



13745 - Resolving the Tip of the Red Giant Branch of Two New Candidate Local Group Dwarf Galaxies

Cycle: 22, Proposal Category: GO
(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. Erik Tollerud (PI) (Contact)	Yale University	erik.tollerud@yale.edu
Prof. Marla C. Geha (CoI)	Yale University	marla.geha@yale.edu
Prof. Mary E. Putman (CoI)	Columbia University in the City of New York	mputman@astro.columbia.edu
Jana Grcevich (CoI)	American Museum of Natural History	jgrcevich@amnh.org
Dr. Daniel Stern (CoI)	Jet Propulsion Laboratory	daniel.k.stern@jpl.nasa.gov

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) HI22	ACS/WFC	1	18-Sep-2014 21:01:27.0	yes
02	(2) HI23	ACS/WFC	1	18-Sep-2014 21:01:28.0	yes

2 Total Orbits Used

ABSTRACT

We propose to use ACS/WFC to observe two faint dwarf galaxies recently discovered via their HI emission. Based on a blind HI search of 40 HI clumps from 7500 square degrees of the GALFA-HI survey, these two candidates are the only objects with optical counterparts. They show HI and H α emission consistent with nearby galaxies, and have blue stars that are barely resolved in ground-based optical imaging with good seeing. These resolved stars are consistent with the galaxies being at Local Group distances. If they are in the Local Group, these galaxies are both less luminous and more compact than the recently-discovered Leo P, also found first with HI observations. They may then also be the faintest known

star-forming galaxies. The ground-based imaging leaves large distance uncertainty, however, because the tip of the red giant branch cannot be resolved. We propose one orbit per galaxy of ACS/WFC imaging in F606W and F814W to measure accurate TRGB distances and determine if they truly are Local Group galaxies. If so, these galaxies provide tests on both the efficacy of Lambda CDM in predicting the properties of dwarf galaxies in low density environments, and the lowest-luminosity data points on models of galaxy star formation.

OBSERVING DESCRIPTION

The observations for this program are aimed at detecting RGB stars in the two target galaxies, to apply the Tip of the Red Giant Branch method to determine their distance. There are two targets, HI22 and HI23, which are to be observed for one orbit each with ACS/WFC. Each orbit is to be split roughly evenly between F606W and F814W (slightly favoring more exposure time for F606W).

Each target should be centered on the WHC1 chip because they both fit on a single chip (and this avoids some part of the galaxies being on the chip gap). They are also small enough that their long axes fit on the chip, so there is no need for a special orientation. Two exposures are to be done for each filter per target, with a dither between them. This serves to fill the chip gap, avoid hot pixels/CCD defects, and reject cosmic rays. This ends up providing about 1100 s per filter per exposure, which the ETC indicates should get down to around 27 mags at S/N~10.

Proposal 13745 - HI22 visit (01) - Resolving the Tip of the Red Giant Branch of Two New Candidate Local Group Dwarf Galaxies

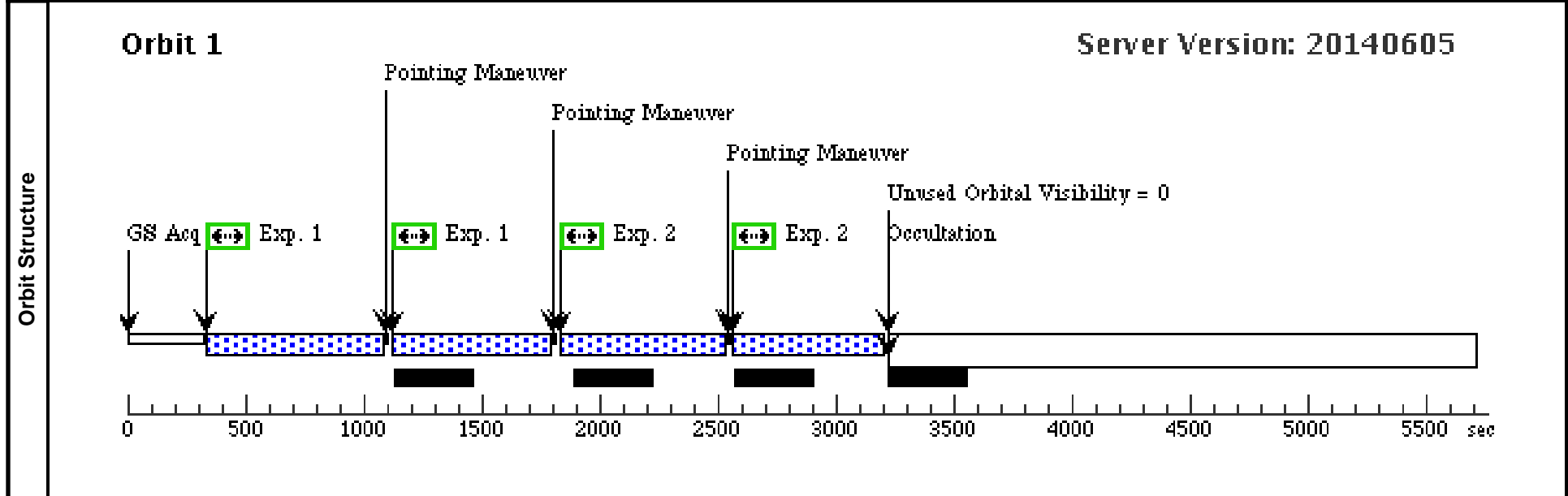
Fri Sep 19 01:01:29 GMT 2014

Visit	Proposal 13745, HI22 visit (01), scheduling		
	Diagnostic Status: No Diagnostics		
	Scientific Instruments: ACS/WFC		
	Special Requirements: ORIENT 325D TO 120 D; ORIENT 185D TO 202 D		

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

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	HI22	RA: 00 14 46.0300 (3.6917917d) Dec: +10 48 47.01 (10.81306d) Equinox: J2000		V=(?) r~17.5	Reference Frame: ICRS

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1		(1) HI22	ACS/WFC, ACCUM, WFC1	F606W				Pattern 1, Exps 1-1 in HI22 visit (01) (1)	546 Secs (1092 Secs)	
										[=>(Pattern 1)] [=>(Pattern 2)]	[1]
2		(1) HI22	ACS/WFC, ACCUM, WFC1	F814W				Pattern 1, Exps 2-2 in HI22 visit (01) (1)	520 Secs (1040 Secs)		
									[=>(Pattern 1)] [=>(Pattern 2)]	[1]	



Proposal 13745 - HI23 visit (02) - Resolving the Tip of the Red Giant Branch of Two New Candidate Local Group Dwarf Galaxies

Fri Sep 19 01:01:30 GMT 2014

Visit	Proposal 13745, HI23 visit (02), scheduling Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: ORIENT 103D TO 106 D		
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Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=85.28 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	HI23	RA: 01 19 11.7110 (19.7987958d) Dec: +11 07 18.22 (11.12173d) Equinox: J2000		V=(?) r~17.3	Reference Frame: ICRS

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(2) HI23	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 20,15	Pattern 1, Exps 1-1 in HI23 visit (02) (1)	536 Secs (1072 Secs)	
									[=>(Pattern 1)] [=>(Pattern 2)]	[1]
	2		(2) HI23	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 20,15	Pattern 1, Exps 2-2 in HI23 visit (02) (1)	510 Secs (1020 Secs)	
								[=>(Pattern 1)] [=>(Pattern 2)]	[1]	

