17891 - Low-mass Dwarf Galaxies: Dark Matter & Reionization at the Edge

Cycle: 32, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
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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) SMDG1309	WFC3/UVIS	1	30-Dec-2024 14:00:11.0	yes
02	(2) SMDG1333	WFC3/UVIS	1	30-Dec-2024 14:00:12.0	yes

2 Total Orbits Used

ABSTRACT

We request 2x3.25=6.5h of VLA D-configuration time in order to detect and map HI emission in the direction of two newly discovered Local Volume dwarf galaxies which display prominent UV and/or blue stellar emission. These dwarf galaxies were identified with a convolutional neural

network approach which has already yielded two of the lowest mass, isolated dwarf galaxies known to date and we will double the sample with this proposal. The VLA data will be used to measure the HI content and velocity gradients for initial kinematic modeling. We will also identify HI-optical offsets or signs of gas accretion, both of which are expected for low-mass systems which have been strongly effected by reionization or internal feedback. In addition, we request 1+1=2 orbits of HST/WFC3 (F606W+F814W) in order to measure a tip of the red giant branch distance (essential for deriving physical quantities) and star formation history of each system. Combined HI+optical data are required to understand the nearly unexplored effects of reionization and supernova/star formation feedback in the smallest dark matter halos.

OBSERVING DESCRIPTION

We will use WFC3/UVIS observations in the F606W and F814W bands to observe two nearby dwarf galaxies (one orbit per dwarf). The science goals are to measure a TRGB distance, luminosity, structural properties and potentially a star formation history for each system.

Each target will be observed for one orbit. We have employed a two-point dither pattern for each filter to remove cosmic rays and hot pixels. We chose the UVIS1 aperture to center each dwarf on one of the chips. Each target is small enough that this will give full spatial coverage of each dwarf no matter what the orient is. We do not place any orient constraints on the observations.

Visit

Proposal 17891, SMDG1309 (01), implementation Mon Dec 30 19:00:12 GMT 2024

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

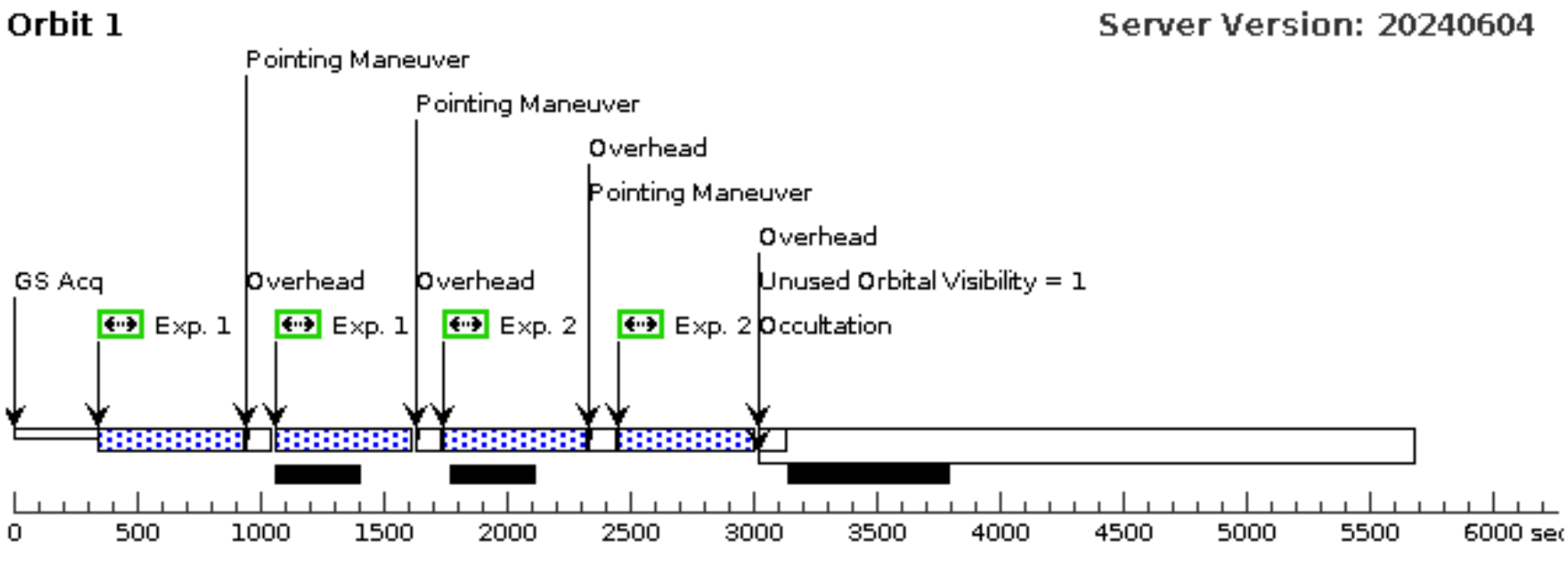
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SMDG1309	RA: 13 09 45.9100 (197.4412917d) Dec: -23 32 32.64 (-23.54240d) Equinox: J2000		V=17	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[DWARF ELLIPTICAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	SMDG1309 F606W	(1) SMDG1309	WFC3/UVIS, ACCUM, UVIS2	F606W			Pattern 1, Exps 1-1 in SMDG1309 (01) (1)	557 Secs (1114 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	 ***[1]***
2	SMDG1309 F814W	(1) SMDG1309	WFC3/UVIS, ACCUM, UVIS2	F814W	FLASH=4		Pattern 1, Exps 2-2 in SMDG1309 (01) (1)	557 Secs (1114 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17891, SMDG1333 (02), implementation Mon Dec 30 19:00:12 GMT 2024

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SMDG1333	RA: 13 33 25.8720 (203.3578000d) Dec: +56 29 59.64 (56.49990d) Equinox: J2000		V=17	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[DWARF ELLIPTICAL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	SMDG1333 F606W	(2) SMDG1333	WFC3/UVIS, ACCUM, UVIS2	F606W			Pattern 1, Exps 1-1 in SMDG1333 (02) (1)	557 Secs (1150 Secs) *[==>575.0 Secs (Pattern 1)]* *[==>575.0 Secs (Pattern 2)]*	 ***[1]***
2	SMDG1333 F814W	(2) SMDG1333	WFC3/UVIS, ACCUM, UVIS2	F814W	FLASH=4		Pattern 1, Exps 2-2 in SMDG1333 (02) (1)	557 Secs (1150 Secs) *[==>575.0 Secs (Pattern 1)]* *[==>575.0 Secs (Pattern 2)]*	 ***[1]***

Orbit Structure