13746 - Is the Crater satellite the Milky Way's Smallest Dwarf Galaxy or its Largest Globular Cluster?

Cycle: 22, 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) CRATER	WFC3/UVIS	1	26-Aug-2014 21:04:50.0	yes
02	(2) CRATER-POS2	ACS/WFC	4	26-Aug-2014 21:04:53.0	yes

5 Total Orbits Used

ABSTRACT

We propose deep ACS/WFC3 photometry that will reveal the nature and origin of the Galactic satellite known as 'Crater'. Crater exhibits properties intermediate between dwarf galaxies and globular clusters. As a dwarf galaxy, Crater would be the smallest and least massive known in the Galactic

halo. As a globular cluster, Crater would be the largest and most distant. Our photometric observations will tell the age, metallicity, limits on metallicity spread, mass function and dynamical state of Crater's stellar population(s). We will use this information to distinguish whether Crater is 1) a dwarf galaxy that formed in a dark matter potential, or 2) a globular cluster that has grown to its current size via internal dynamical evolution. In either case, we will learn what mechanisms are responsible for Crater's extreme properties.

OBSERVING DESCRIPTION

This proposal is to obtain deep imaging in two filters, and imaging to ~V=24.5 in two filters for the newly discovered Crater globular cluster.

A minor modification was made to the published central coordinates to help to avoid the two very bright field stars. In addition, small pos-targs refined the position, a different POS-TARG for the WFC3 field snd for the ACS field.

The primary goal of visit 1, one orbit, is to get deep imaging with WFC3 in F390M.
There are ORIENT constraints to avoid the two bright stars(the WFC3 FOV is smaller than the ACS below).

The primary goal of visit 2, 4 orbits, is to get deep imaging with ACS in F606 and F814.
We also obtain short exposures in F555 and F814 and F606. There is a small pos-targ difference in
exposure 3 of visit 2 so that the two short F555W exposures have dithers between them.
The F555 data is to match the F390 WFC3 data, and allows us to use a previous calibration to obtain metallicities of stars in this object.
We apply some ORIENTS to avoid the two bright stars. the ORIENTS are a bit stringent in order to ensure that we avoid bright stars AND get all of Crater at all orients.

Visit

Proposal 13746, Visit 01, implementation Wed Aug 27 01:04:55 GMT 2014

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; ORIENT 0D TO 4 D; ORIENT 47D TO 96 D; ORIENT 129D TO 184 D; ORIENT 225D TO 279 D; ORIENT 317D TO 359.9 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(2)

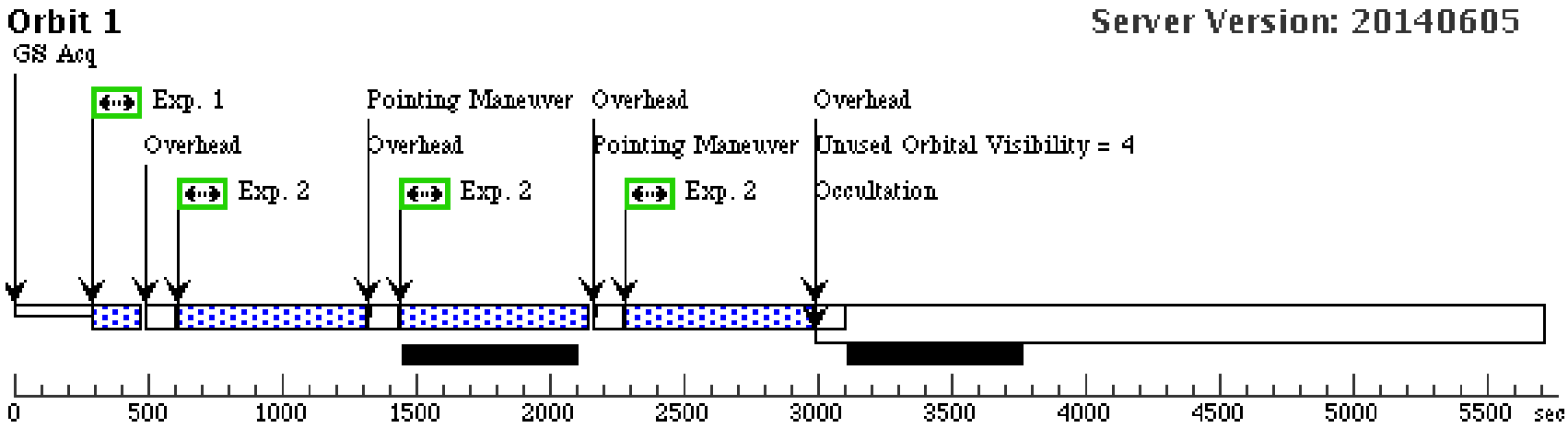
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	CRATER	RA: 11 36 16.5150 (174.0688125d) Dec: -10 52 0.87 (-10.86691d) Equinox: J2000		V=20	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) CRATER	WFC3/UVIS, ACCUM, UVIS-CENTER	F390M	FLASH=8	POS TARG -1.16,-1.63		150 Secs (150 Secs) *[==>]*	 ***[1]***
2		(1) CRATER	WFC3/UVIS, ACCUM, UVIS-CENTER	F390M	FLASH=7	POS TARG -1.16,-1.63	Pattern 1, Exps 2-2 in Visit 01 (1)	700 Secs (2100 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***

Orbit Structure



Visit

Proposal 13746, Visit 02, implementation Wed Aug 27 01:04:55 GMT 2014

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: SCHED 100%; ORIENT 0D TO 37 D; ORIENT 86D TO 123 D; ORIENT 172D TO 217 D; ORIENT 265D TO 303 D; ORIENT 351D TO 359.9 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.28 Angle Between Sides= Center Pattern=false		(2), (4), (6), (8)

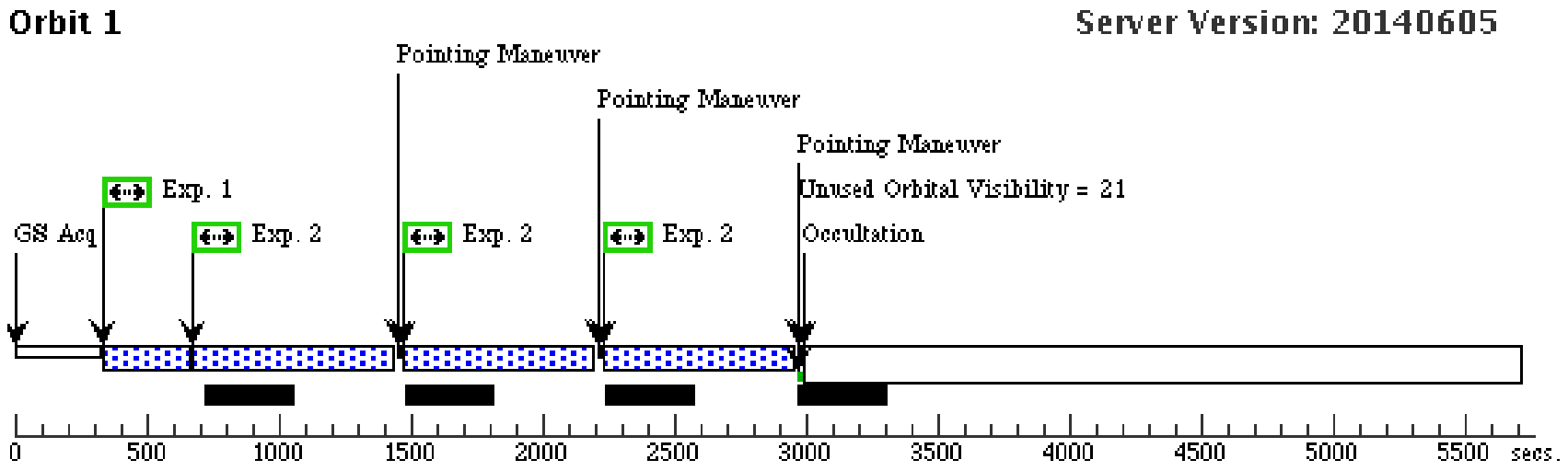
Fixed Targets

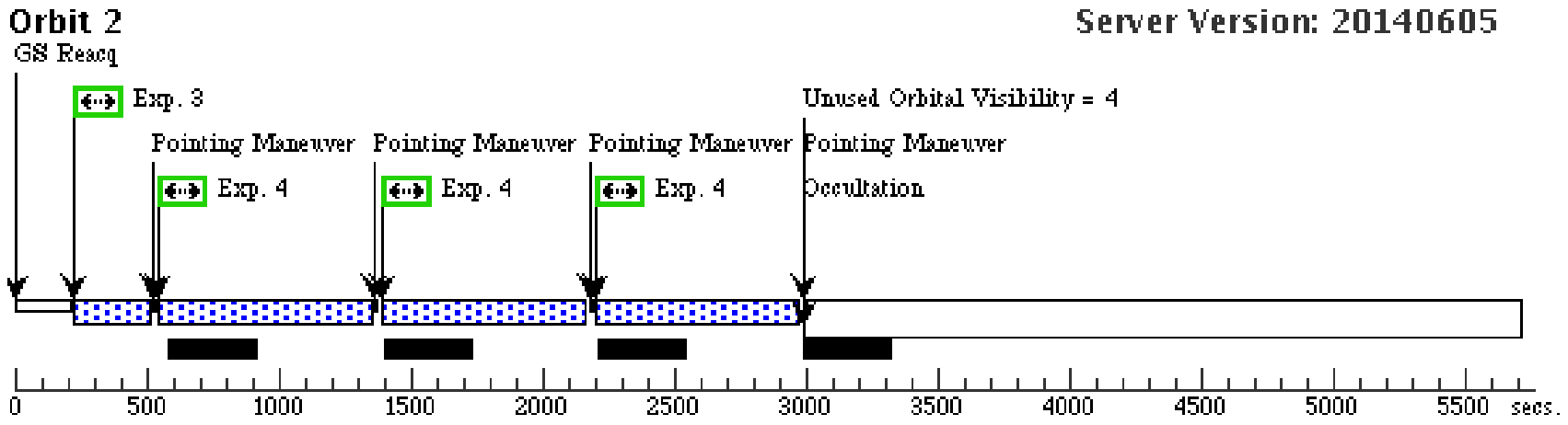
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	CRATER-POS2	RA: 11 36 16.4549 (174.0685621d) Dec: -10 51 37.09 (-10.86030d) Equinox: J2000		V=20	Reference Frame: ICRS

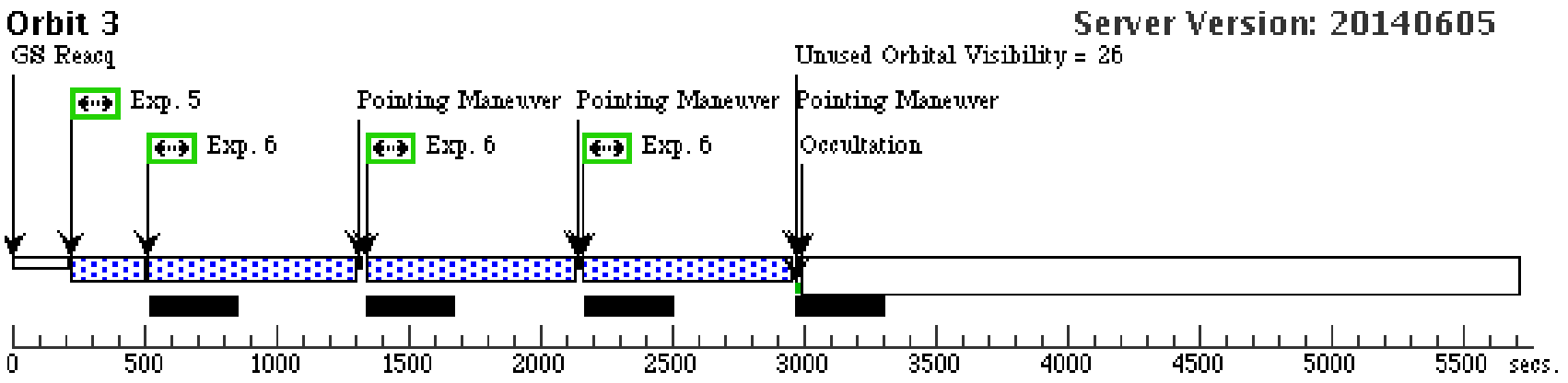
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) CRATER-POS2	ACS/WFC, ACCUM, WFCENTER	F555W				120 Secs (120 Secs)	
								[==>]	***[1]***
2		(2) CRATER-POS2	ACS/WFC, ACCUM, WFCENTER	F606W			Pattern 2, Exps 2-2 in Visit 02 (2)	600 Secs (1800 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3		(2) CRATER-POS2	ACS/WFC, ACCUM, WFCENTER	F555W		POS TARG 0.25,0.35		120 Secs (120 Secs)	
								[==>]	***[2]***
4		(2) CRATER-POS2	ACS/WFC, ACCUM, WFCENTER	F814W			Pattern 2, Exps 4-4 in Visit 02 (2)	650 Secs (1950 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
5		(2) CRATER-POS2	ACS/WFC, ACCUM, WFCENTER	F814W				150 Secs (150 Secs)	
								[==>]	***[3]***
6		(2) CRATER-POS2	ACS/WFC, ACCUM, WFCENTER	F814W			Pattern 2, Exps 6-6 in Visit 02 (2)	665 Secs (1995 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[3]***
7		(2) CRATER-POS2	ACS/WFC, ACCUM, WFCENTER	F606W				150 Secs (150 Secs)	
								[==>]	***[4]***
8		(2) CRATER-POS2	ACS/WFC, ACCUM, WFCENTER	F606W			Pattern 2, Exps 8-8 in Visit 02 (2)	655 Secs (1965 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[4]***

Orbit Structure



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Exp. 6
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
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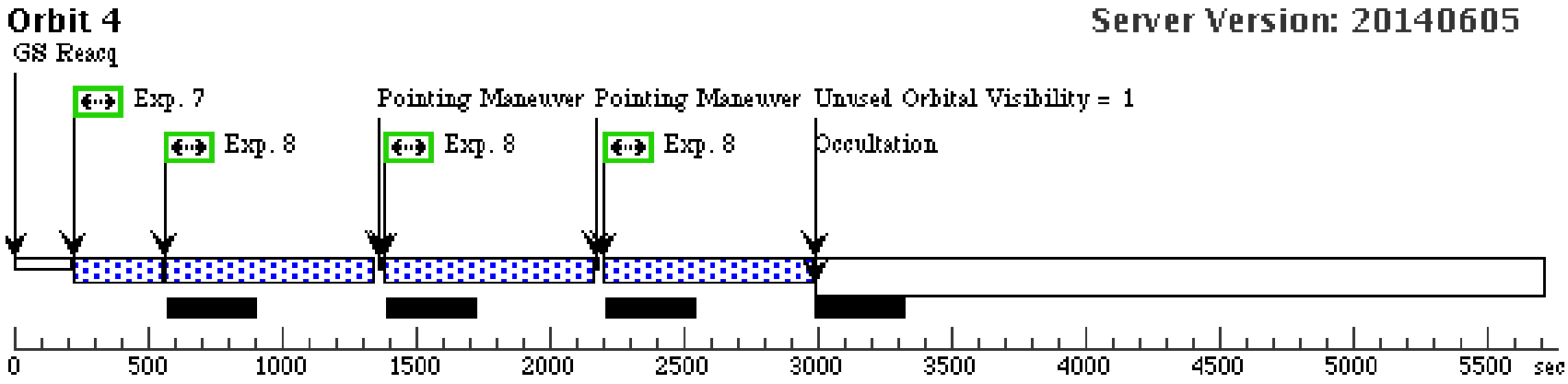
3000
3500
4000
4500
5000
5500
secs.


Orbit 4
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GS Reacq
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Exp. 8
Exp. 8
Exp. 8
Pointing Maneuver
Pointing Maneuver
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Occultation
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2000
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