17454 - A candidate nearly-dark galaxy with 4 globular clusters

Cycle: 31, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
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Prof. Gwendolyn Marie Eadie (CoI) (CSA Member)	University of Toronto
Prof. Aaron Romanowsky (CoI)	San Jose State Univ. Research Foundation

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) CDG-1	WFC3/UVIS	2	12-Sep-2023 07:00:24.0	yes
02	(1) CDG-1	WFC3/UVIS	2	12-Sep-2023 07:00:24.0	yes
03	(1) CDG-1	WFC3/UVIS	2	12-Sep-2023 07:00:25.0	yes

6 Total Orbits Used

ABSTRACT

CDG-1 is a recently-discovered system that may have the most extreme properties yet seen for a low surface brightness dwarf galaxy. An HST imaging survey of the Perseus cluster revealed a tight clump of 4 apparent globular clusters, indicating the presence of a galaxy, but no associated diffuse light. The probability that this grouping occurred by chance is less than 1 in 10^6. CDG-1 may represent the most extreme known case of a galaxy that experienced strong early feedback, driven by the young clusters themselves, that prevented subsequent star formation. In most formation

scenarios at least some diffuse star light is expected, and here we propose a sensitive search between the globular clusters using the efficient F200LP filter of UVIS. A detection of diffuse light would demonstrate that CDG-1 is indeed a galaxy, with at least ~95% of its luminosity in the form of globular clusters. The separations between the clusters are only 1-2 arcsec, which makes it impossible to do this program from the ground.

OBSERVING DESCRIPTION

The object will be observed with 4 dithered exposures in 2 orbits per visit. Each of the 3 visits is identical, for a total of 6 orbits and 12 exposures.

The size of the object is 2"-3", and the dither box size is 13". This makes it possible to construct and subtract the local background, while staying far enough away from a very bright star.

No post-flash is needed as the F200LP filter provides more than enough counts per exposure.

Visit

Proposal 17454, Visit 01

Tue Sep 12 11:00:25 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=BACKGROUND Number Of Points=4 Point Spacing=13 Line Spacing=13	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

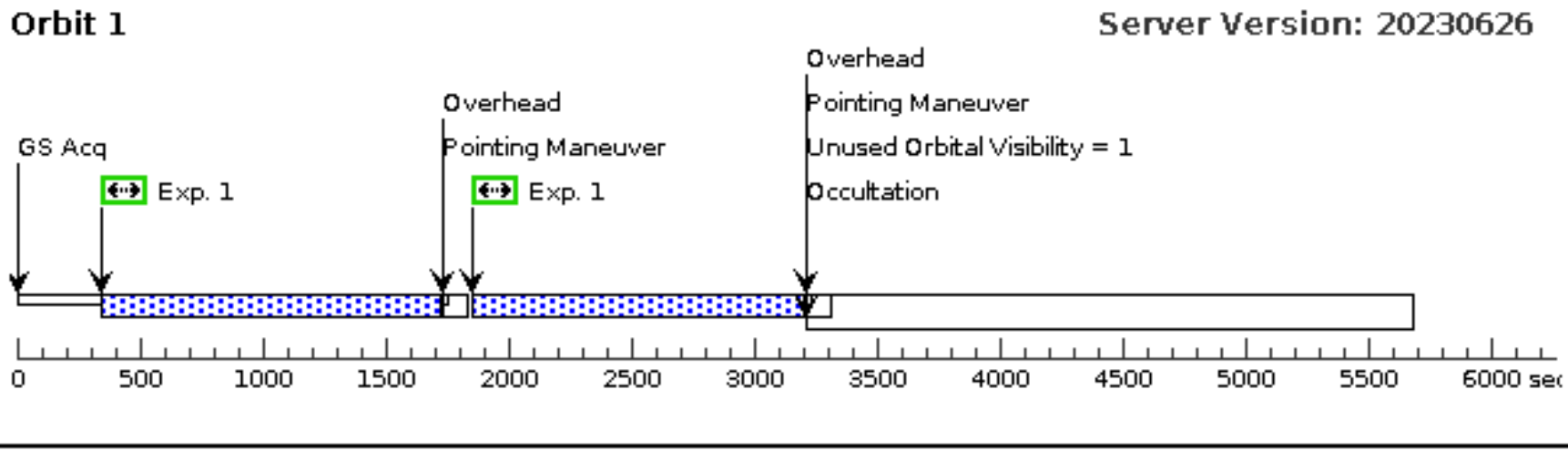
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	CDG-1	RA: 03 18 12.2500 (49.5510417d) Dec: +41 45 53.50 (41.76486d) Equinox: J2000		V=25	Reference Frame: ICRS

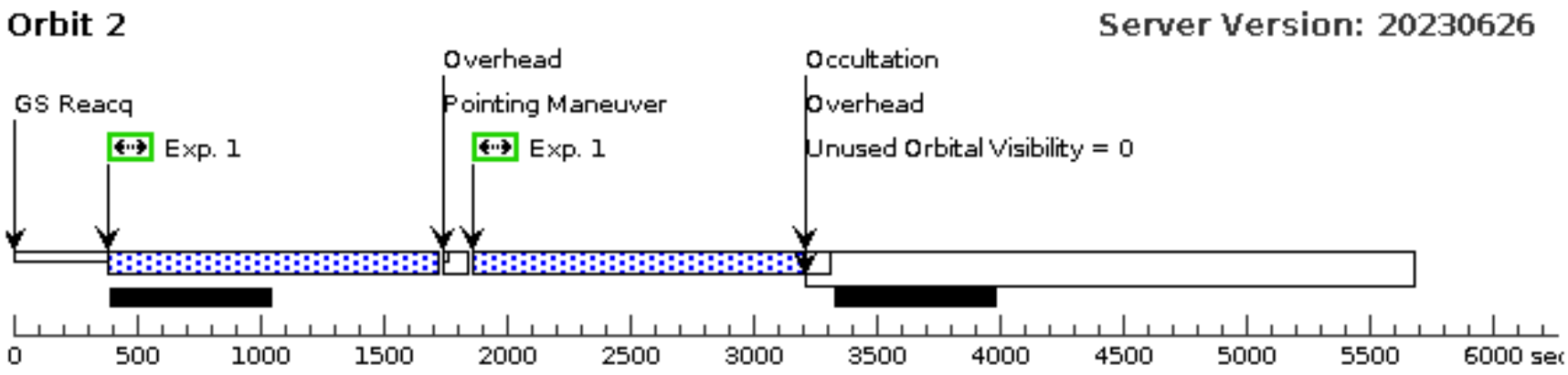
Comments:
Category=GALAXY
Description=[UNDESIGNATED]
Extended=YES

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) CDG-1	WFC3/UVIS, ACCUM, UVIS2	F200LP			Pattern 1, Exps 1-1 in Visit 01 (1)	1000 Secs (5384 Secs)	
								[==>1348.0 Secs (Pattern 1)] *[==>1348.0 Secs (Pattern 2)]*	***[1]***
								[==>1344.0 Secs (Pattern 3)] *[==>1344.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 17454, Visit 02

Tue Sep 12 11:00:25 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=BACKGROUND Number Of Points=4 Point Spacing=13 Line Spacing=13	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

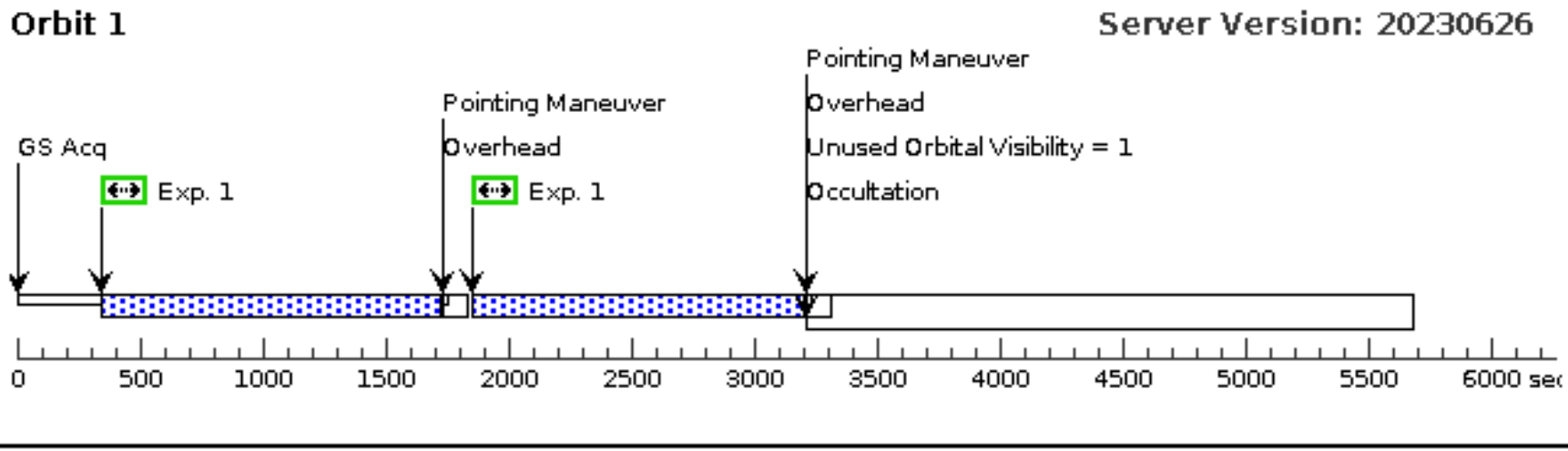
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	CDG-1	RA: 03 18 12.2500 (49.5510417d) Dec: +41 45 53.50 (41.76486d) Equinox: J2000		V=25	Reference Frame: ICRS

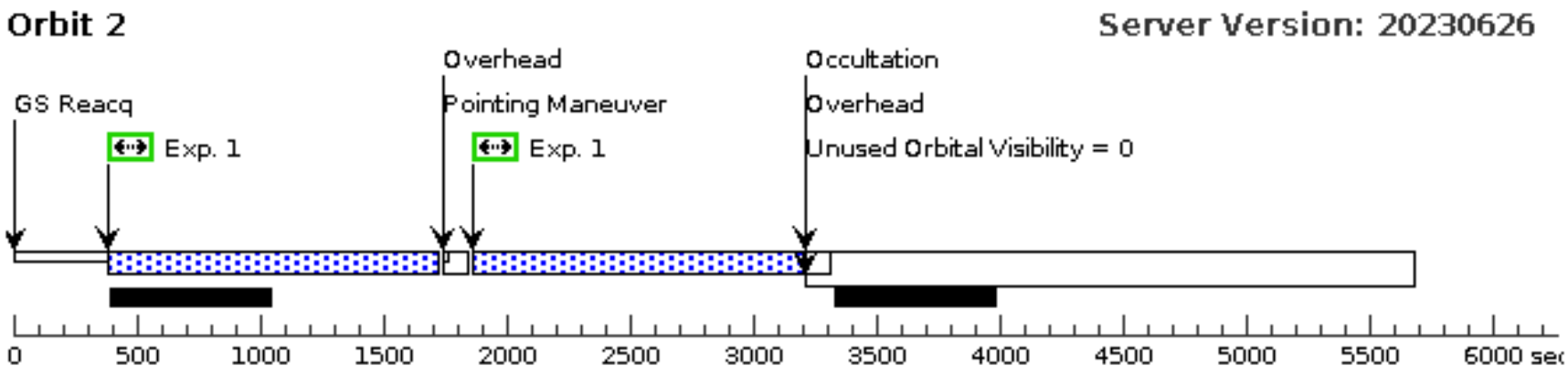
Comments:
Category=GALAXY
Description=[UNDESIGNATED]
Extended=YES

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) CDG-1	WFC3/UVIS, ACCUM, UVIS2	F200LP			Pattern 1, Exps 1-1 in Visit 02 (1)	1000 Secs (5384 Secs)	
								[==>1348.0 Secs (Pattern 1)] *[==>1348.0 Secs (Pattern 2)]*	***[1]***
								[==>1344.0 Secs (Pattern 3)] *[==>1344.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 17454, Visit 03

Tue Sep 12 11:00:25 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=BACKGROUND Number Of Points=4 Point Spacing=13 Line Spacing=13	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	CDG-1	RA: 03 18 12.2500 (49.5510417d) Dec: +41 45 53.50 (41.76486d) Equinox: J2000		V=25	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[UNDESIGNATED]
Extended=YES

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) CDG-1	WFC3/UVIS, ACCUM, UVIS2	F200LP			Pattern 1, Exps 1-1 in Visit 03 (1)	1000 Secs (5384 Secs)	
								[==>1348.0 Secs (Pattern 1)] *[==>1348.0 Secs (Pattern 2)]*	***[1]***
								[==>1344.0 Secs (Pattern 3)] *[==>1344.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure