Prime + Parallel Group 1-2 in IR/F110W-ACS/F814W (1A) | 497 Secs (497 Secs) [==>] | [1] |
| | 3 | | (1) WHL-J24.3324-8.477 | WFC3/IR, MULTIACCUM, IR-FIX | F110W | SAMP-SEQ=SPARS 50; NSAMP=14 | POS TARG 0.542,0.182 | Prime + Parallel Group 3-4 in IR/F110W-ACS/F814W (1A) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 4 | | ANY | ACS/WFC, ACCUM, WFCENTER | F814W | | | Prime + Parallel Group 3-4 in IR/F110W-ACS/F814W (1A) | 557 Secs (557 Secs) [==>] | [1] |
| | 5 | | (1) WHL-J24.3324-8.477 | WFC3/IR, MULTIACCUM, IR-FIX | F110W | SAMP-SEQ=SPARS 50; NSAMP=14 | POS TARG 0.339,0.485 | Prime + Parallel Group 5-6 in IR/F110W-ACS/F814W (1A) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 6 | | ANY | ACS/WFC, ACCUM, WFCENTER | F814W | | | Prime + Parallel Group 5-6 in IR/F110W-ACS/F814W (1A) | 557 Secs (557 Secs) [==>] | [1] |
| | 7 | | (1) WHL-J24.3324-8.477 | WFC3/IR, MULTIACCUM, IR-FIX | F110W | SAMP-SEQ=SPARS 50; NSAMP=13 | POS TARG -0.203,0.303 | Prime + Parallel Group 7-8 in IR/F110W-ACS/F814W (1A) | 602.937703 Secs (602.938 Secs) [==>] | [1] |
| | 8 | | ANY | ACS/WFC, ACCUM, WFCENTER | F814W | | | Prime + Parallel Group 7-8 in IR/F110W-ACS/F814W (1A) | 507 Secs (507 Secs) [==>] | [1] |



Proposal 15842 - ACS/F475W-UVIS/F438W (4X) - Unprecedented Spatial Resolution in a Strongly Magnified z ~ 6 Galaxy

Fri Jul 26 12:00:37 GMT 2019

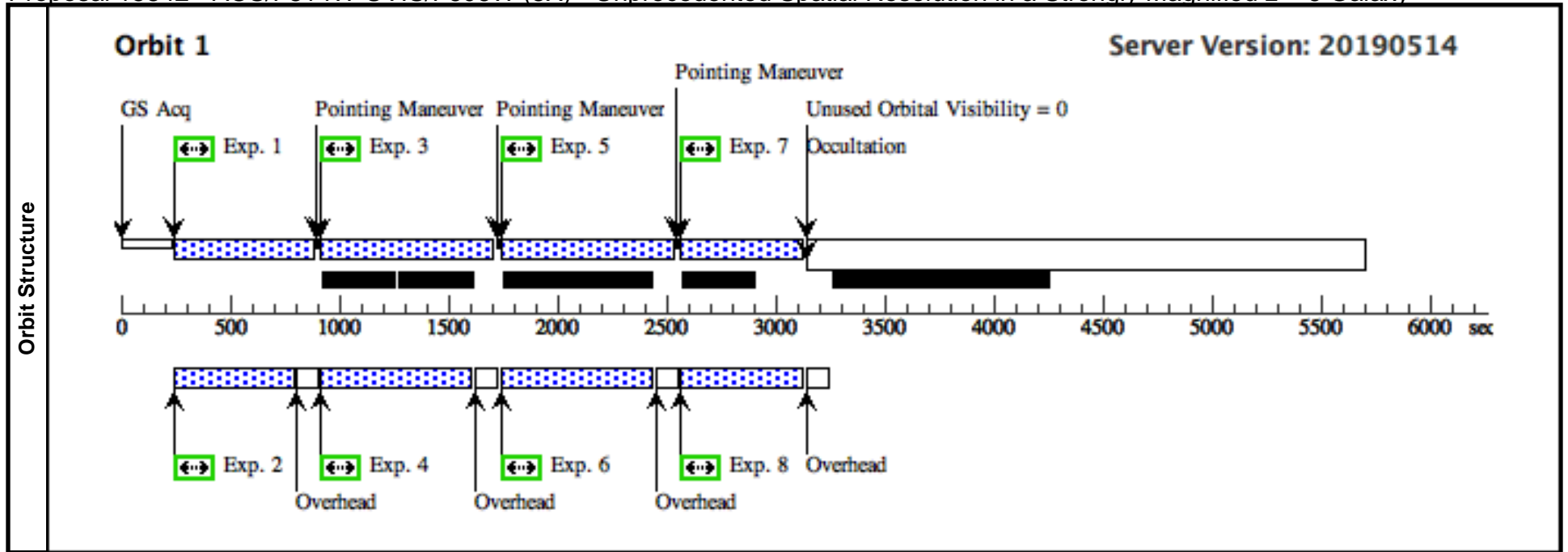
| Visit | Proposal 15842, ACS/F475W-UVIS/F438W (4X) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 4A; AFTER 4A BY 20 D TO 360 D | | | | | | | | | |
|-----------|--|--------------------|--|--------------------------|--------------------------|-----------------------|---|---|---------------------------------|-------|
| | Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | |
| | (1) | WHL-J24.3324-8.477 | RA: 01 37 25.0000 (24.3541667d) Dec: -08 27 25.00 (-8.45694d) Equinox: J2000 | | V=18 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category= <i>CLUSTER OF GALAXIES</i> Description= <i>[GRAVITATIONAL LENS, RICH CLUSTER]</i> | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F475W | | POS TARG 0.247,2.984; GS ACQ SCENARIO SINGLE | Prime + Parallel Group 1-2 in ACS/F475W-UVIS/F438W (4X) | 432 Secs (432 Secs) [==>] | [1] |
| | 2 | ANY | | WFC3/UVIS, ACCUM, UVIS | F438W | FLASH=9 | | Prime + Parallel Group 1-2 in ACS/F475W-UVIS/F438W (4X) | 506 Secs (506 Secs) [==>] | [1] |
| | 3 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F475W | | POS TARG 0.494,3.078 | Prime + Parallel Group 3-4 in ACS/F475W-UVIS/F438W (4X) | 673 Secs (673 Secs) [==>] | [1] |
| | 4 | ANY | | WFC3/UVIS, ACCUM, UVIS | F438W | FLASH=9 | | Prime + Parallel Group 3-4 in ACS/F475W-UVIS/F438W (4X) | 697 Secs (697 Secs) [==>] | [1] |
| | 5 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F475W | | POS TARG 0.371,3.216 | Prime + Parallel Group 5-6 in ACS/F475W-UVIS/F438W (4X) | 673 Secs (673 Secs) [==>] | [1] |
| | 6 | ANY | | WFC3/UVIS, ACCUM, UVIS | F438W | FLASH=9 | | Prime + Parallel Group 5-6 in ACS/F475W-UVIS/F438W (4X) | 697 Secs (697 Secs) [==>] | [1] |
| | 7 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F475W | | POS TARG 0.123,3.122 | Prime + Parallel Group 7-8 in ACS/F475W-UVIS/F438W (4X) | 432 Secs (432 Secs) [==>] | [1] |
| | 8 | ANY | | WFC3/UVIS, ACCUM, UVIS | F438W | FLASH=9 | | Prime + Parallel Group 7-8 in ACS/F475W-UVIS/F438W (4X) | 558 Secs (558 Secs) [==>] | [1] |



Proposal 15842 - ACS/F814W-UVIS/F606W (8X) - Unprecedented Spatial Resolution in a Strongly Magnified z ~ 6 Galaxy

Fri Jul 26 12:00:37 GMT 2019

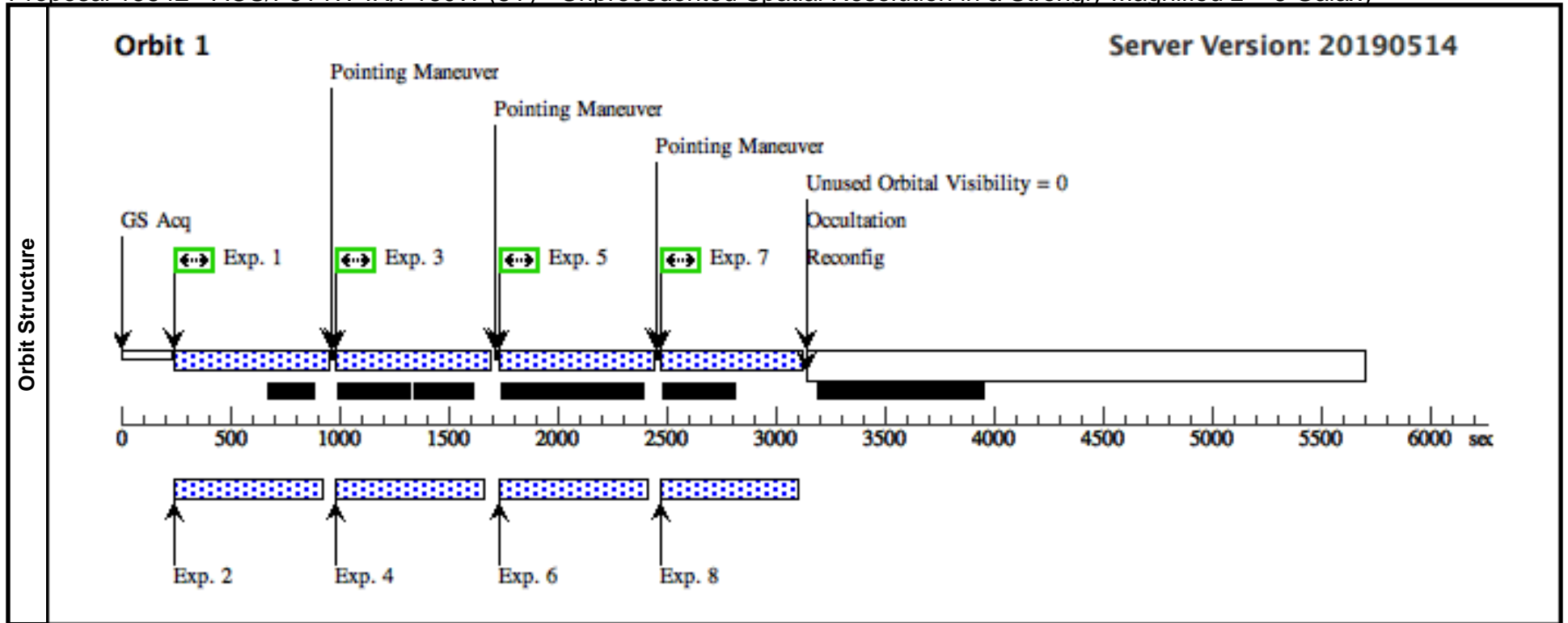
| Visit | Proposal 15842, ACS/F814W-UVIS/F606W (8X) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 4A; AFTER 8A BY 20 D TO 360 D | | | | | | | | | |
|-----------|--|--------------------|--|--------------------------|--------------------------|-----------------------|-------------------------|--|---------------------------------|-------|
| | Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | |
| | (1) | WHL-J24.3324-8.477 | RA: 01 37 25.0000 (24.3541667d) Dec: -08 27 25.00 (-8.45694d) Equinox: J2000 | | V=18 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category=CLUSTER OF GALAXIES Description=[GRAVITATIONAL LENS, RICH CLUSTER] | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | GS ACQ SCENARI O SINGLE | Prime + Parallel Group 1-2 in ACS/F814W-UVIS/F606W (8 X) | 438 Secs (438 Secs) [==>] | [1] |
| | 2 | | ANY | WFC3/UVIS, ACCUM, UVIS | F606W | | | Prime + Parallel Group 1-2 in ACS/F814W-UVIS/F606W (8 X) | 518 Secs (518 Secs) [==>] | [1] |
| | 3 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.247,0.094 | Prime + Parallel Group 3-4 in ACS/F814W-UVIS/F606W (8 X) | 667 Secs (667 Secs) [==>] | [1] |
| | 4 | | ANY | WFC3/UVIS, ACCUM, UVIS | F606W | | | Prime + Parallel Group 3-4 in ACS/F814W-UVIS/F606W (8 X) | 697 Secs (697 Secs) [==>] | [1] |
| | 5 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.124,0.232 | Prime + Parallel Group 5-6 in ACS/F814W-UVIS/F606W (8 X) | 667 Secs (667 Secs) [==>] | [1] |
| | 6 | | ANY | WFC3/UVIS, ACCUM, UVIS | F606W | | | Prime + Parallel Group 5-6 in ACS/F814W-UVIS/F606W (8 X) | 697 Secs (697 Secs) [==>] | [1] |
| | 7 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG -0.124,0.138 | Prime + Parallel Group 7-8 in ACS/F814W-UVIS/F606W (8 X) | 438 Secs (438 Secs) [==>] | [1] |
| | 8 | | ANY | WFC3/UVIS, ACCUM, UVIS | F606W | | | Prime + Parallel Group 7-8 in ACS/F814W-UVIS/F606W (8 X) | 564 Secs (564 Secs) [==>] | [1] |



Proposal 15842 - ACS/F814W-IR/F160W (8Y) - Unprecedented Spatial Resolution in a Strongly Magnified z ~ 6 Galaxy

Fri Jul 26 12:00:37 GMT 2019

| Visit | Proposal 15842, ACS/F814W-IR/F160W (8Y) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: SAME ORIENT AS 4A; AFTER 8B BY 20 D TO 360 D | | | | | | | | | |
|-----------|--|--------------------|--|-----------------------------|--------------------------|-----------------------|---|---|---|-------|
| | Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | |
| | (1) | WHL-J24.3324-8.477 | RA: 01 37 25.0000 (24.3541667d) Dec: -08 27 25.00 (-8.45694d) Equinox: J2000 | | V=18 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category=CLUSTER OF GALAXIES Description=[GRAVITATIONAL LENS, RICH CLUSTER] | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.247,2.984; GS ACQ SCENARIO SINGLE | Prime + Parallel Group 1-2 in ACS/F814W-IR/F160W (8Y) | 507 Secs (507 Secs) [==>] | [1] |
| | 2 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F160W | | SAMP-SEQ=SPARS 50; NSAMP=14 | Prime + Parallel Group 1-2 in ACS/F814W-IR/F160W (8Y) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 3 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.494,3.078 | Prime + Parallel Group 3-4 in ACS/F814W-IR/F160W (8Y) | 586 Secs (586 Secs) [==>] | [1] |
| | 4 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F160W | | SAMP-SEQ=SPARS 50; NSAMP=14 | Prime + Parallel Group 3-4 in ACS/F814W-IR/F160W (8Y) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 5 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.371,3.216 | Prime + Parallel Group 5-6 in ACS/F814W-IR/F160W (8Y) | 586 Secs (586 Secs) [==>] | [1] |
| | 6 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F160W | | SAMP-SEQ=SPARS 50; NSAMP=14 | Prime + Parallel Group 5-6 in ACS/F814W-IR/F160W (8Y) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 7 | | (1) WHL-J24.3324-8.477 | ACS/WFC, ACCUM, WFCENTER | F814W | | POS TARG 0.123,3.122 | Prime + Parallel Group 7-8 in ACS/F814W-IR/F160W (8Y) | 531 Secs (531 Secs) [==>] | [1] |
| | 8 | ANY | | WFC3/IR, MULTIACCUM, IR-FIX | F160W | | SAMP-SEQ=SPARS 50; NSAMP=13 | Prime + Parallel Group 7-8 in ACS/F814W-IR/F160W (8Y) | 602.937703 Secs (602.938 Secs) [==>] | [1] |



Proposal 15842 - IR/F110W-ACS/F435W (1X) - Unprecedented Spatial Resolution in a Strongly Magnified z ~ 6 Galaxy

Fri Jul 26 12:00:37 GMT 2019

| Visit | Proposal 15842, IR/F110W-ACS/F435W (1X) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: SAME ORIENT AS 1A; AFTER 1A BY 20 D TO 360 D | | | | | | | | | |
|-----------|--|--------------------|--|-----------------------------|--------------------------|--------------------------------|----------------------|---|---|-------|
| | Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | |
| | (1) | WHL-J24.3324-8.477 | RA: 01 37 25.0000 (24.3541667d) Dec: -08 27 25.00 (-8.45694d) Equinox: J2000 | | V=18 | Reference Frame: ICRS | | | | |
| | <i>Comments:</i> Category= <i>CLUSTER OF GALAXIES</i> Description= <i>[GRAVITATIONAL LENS, RICH CLUSTER]</i> | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (1) WHL-J24.3324-8.477 | WFC3/IR, MULTIACCUM, IR-FIX | F110W | SAMP-SEQ=SPARS 50; NSAMP=14 | POS TARG 7.317,0.908 | Prime + Parallel Group 1-2 in IR/F110W-ACS/F435W (1X) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 2 | | ANY | ACS/WFC, ACCUM, WFCENTER | F435W | | | Prime + Parallel Group 1-2 in IR/F110W-ACS/F435W (1X) | 497 Secs (497 Secs) [==>] | [1] |
| | 3 | | (1) WHL-J24.3324-8.477 | WFC3/IR, MULTIACCUM, IR-FIX | F110W | SAMP-SEQ=SPARS 50; NSAMP=14 | POS TARG 7.859,1.090 | Prime + Parallel Group 3-4 in IR/F110W-ACS/F435W (1X) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 4 | | ANY | ACS/WFC, ACCUM, WFCENTER | F435W | | | Prime + Parallel Group 3-4 in IR/F110W-ACS/F435W (1X) | 557 Secs (557 Secs) [==>] | [1] |
| | 5 | | (1) WHL-J24.3324-8.477 | WFC3/IR, MULTIACCUM, IR-FIX | F110W | SAMP-SEQ=SPARS 50; NSAMP=14 | POS TARG 7.656,1.393 | Prime + Parallel Group 5-6 in IR/F110W-ACS/F435W (1X) | 652.938154 Secs (652.938 Secs) [==>] | [1] |
| | 6 | | ANY | ACS/WFC, ACCUM, WFCENTER | F435W | | | Prime + Parallel Group 5-6 in IR/F110W-ACS/F435W (1X) | 557 Secs (557 Secs) [==>] | [1] |
| | 7 | | (1) WHL-J24.3324-8.477 | WFC3/IR, MULTIACCUM, IR-FIX | F110W | SAMP-SEQ=SPARS 50; NSAMP=13 | POS TARG 7.114,1.211 | Prime + Parallel Group 7-8 in IR/F110W-ACS/F435W (1X) | 602.937703 Secs (602.938 Secs) [==>] | [1] |
| | 8 | | ANY | ACS/WFC, ACCUM, WFCENTER | F435W | | | Prime + Parallel Group 7-8 in IR/F110W-ACS/F435W (1X) | 507 Secs (507 Secs) [==>] | [1] |

