



17916 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Cycle: 32, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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Proposal 17916 (STScI Edit Number: 1, Created: Monday, June 16, 2025, 9:00:34AM Eastern Standard Time) - Overview

<i>Name</i>	<i>Institution</i>
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Mr. Erik Zaborowski (CoI)	The Ohio State University
Prof. Sherry H. Suyu (CoI) (ESA Member)	Technical University of Munich
Prof. Xiaosheng Huang (CoI)	University of San Francisco
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Dr. Aleksandar Cikota (CoI)	NOIRLab - Gemini South (Chile)
Mr. Christopher Storfer (CoI)	University of Hawaii

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) J0316-4106	WFC3/IR	1	16-Jun-2025 10:00:28.0	yes
02	(2) DESIJ2321-0330	WFC3/IR	1	16-Jun-2025 10:00:28.0	yes
52	(2) DESIJ2321-0330	WFC3/IR	1	16-Jun-2025 10:00:28.0	yes
03	(3) PSJ0429+1428	WFC3/IR	1	16-Jun-2025 10:00:29.0	yes
04	(4) J0457-7820	WFC3/IR	1	16-Jun-2025 10:00:29.0	yes
05	(5) J0607-2152	WFC3/IR	1	16-Jun-2025 10:00:29.0	yes
06	(6) J0608+4229	WFC3/IR	1	16-Jun-2025 10:00:30.0	yes
07	(7) J0719+5255	WFC3/IR	1	16-Jun-2025 10:00:30.0	yes
08	(8) J0722-3901	WFC3/IR	1	16-Jun-2025 10:00:30.0	yes
09	(9) DECALSJ0756+0553	WFC3/IR	1	16-Jun-2025 10:00:31.0	yes
10	(10) J0803+3908	WFC3/IR	1	16-Jun-2025 10:00:31.0	yes
11	(11) J0833+2612	WFC3/IR	1	16-Jun-2025 10:00:31.0	yes
12	(12) DELVEJ1258-0319	WFC3/IR	1	16-Jun-2025 10:00:32.0	yes
13	(13) SDSSJ1640+1932	WFC3/IR	1	16-Jun-2025 10:00:32.0	yes
14	(14) GRALJ1651-0417	WFC3/IR	1	16-Jun-2025 10:00:32.0	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>
15	(15) J2017+6204	WFC3/IR	1	16-Jun-2025 10:00:33.0	yes
16	(16) GRALJ2103-0850	WFC3/IR	1	16-Jun-2025 10:00:33.0	yes
17	(17) DECALSJ2157-4201	WFC3/IR	1	16-Jun-2025 10:00:34.0	yes

18 Total Orbits Used

ABSTRACT

What's dark matter? What's the source of the "Hubble tension"? Is the stellar initial mass function universal? What's the structure of accretion disks? How do the correlations between quasar black hole mass and the properties of their host galaxies evolve over cosmic time? HST images of quadruply imaged quasars (quads) have been demonstrated to provide unique ways to address all these fundamental questions. Unfortunately, quads are very rare in the sky, and only a few tens are known. Thus, all the studies based on quads are limited in their precision by small number statistics, as only a subset can typically be used for each application, owing to the diversity of configurations. We propose to image 17 recently discovered quads with WFC3-IR to cement the HST legacy and build a bridge to the future, when 100-1000s of lenses will be known from Euclid/Rubin/Roman. WFC3-IR images are essential to detect the stellar light of the lens galaxy and the lensed QSO host. With its well known PSF WFC3-IR, this sample will be the foundation of future lens modeling with Roman and JWST. In the immediate future, this sample will enable, e.g., the determination of H_0 at $<2\%$ fully accounting for the mass sheet degeneracy; distinguishing Salpeter and Chabrier IMF at 99% CL for massive ellipticals, and detect a potential turnover in the subhalo mass function down to $10^{6.5}$ solar masses (corresponding to a thermal dark matter mass of 7.7 keV).

OBSERVING DESCRIPTION

We will obtain WFC3-IR F160W images of a sample of quadruply imaged quasar. We use a 4-point dither pattern, and STEP100 readout sequence to guarantee sufficient dynamic range to expose both the bright quasar and the host galaxy.

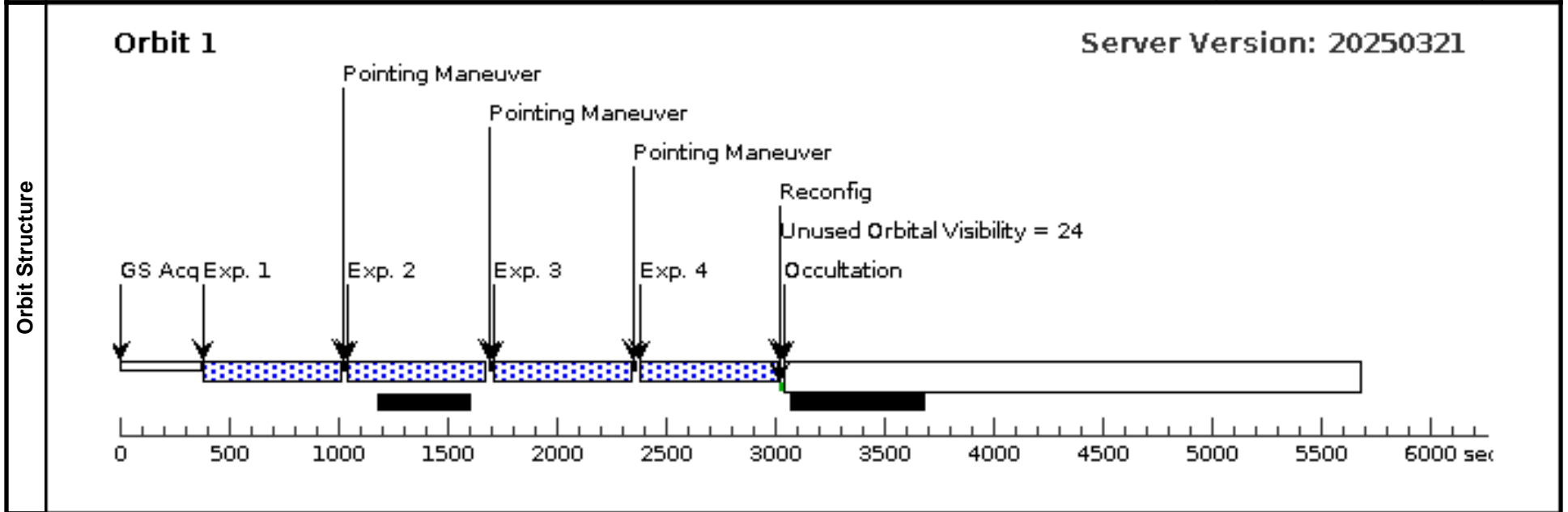
Proposal 17916 - Visit 01 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 01, completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	J0316-4106	RA: 03 16 0.7440 (49.0031000d) Dec: -41 06 9.72 (-41.10270d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	Category=GALAXY Description=[GRAVITATIONAL LENS]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) J0316-4106	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(1) J0316-4106	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(1) J0316-4106	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(1) J0316-4106	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		599.232292 Secs (599.232 Secs) [==>]	[1]



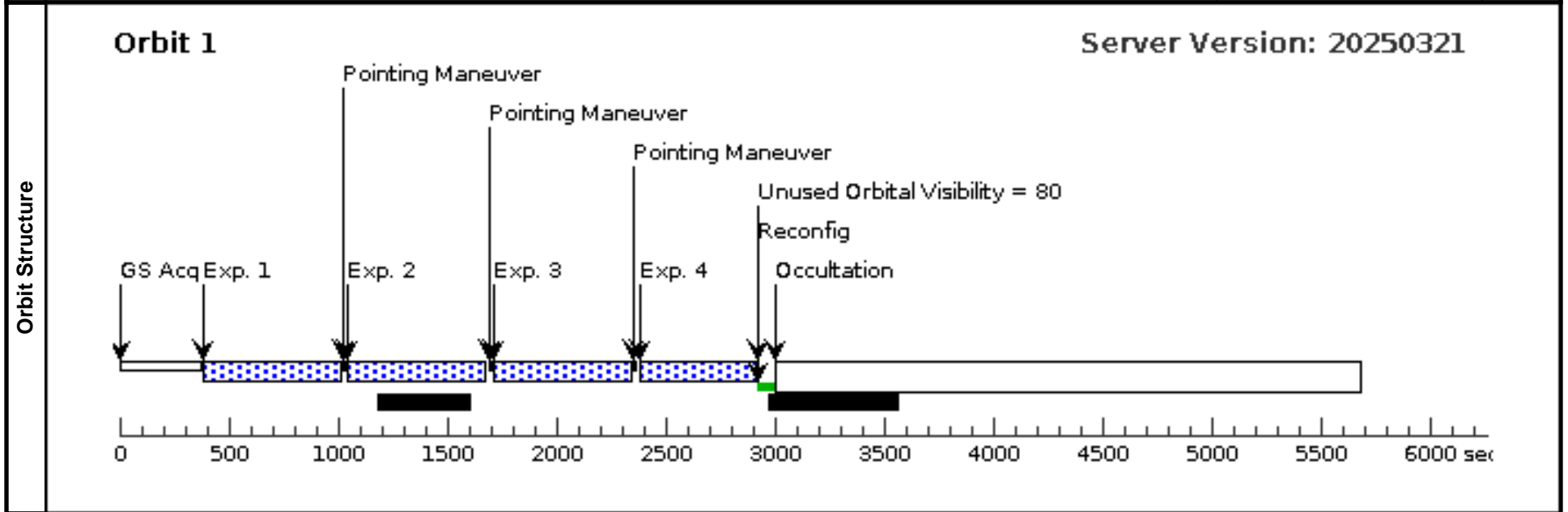
Proposal 17916 - Visit 02 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 02, failed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	DESIJ2321-0330	RA: 23 21 22.9900 (350.3457917d) Dec: -03 30 29.52 (-3.50820d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
<i>Comments:</i> Category=GALAXY Description=[GRAVITATIONAL LENS]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(2)	DESIJ2321-0330	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2	(2)	DESIJ2321-0330	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3	(2)	DESIJ2321-0330	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4	(2)	DESIJ2321-0330	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		499.231969 Secs (499.232 Secs) [==>]	[1]



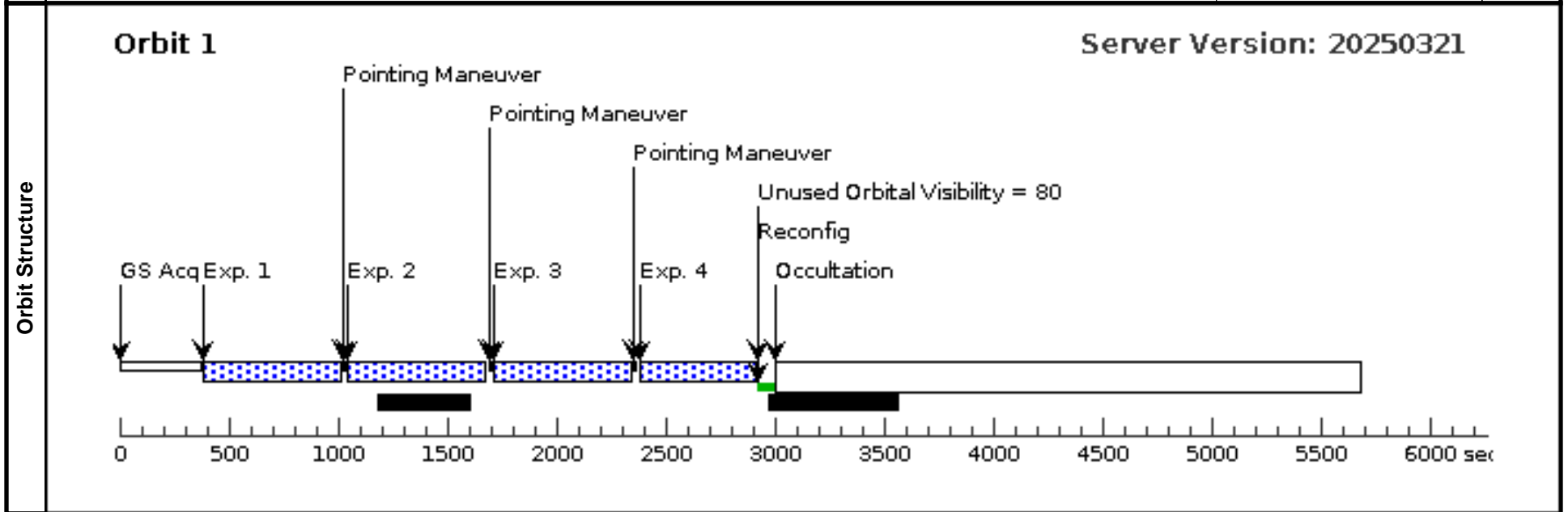
Proposal 17916 - Visit 52 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 52				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				
<i>Comments: HOPR repeat of visit 02.</i>					

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	DESIJ2321-0330	RA: 23 21 22.9900 (350.3457917d) Dec: -03 30 29.52 (-3.50820d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
<i>Comments: Category=GALAXY Description=[GRAVITATIONAL LENS]</i>						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(2)	DESIJ2321-0330	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2	(2)	DESIJ2321-0330	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3	(2)	DESIJ2321-0330	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4	(2)	DESIJ2321-0330	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		499.231969 Secs (499.232 Secs) [==>]	[1]



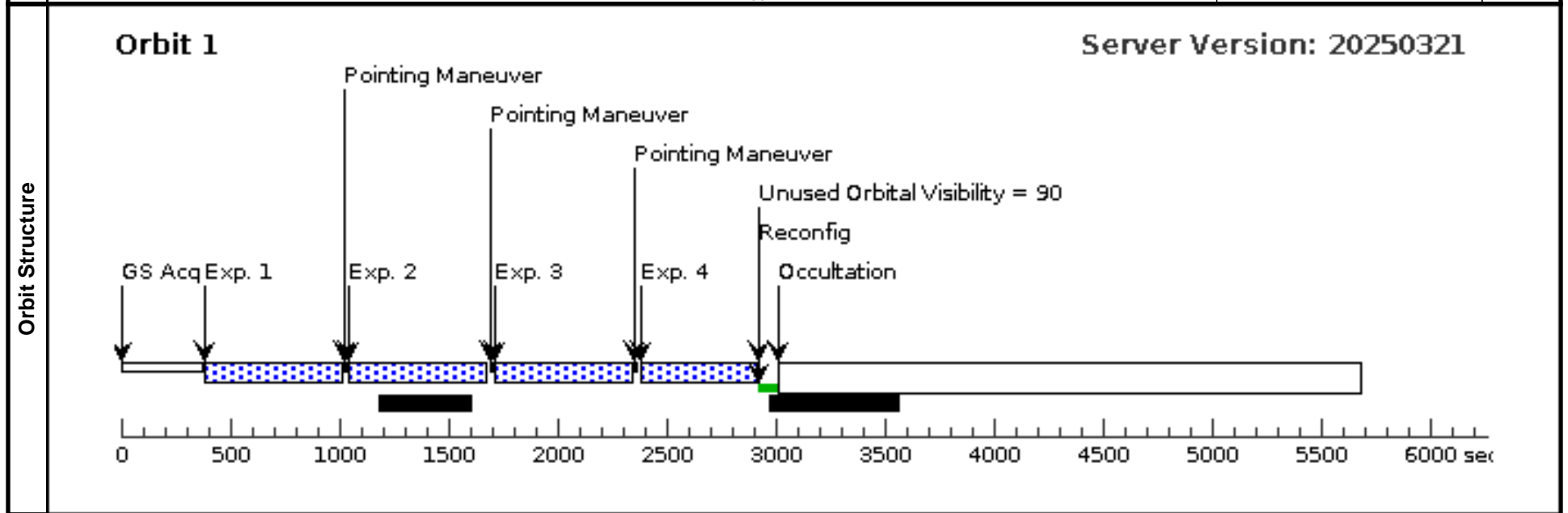
Proposal 17916 - Visit 03 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 03, scheduling				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(3)	PSJ0429+1428	RA: 04 29 13.1520 (67.3048000d) Dec: +14 28 40.44 (14.47790d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	Category=GALAXY Description=[GRAVITATIONAL LENS]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(3) PSJ0429+1428	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(3) PSJ0429+1428	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(3) PSJ0429+1428	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(3) PSJ0429+1428	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		499.231969 Secs (499.232 Secs) [==>]	[1]



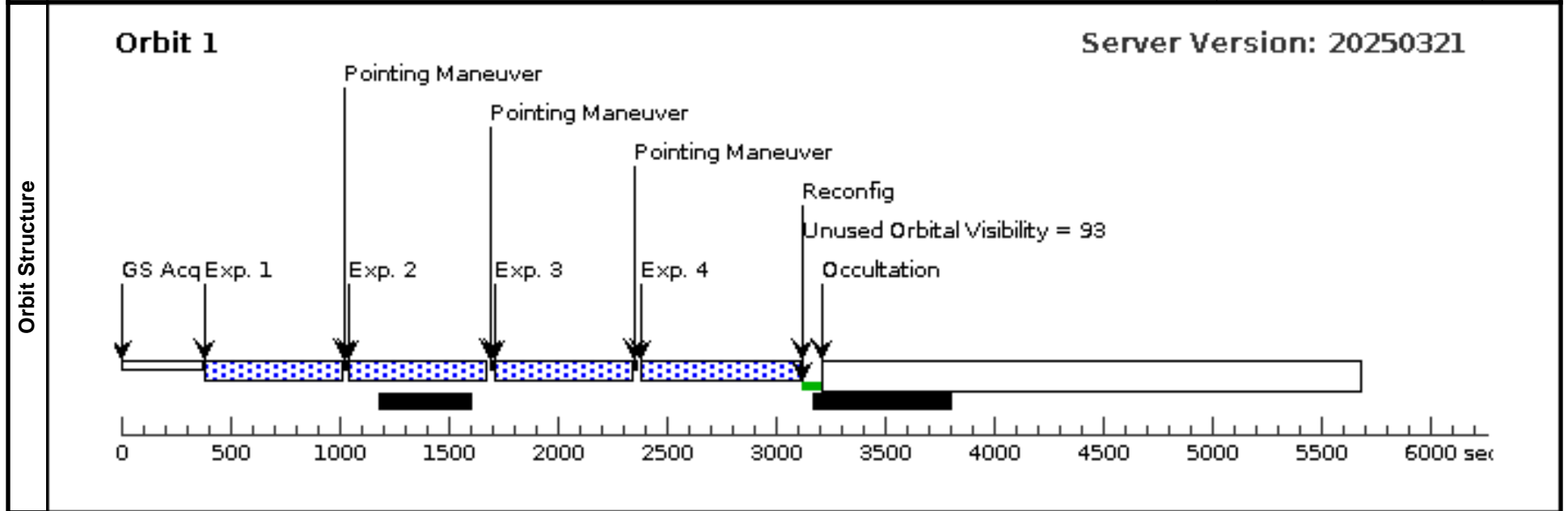
Proposal 17916 - Visit 04 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 04, completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(4)	J0457-7820	RA: 04 57 23.5920 (74.3483000d) Dec: -78 20 47.76 (-78.34660d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	Category=GALAXY Description=[GRAVITATIONAL LENS]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(4) J0457-7820	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(4) J0457-7820	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(4) J0457-7820	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(4) J0457-7820	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=13; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		699.232615 Secs (699.233 Secs) [==>]	[1]



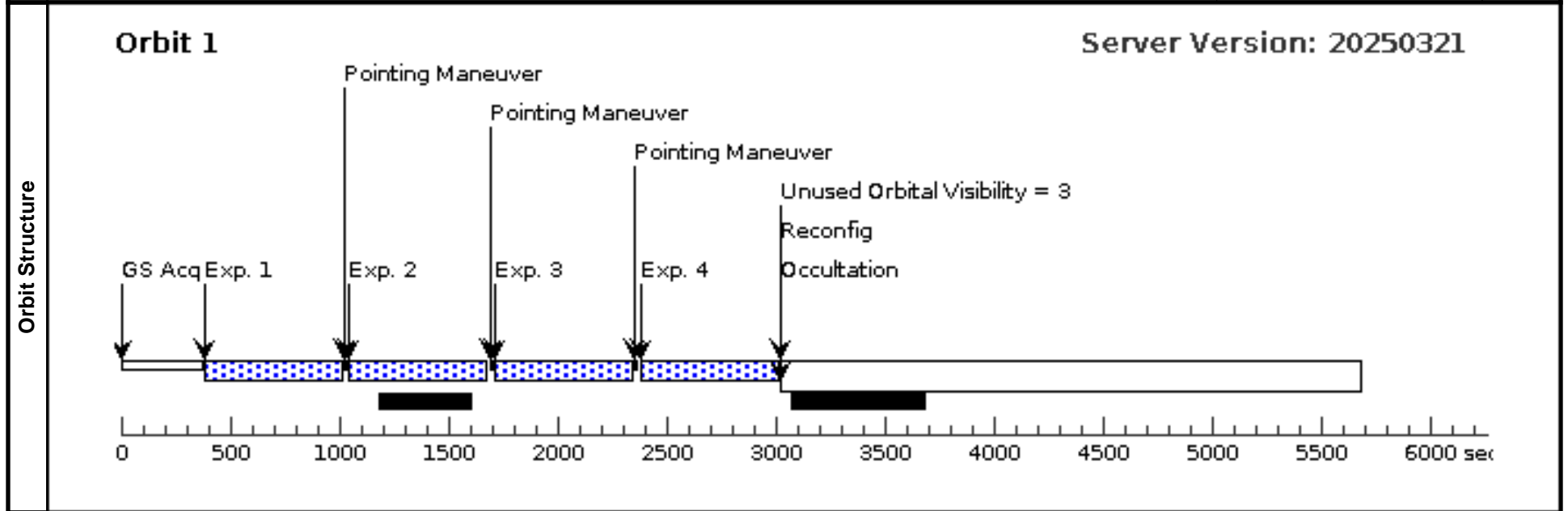
Proposal 17916 - Visit 05 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 05, scheduling				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(5)	J0607-2152	RA: 06 07 10.8960 (91.7954000d) Dec: -21 52 17.76 (-21.87160d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	<i>Category=GALAXY</i>					
	<i>Description=[GRAVITATIONAL LENS]</i>					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(5) J0607-2152	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(5) J0607-2152	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(5) J0607-2152	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(5) J0607-2152	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		599.232292 Secs (599.232 Secs) [==>]	[1]



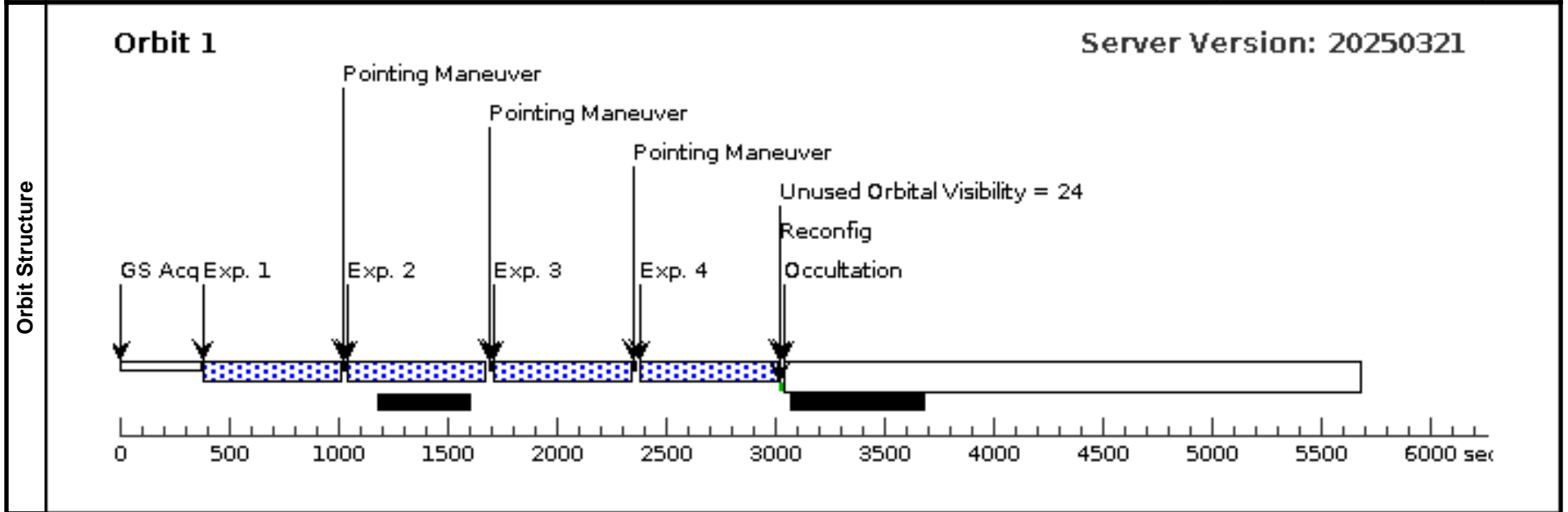
Proposal 17916 - Visit 06 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 06, scheduling				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(6)	J0608+4229	RA: 06 08 41.4000 (92.1725000d) Dec: +42 29 36.60 (42.49350d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	Category=GALAXY Description=[GRAVITATIONAL LENS]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(6) J0608+4229	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(6) J0608+4229	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(6) J0608+4229	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(6) J0608+4229	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		599.232292 Secs (599.232 Secs) [==>]	[1]



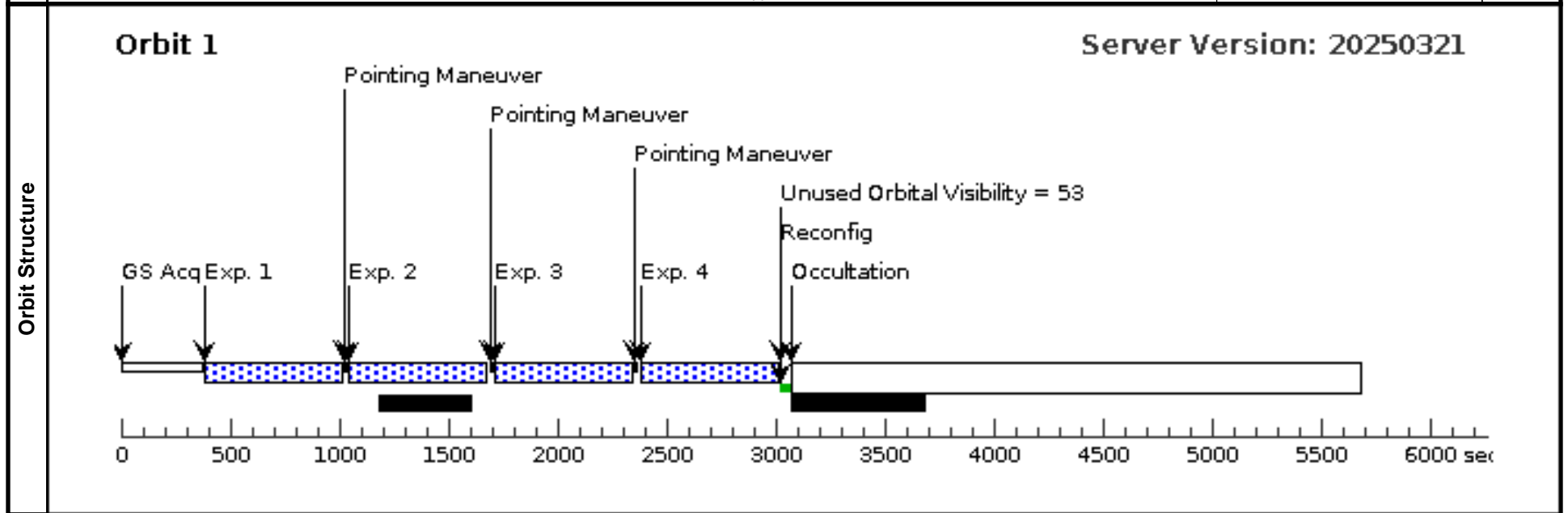
Proposal 17916 - Visit 07 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 07, scheduling				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(7)	J0719+5255	RA: 07 19 43.7760 (109.9324000d) Dec: +52 55 53.76 (52.93160d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	Category=GALAXY Description=[GRAVITATIONAL LENS]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(7) J0719+5255	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(7) J0719+5255	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(7) J0719+5255	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(7) J0719+5255	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		599.232292 Secs (599.232 Secs) [==>]	[1]



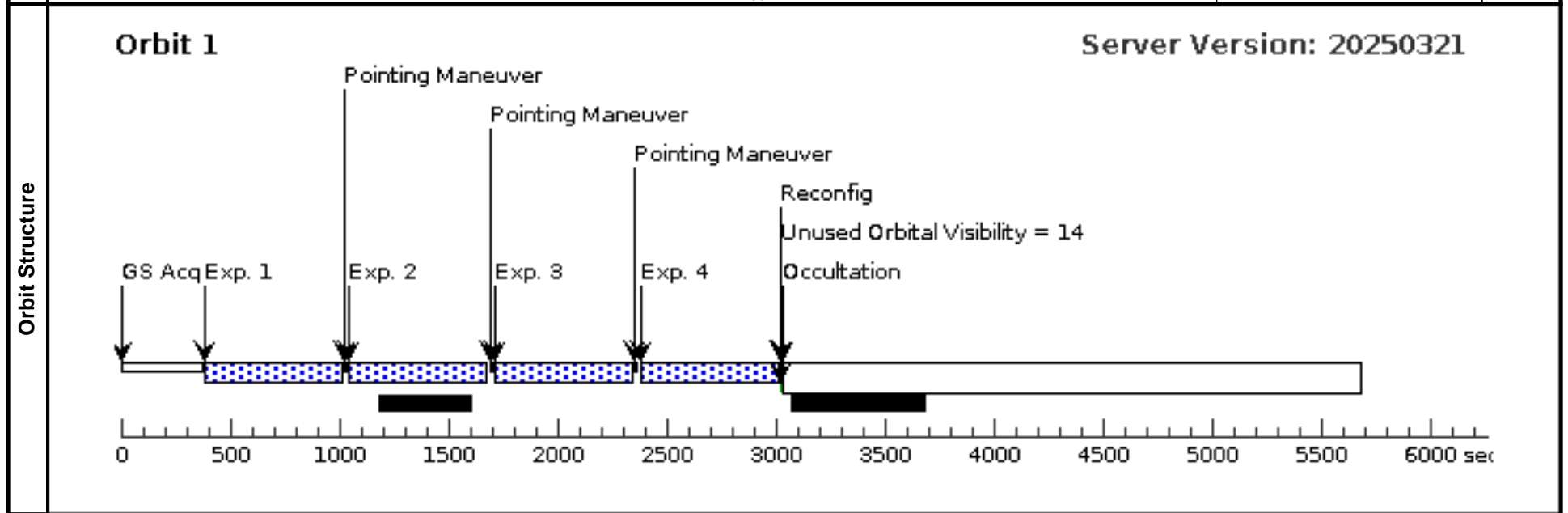
Proposal 17916 - Visit 08 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 08, completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(8)	J0722-3901	RA: 07 22 42.5760 (110.6774000d) Dec: -39 01 59.16 (-39.03310d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
<i>Comments:</i> Category=GALAXY Description=[GRAVITATIONAL LENS]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(8) J0722-3901	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(8) J0722-3901	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(8) J0722-3901	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(8) J0722-3901	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		599.232292 Secs (599.232 Secs) [==>]	[1]



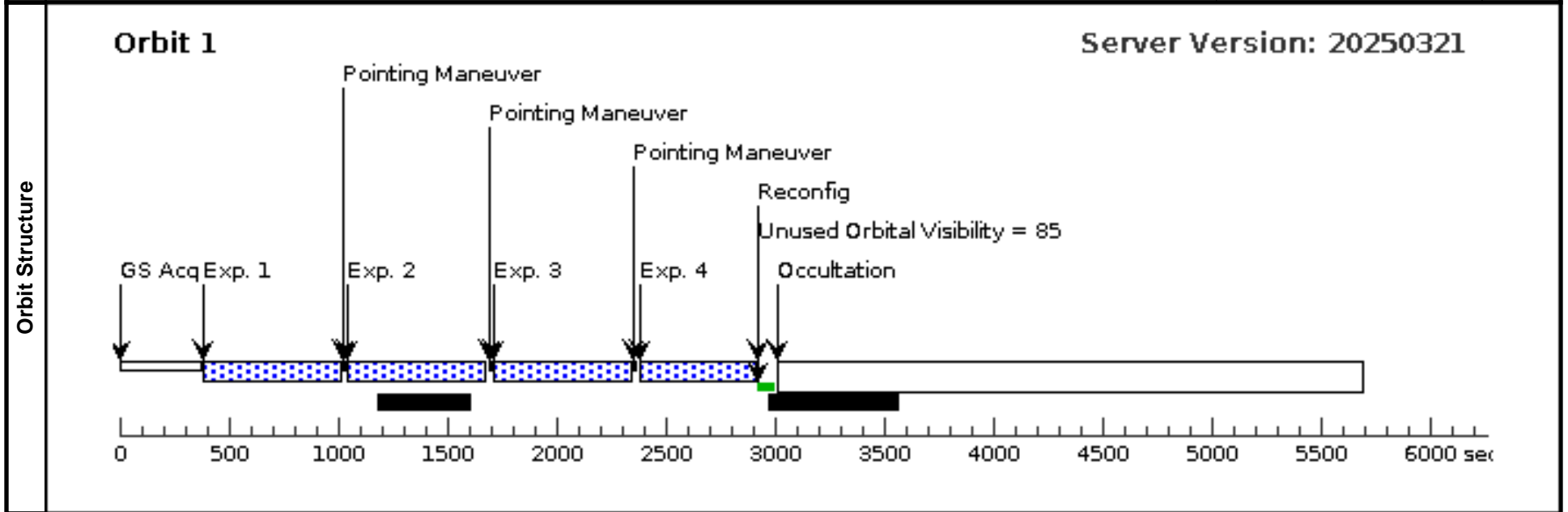
Proposal 17916 - Visit 09 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 09, scheduling				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(9)	DECALSJ0756+0553	RA: 07 56 31.5000 (119.1312500d) Dec: +05 53 15.65 (5.88768d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	Category=GALAXY Description=[GRAVITATIONAL LENS]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(9) DECALSJ0756+0553	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(9) DECALSJ0756+0553	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 5.962,2.002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(9) DECALSJ0756+0553	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 3.729,5.335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(9) DECALSJ0756+0553	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP100	POS TARG -2.233,3.333		499.231969 Secs (499.232 Secs) [==>]	[1]



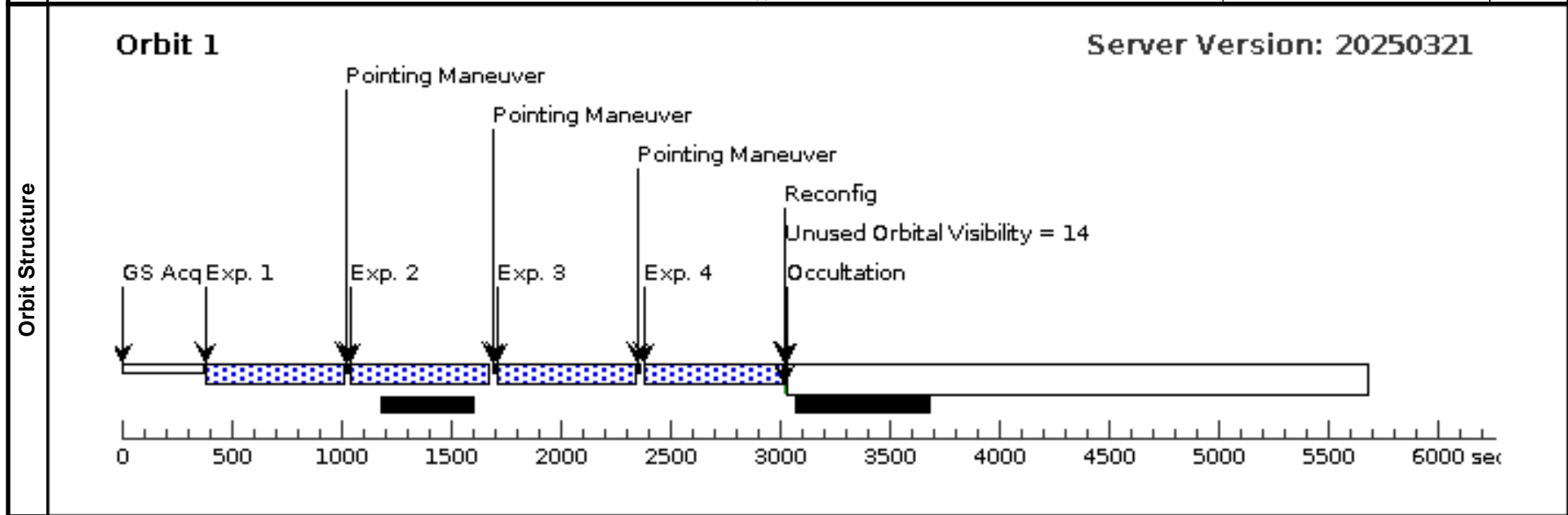
Proposal 17916 - Visit 10 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 10, scheduling				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(10)	J0803+3908	RA: 08 03 57.7440 (120.9906000d) Dec: +39 08 23.28 (39.13980d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	Category=GALAXY Description=[GRAVITATIONAL LENS]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(10) J0803+3908	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(10) J0803+3908	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(10) J0803+3908	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(10) J0803+3908	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		599.232292 Secs (599.232 Secs) [==>]	[1]



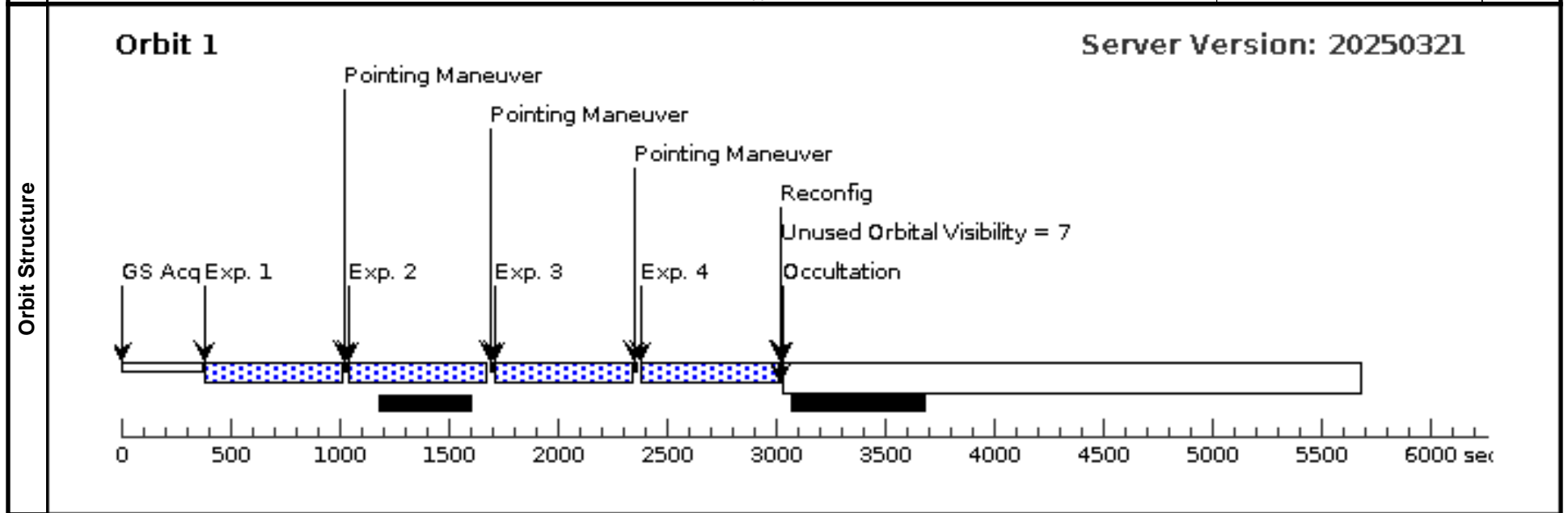
Proposal 17916 - Visit 11 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:34 GMT 2025

Visit	Proposal 17916, Visit 11, scheduling				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(11)	J0833+2612	RA: 08 33 54.4080 (128.4767000d) Dec: +26 12 10.44 (26.20290d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	<i>Category=GALAXY</i>					
	<i>Description=[GRAVITATIONAL LENS]</i>					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(11) J0833+2612	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(11) J0833+2612	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(11) J0833+2612	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(11) J0833+2612	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		599.232292 Secs (599.232 Secs) [==>]	[1]



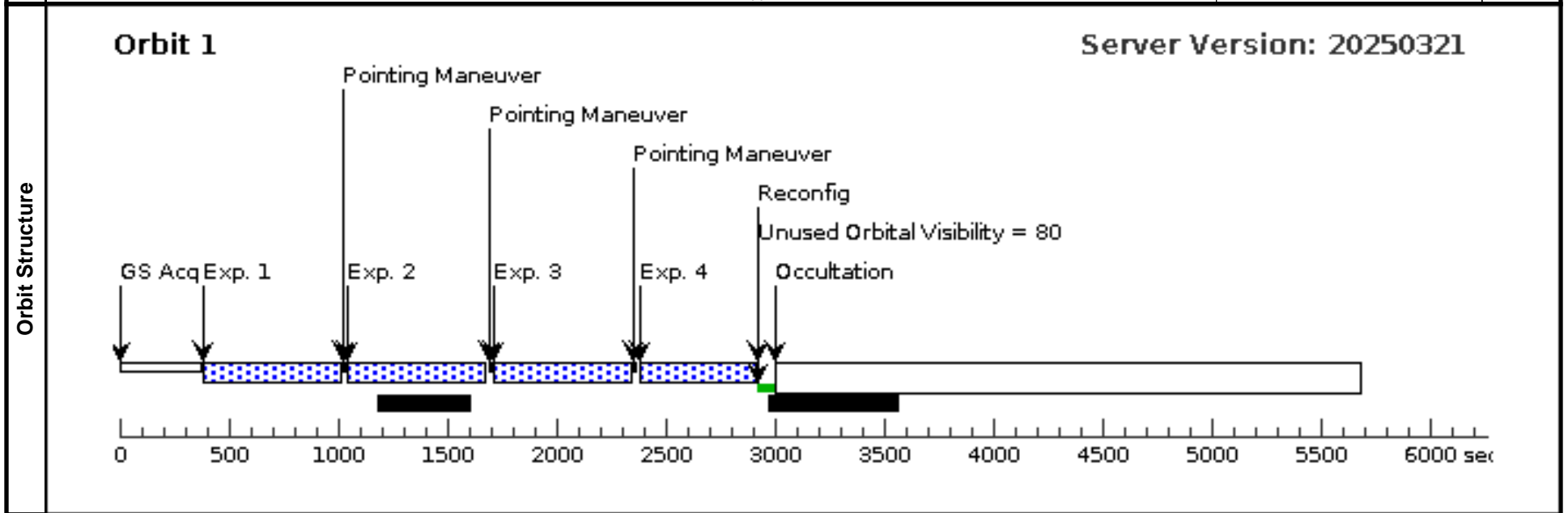
Proposal 17916 - Visit 12 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:35 GMT 2025

Visit	Proposal 17916, Visit 12, scheduling				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(12)	DELVEJ1258-0319	RA: 12 58 56.3280 (194.7347000d) Dec: -03 19 44.04 (-3.32890d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
<i>Comments:</i> Category=GALAXY Description=[GRAVITATIONAL LENS]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
		1		(12) DELVEJ1258-0319	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]
2			(12) DELVEJ1258-0319	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 5.962,2.002		599.232292 Secs (599.232 Secs) [==>]	[1]
3			(12) DELVEJ1258-0319	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 3.729,5.335		599.232292 Secs (599.232 Secs) [==>]	[1]
4			(12) DELVEJ1258-0319	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP100	POS TARG -2.233,3.333		499.231969 Secs (499.232 Secs) [==>]	[1]



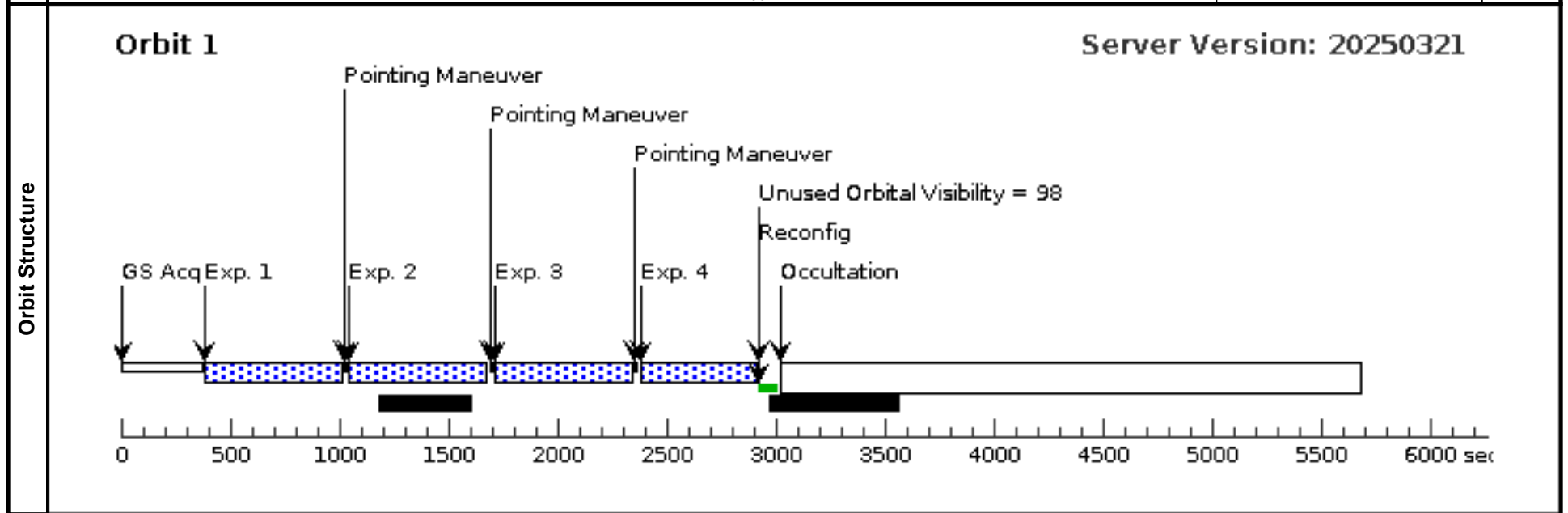
Proposal 17916 - Visit 13 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:35 GMT 2025

Visit	Proposal 17916, Visit 13, completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(13)	SDSSJ1640+1932	RA: 16 40 45.6696 (250.1902900d) Dec: +19 32 57.16 (19.54921d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	<i>Category=GALAXY</i>					
	<i>Description=[GRAVITATIONAL LENS]</i>					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(13) SDSSJ1640+1932	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(13) SDSSJ1640+1932	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 5.962,2.002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(13) SDSSJ1640+1932	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 3.729,5.335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(13) SDSSJ1640+1932	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP100	POS TARG -2.233,3.333		499.231969 Secs (499.232 Secs) [==>]	[1]



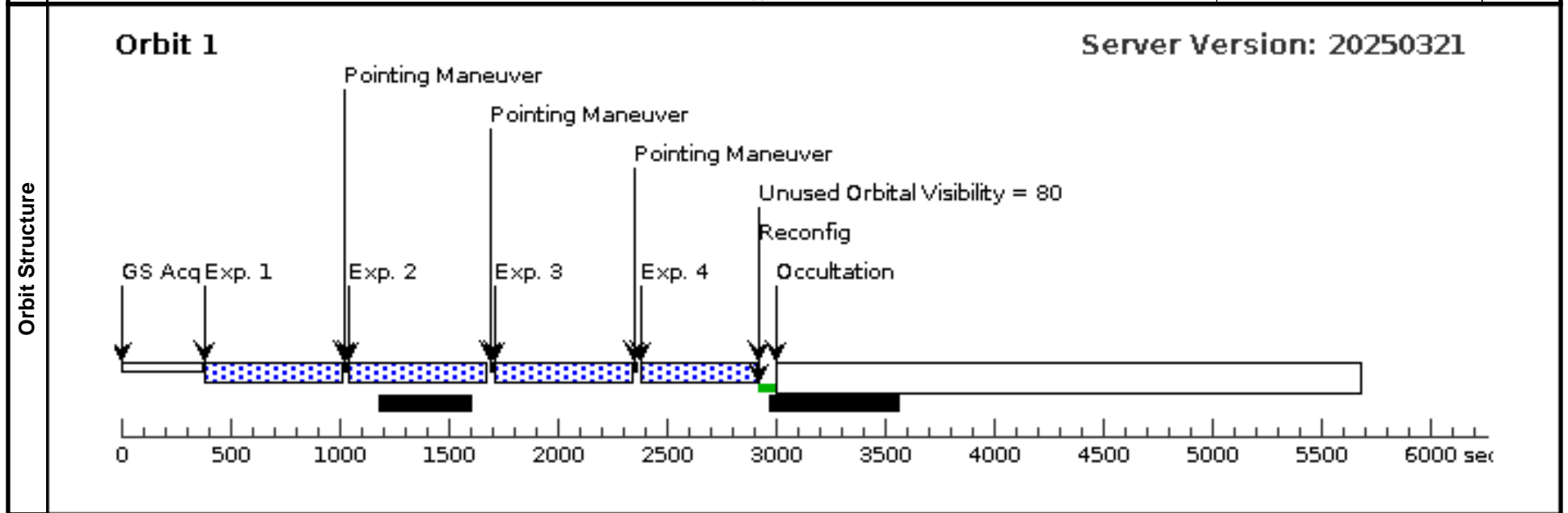
Proposal 17916 - Visit 14 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:35 GMT 2025

Visit	Proposal 17916, Visit 14, completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(14)	GRALJ1651-0417	RA: 16 51 5.2800 (252.7720000d) Dec: -04 17 24.97 (-4.29027d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i> Category=GALAXY Description=[GRAVITATIONAL LENS]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(14) GRALJ1651-0417	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(14) GRALJ1651-0417	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 5.962,2.002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(14) GRALJ1651-0417	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 3.729,5.335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(14) GRALJ1651-0417	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP100	POS TARG -2.233,3.333		499.231969 Secs (499.232 Secs) [==>]	[1]



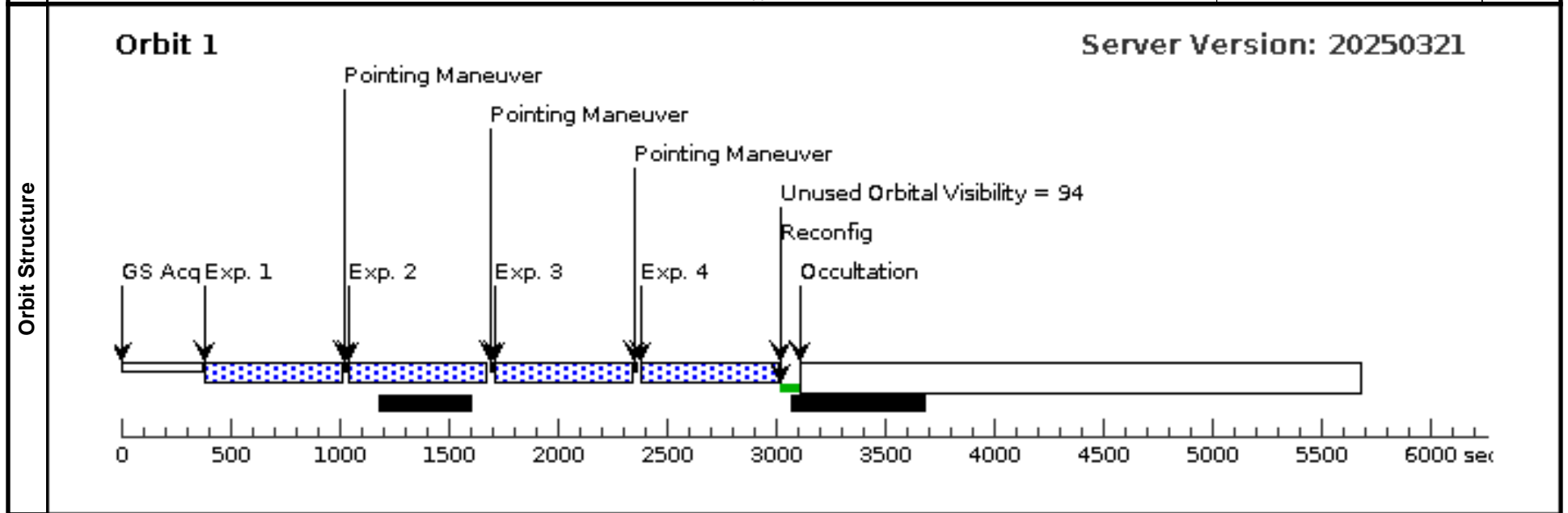
Proposal 17916 - Visit 15 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:35 GMT 2025

Visit	Proposal 17916, Visit 15, completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(15)	J2017+6204	RA: 20 17 49.0560 (304.4544000d) Dec: +62 04 43.32 (62.07870d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	<i>Category=GALAXY</i>					
	<i>Description=[GRAVITATIONAL LENS]</i>					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(15) J2017+6204	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(15) J2017+6204	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 5.962,2. 002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(15) J2017+6204	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG 3.729,5. 335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(15) J2017+6204	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP1 00	POS TARG -2.233,3 .333		599.232292 Secs (599.232 Secs) [==>]	[1]



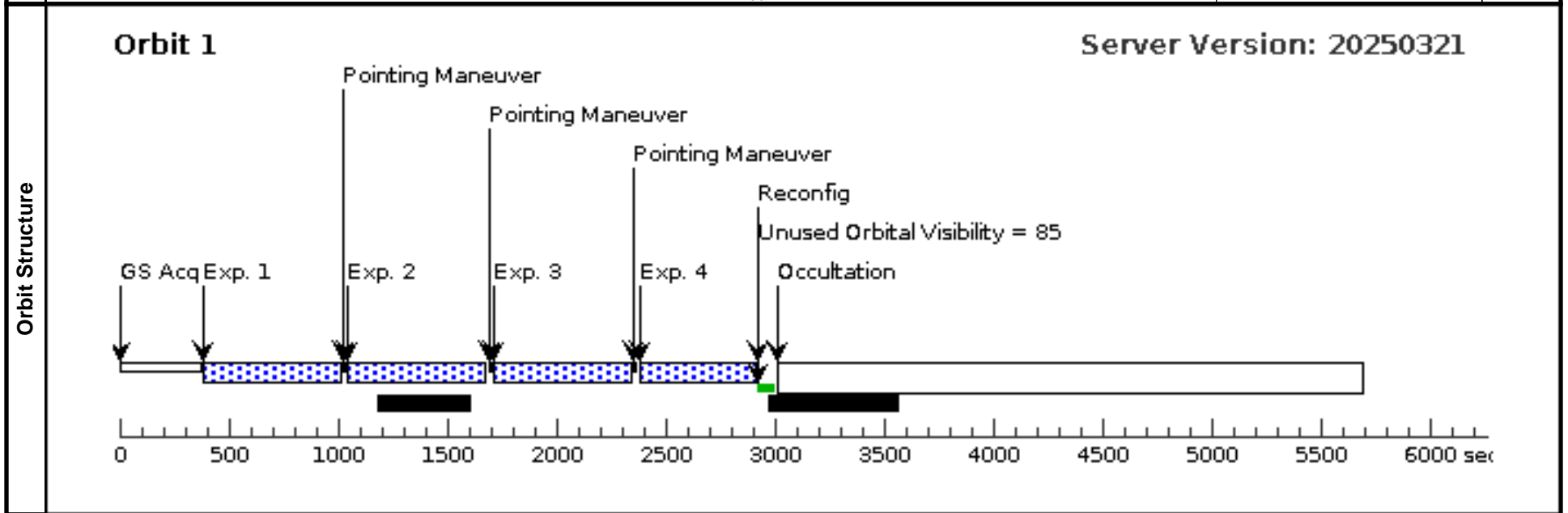
Proposal 17916 - Visit 16 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:35 GMT 2025

Visit	Proposal 17916, Visit 16, completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(16)	GRALJ2103-0850	RA: 21 03 28.9920 (315.8708000d) Dec: -08 50 48.98 (-8.84694d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
	<i>Comments:</i>					
	<i>Category=GALAXY</i>					
	<i>Description=[GRAVITATIONAL LENS]</i>					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(16) GRALJ2103-0850	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]	[1]
	2		(16) GRALJ2103-0850	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 5.962,2.002		599.232292 Secs (599.232 Secs) [==>]	[1]
	3		(16) GRALJ2103-0850	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 3.729,5.335		599.232292 Secs (599.232 Secs) [==>]	[1]
	4		(16) GRALJ2103-0850	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=STEP100	POS TARG -2.233,3.333		499.231969 Secs (499.232 Secs) [==>]	[1]



Proposal 17916 - Visit 17 - Dark matter, the Hubble tension, and the stellar IMF from HST imaging of quadruply imaged quasars

Mon Jun 16 14:00:35 GMT 2025

Visit	Proposal 17916, Visit 17, completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(17)	DECALSJ2157-4201	RA: 21 57 13.5360 (329.3064000d) Dec: -42 01 49.44 (-42.03040d) Equinox: J2000		V=20+/-0.5	Reference Frame: SDSS
<i>Comments:</i> Category=GALAXY Description=[GRAVITATIONAL LENS]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
		1		(17) DECALSJ2157-4201	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 0.0,0.0		599.232292 Secs (599.232 Secs) [==>]
2			(17) DECALSJ2157-4201	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 5.962,2.002		599.232292 Secs (599.232 Secs) [==>]	[1]
3			(17) DECALSJ2157-4201	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG 3.729,5.335		599.232292 Secs (599.232 Secs) [==>]	[1]
4			(17) DECALSJ2157-4201	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=12; SAMP-SEQ=STEP100	POS TARG -2.233,3.333		599.232292 Secs (599.232 Secs) [==>]	[1]

