14846 - Ultra-diffuse Galaxies in Clusters and the Field: Masses and Stellar Populations

Cycle: 24, 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) DGSAT-I	ACS/WFC	2	22-Jun-2017 21:05:15.0	yes
02	(2) R-127-1	ACS/WFC	2	22-Jun-2017 21:05:17.0	yes
03	(3) M-161-1	ACS/WFC	2	22-Jun-2017 21:05:18.0	yes
52	(2) R-127-1	ACS/WFC	2	22-Jun-2017 21:05:20.0	yes

8 Total Orbits Used

ABSTRACT

Ultra-diffuse galaxies (UDGs) were recognized only last year as a novel class of galaxies, with luminosities like dwarfs but sizes like giants. Although some UDGs appear to be just unusually extended dwarfs, others show evidence of being very different and unexpected: their dark matter

halos are overmassive by factors of ~10, with one UDG even being arguably a "failed Milky Way." These exotic galaxies might be a byproduct of environmental processes within galaxy clusters, but UDGs have also now been found in the field. It is crucial for understanding their origins to test if UDGs have the same properties in cluster and field environments. Here we propose studying the stellar populations (ages and metallicities) of seven UDGs using Spitzer/IRAC 3.6- and 4.5-micron imaging combined with optical photometry, along with mass estimation of three of the UDGs using HST/ACS imaging to provide globular cluster number counts and colors (proxies for halo mass). This ultra low surface brightness photometry in the near infrared, on an important new class of galaxies, could become a legacy result from the Spitzer mission.

OBSERVING DESCRIPTION

The technical goal of the observations is to detect globular cluster candidates around ultra-diffuse galaxies (UDGs), with 5-sigma point-source detection limits of F606W = 27.7, F814W = 27.2.

We will observe each of 3 UDGs in 2 filters, with 1 orbit per filter. The same orientation is used for both filters.
We will use a large+small 4-point dither pattern to remove chip gap, hot pixels, and cosmic rays.

Visit

Proposal 14846, DGSAT I (01), completed Fri Jun 23 01:05:21 GMT 2017

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Diagnostics

(DGSAT I (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(DGSAT I (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.23 Angle Between Sides= Center Pattern=false	(1), (2)

Fixed Targets

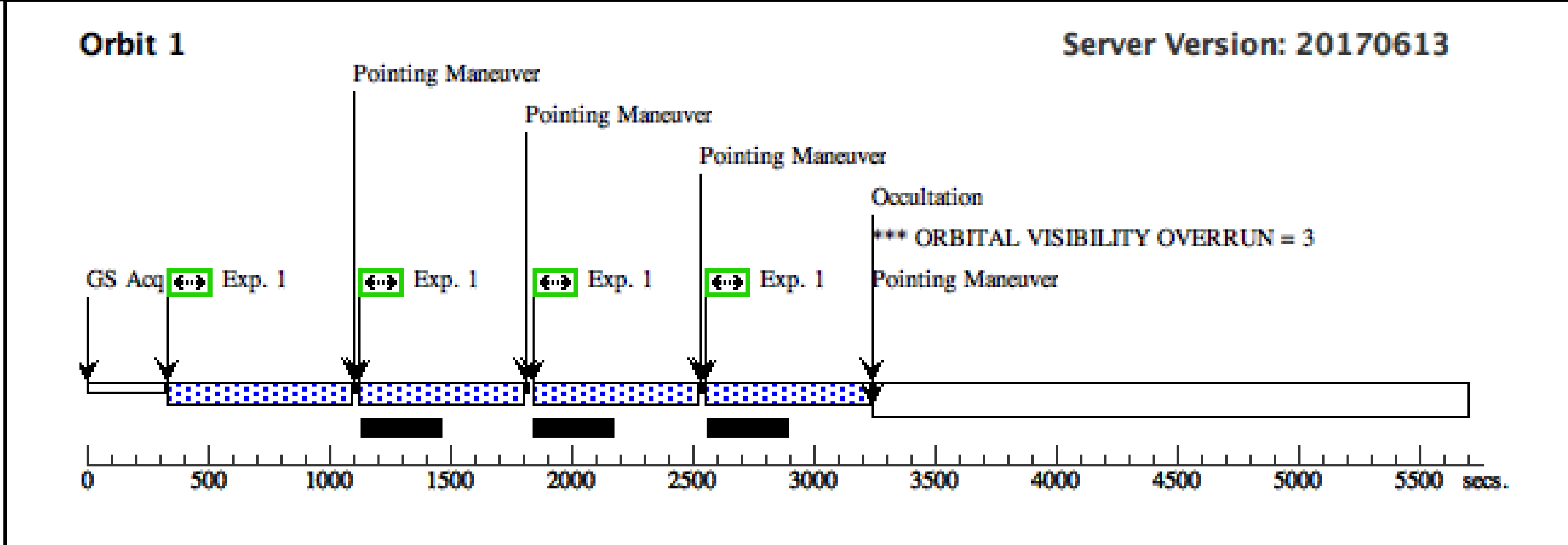
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	DGSAT-I	RA: 01 17 35.5900 (19.3982917d) Dec: +33 31 42.37 (33.52844d) Equinox: J2000	Radial Velocity: 5450 km/sec	V=18.18+/-0.04	Reference Frame: ICRS

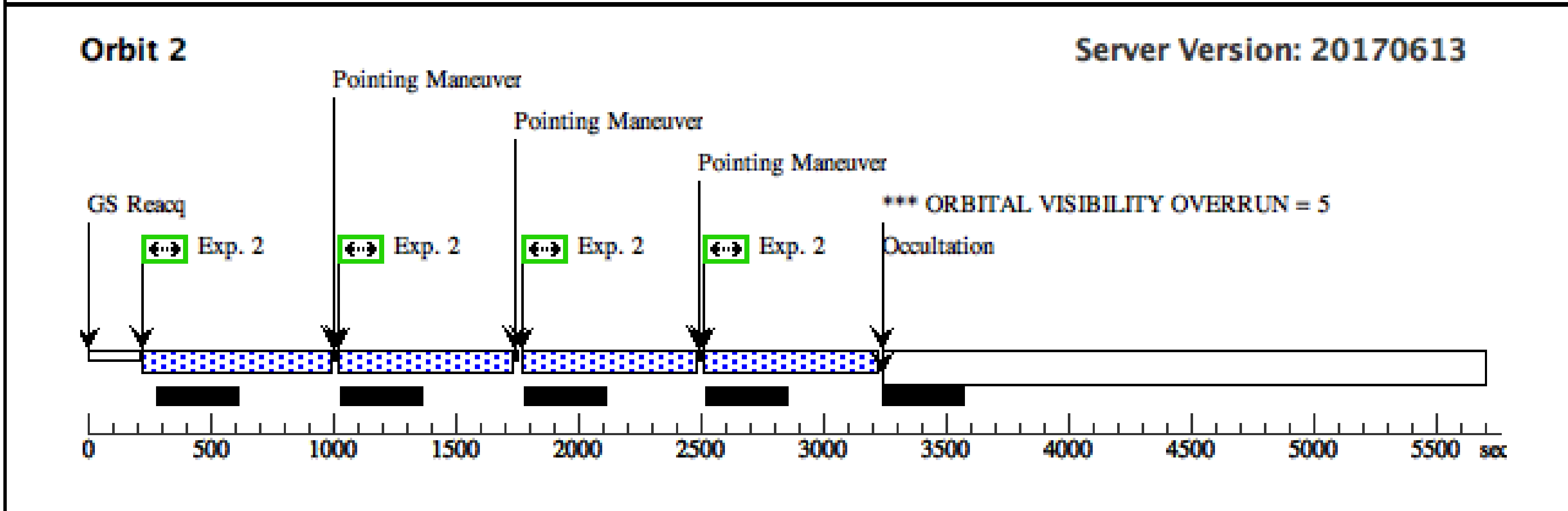
Comments: Low surface brightness galaxy, diameter ~ 20 arcsec.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DGSAT I, F 814W	(1) DGSAT-I	ACS/WFC, ACCUM, WFC1	F814W			Pattern 2, Exps 1-1 in DGSAT I (01) (2)	553 Secs (2212 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]*	***[1]***
2	DGSAT I, F 606W	(1) DGSAT-I	ACS/WFC, ACCUM, WFC1	F606W			Pattern 2, Exps 2-2 in DGSAT I (01) (2)	588 Secs (2352 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]*	***[2]***

Orbit Structure





Visit

Proposal 14846, R-127-1 (02), failed

Fri Jun 23 01:05:21 GMT 2017

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Diagnostics

(R-127-1 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(R-127-1 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.23 Angle Between Sides= Center Pattern=false	(1), (2)

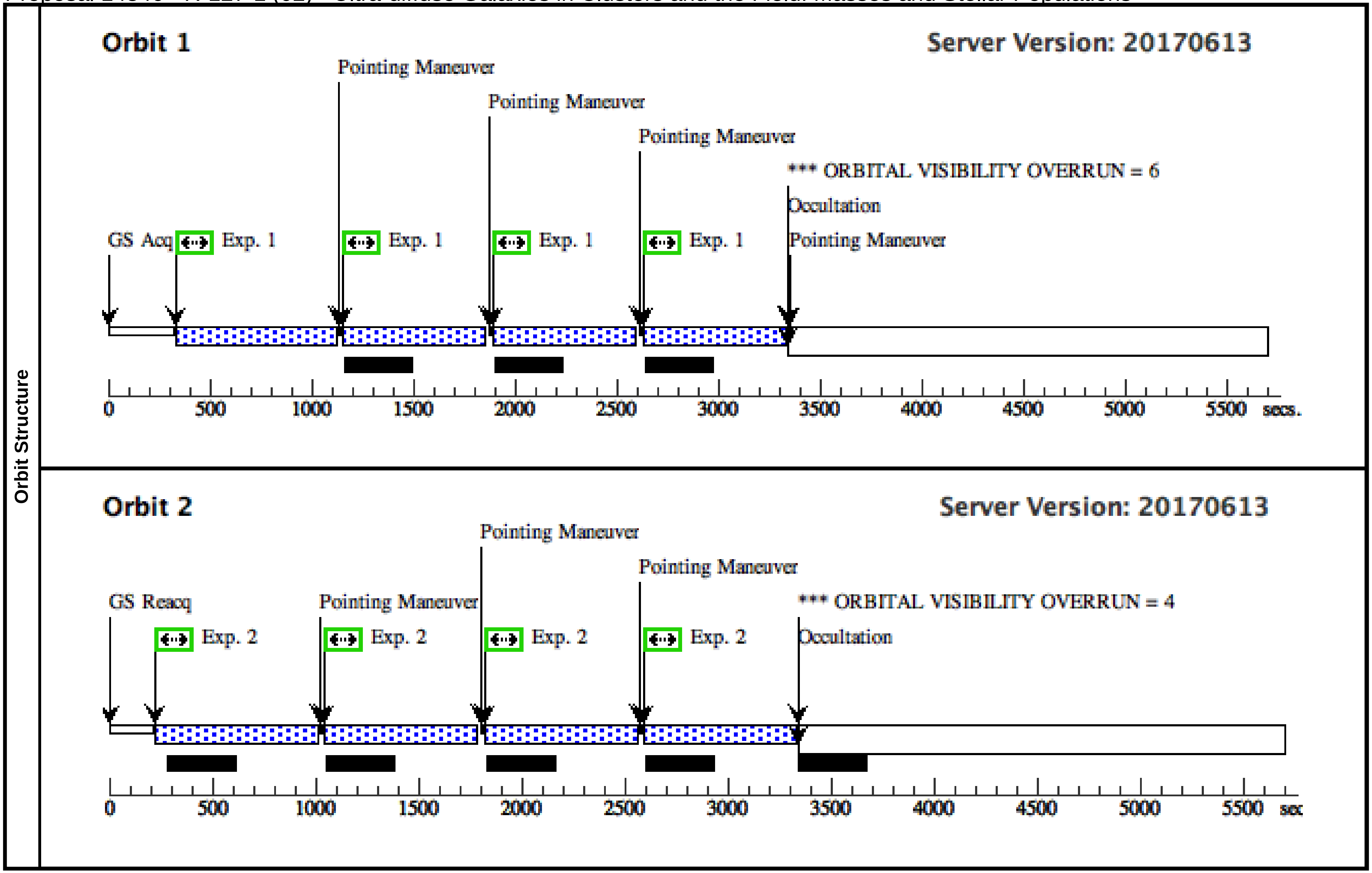
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	R-127-1 Alt Name1: PG1133+4755	RA: 11 36 17.5847 (174.0732696d) Dec: +47 38 48.71 (47.64686d) Equinox: J2000	Radial Velocity: 5250 km/sec	V=18.4	Reference Frame: ICRS

Comments: Low surface brightness galaxy, diameter ~ 40 arcsec.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	R-127-1, F814W	(2) R-127-1	ACS/WFC, ACCUM, WFC1	F814W			Pattern 2, Exps 1-1 in R-127-1 (02) (2)	580 Secs (2320 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]*	***[1]***
2	R-127-1, F606W	(2) R-127-1	ACS/WFC, ACCUM, WFC1	F606W			Pattern 2, Exps 2-2 in R-127-1 (02) (2)	614 Secs (2456 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]*	***[2]***


Orbit Structure
Orbit 1
Server Version: 20170613
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
*** ORBITAL VISIBILITY OVERRUN = 6
Occultation
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Pointing Maneuver
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 secs.
Orbit 2
Server Version: 20170613
Pointing Maneuver
Pointing Maneuver
GS Reacq
Pointing Maneuver
*** ORBITAL VISIBILITY OVERRUN = 4
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 sec

Visit

Proposal 14846, M-161-1 (03), scheduling — Fri Jun 23 01:05:21 GMT 2017

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Diagnostics

(M-161-1 (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(M-161-1 (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.23 Angle Between Sides= Center Pattern=false	(1), (2)

Fixed Targets

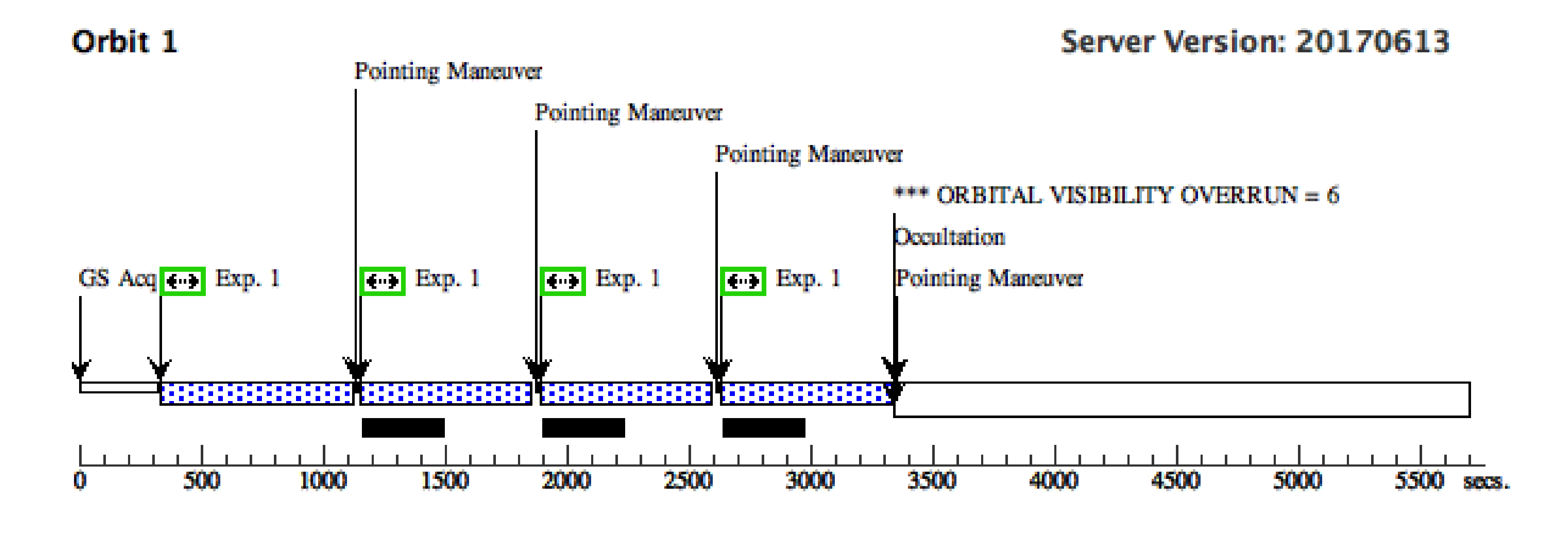
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	M-161-1 Alt Name1: PG1327+4637	RA: 13 29 53.6198 (202.4734158d) Dec: +46 22 19.95 (46.37221d) Equinox: J2000	Radial Velocity: 5600 km/sec	V=18.7	Reference Frame: ICRS

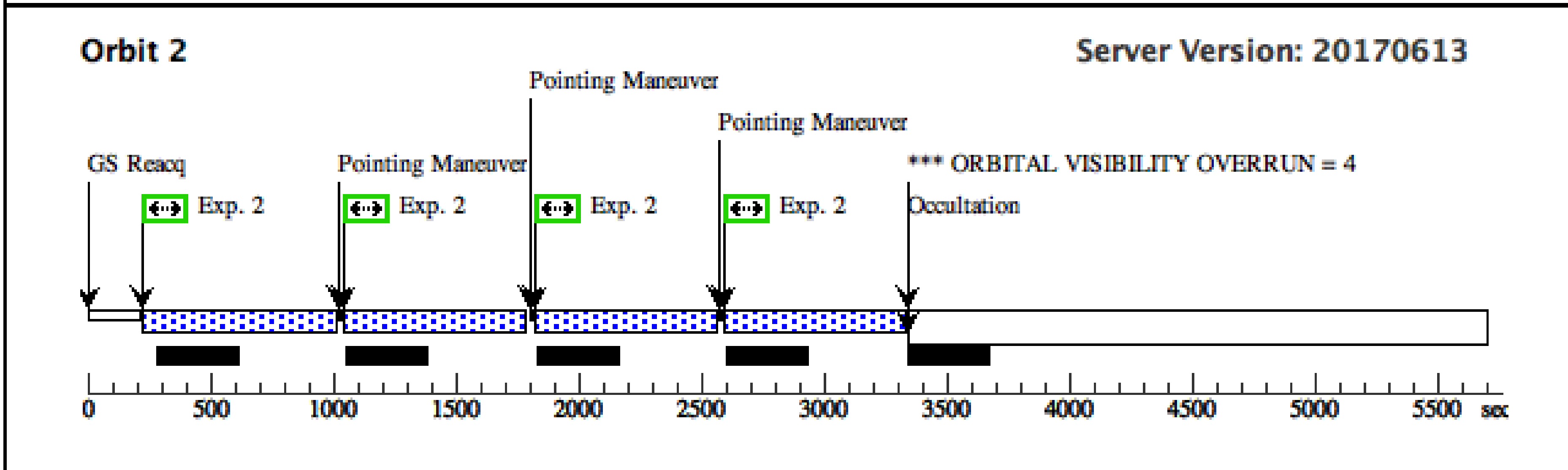
Comments: Low surface brightness galaxy, diameter ~ 40 arcsec.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	M-161-1, F814W	(3) M-161-1	ACS/WFC, ACCUM, WFC1	F814W			Pattern 2, Exps 1-1 in M-161-1 (03) (2)	580 Secs (2320 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]*	***[1]***
2	M-161-1, F606W	(3) M-161-1	ACS/WFC, ACCUM, WFC1	F606W			Pattern 2, Exps 2-2 in M-161-1 (03) (2)	614 Secs (2456 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]*	***[2]***

Orbit Structure





Visit

Proposal 14846, R-127-1 (52) Fri Jun 23 01:05:21 GMT 2017
Diagnostic Status: Warning
Scientific Instruments: ACS/WFC
Special Requirements: (none)

Diagnostics

(R-127-1 (52)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN
(R-127-1 (52)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.23 Angle Between Sides= Center Pattern=false	(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	R-127-1 Alt Name1: PG1133+4755	RA: 11 36 17.5847 (174.0732696d) Dec: +47 38 48.71 (47.64686d) Equinox: J2000	Radial Velocity: 5250 km/sec	V=18.4	Reference Frame: ICRS

Comments: Low surface brightness galaxy, diameter ~ 40 arcsec.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	R-127-1, F814W	(2) R-127-1	ACS/WFC, ACCUM, WFC1	F814W			Pattern 2, Exps 1-1 in R-127-1 (52) (2)	580 Secs (2320 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]*	***[1]***
2	R-127-1, F606W	(2) R-127-1	ACS/WFC, ACCUM, WFC1	F606W			Pattern 2, Exps 2-2 in R-127-1 (52) (2)	614 Secs (2456 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]*	***[2]***

Orbit Structure