15917 - Calibrating the Tip of the Red Giant Branch Distance Indicator in the Near-Infrared

Cycle: 27, Proposal Category: GO

(JWST Initative)

(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) NGC2403-1 ANY	ACS/WFC WFC3/IR	1	09-Oct-2019 15:00:14.0	yes
02	(2) NGC2403-2 ANY	ACS/WFC WFC3/IR	1	09-Oct-2019 15:00:16.0	yes
03	(3) NGC300-1 ANY	ACS/WFC WFC3/IR	1	09-Oct-2019 15:00:17.0	yes
04	(4) NGC300-2 ANY	ACS/WFC WFC3/IR	1	09-Oct-2019 15:00:19.0	yes
05	(5) M81-1 ANY	ACS/WFC WFC3/IR	1	09-Oct-2019 15:00:20.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
06	(6) M81-2 ANY	ACS/WFC WFC3/IR	1	09-Oct-2019 15:00:21.0	yes
07	(7) NGC253-1 ANY	ACS/WFC WFC3/IR	1	09-Oct-2019 15:00:22.0	yes
08	(8) NGC253-2 ANY	ACS/WFC WFC3/IR	1	09-Oct-2019 15:00:24.0	yes

8 Total Orbits Used

ABSTRACT

The tip of the red giant branch (TRGB) method is the most accurate and least expensive distance indicator for nearby galaxies. HST has delivered TRGB distances to 100's of nearby galaxies, supporting innumerable astrophysical measurements and providing a new, independent route to a precision measurement of the Hubble constant, H_0.

TRGB distances are primarily measured from I-band (F814W) observations as the I-band luminosities of the stars at the tip of the red giant branch have little dependency on stellar age and only a modest dependency on metallicity; this metallicity dependency is well-understood and corrected for in the I-band TRGB calibration. In the near-infrared (NIR), the TRGB is ~2 mag brighter. With the NIR capabilities of HST and JWST, accurate distances to nearby galaxies are possible with greater efficiency and to larger distances. There is already momentum in the H_0 community to pursue NIR TRGB distances using HST as a stepping stone to JWST. However, models show that the TRGB has a greater dependency on both stellar age and metallicity in the NIR. Thus, without a foundational investment in empirically calibrating the NIR TRGB and robustly testing the calibration, existing and planned NIR TRGB programs are vulnerable to systematic biases. We propose observations of 8 fields in 4 nearby galaxy halos with the ACS F814W and the WFC3 F110W and F160W filters to calibrate the NIR TRGB. We will quantify the sensitivity of the NIR TRGB to age and metallicity variations, while simultaneously characterizing the stellar content of galaxy halos. Such a calibration is urgently needed before undertaking NIR TRGB distance work with JWST.

OBSERVING DESCRIPTION

The primary goals of this proposal are to measure the tip of the red giant branch (TRGB) distances to 4 spiral galaxies using optical imaging from the ACS camera of the halo stars, use those distances to calibrate the TRGB in the infrared imaging from the WFC3 camera, and characterize the stellar

content of the halos. Orbit allocation = 8 orbits (1 orbit for 2 fields per galaxy) which include 8 primary ACS orbits and 8 coordinated parallel WFC3 orbits.

All primary visits include 1-orbit with the ACS/WFC. The orbit is split between the F606W filter and the F814W filter with a small 2 pixel offset in pointing. The small pointing offset is implemented using the POS-TARG of X=0.474 and Y=0.424 specificed in the WFC3 manual as the 2-point line dither offset equivalent of a 3.5 pixel shift in the WFC3 IR detector. We use the larger WFC3 IR shift (rather than the ACS dither) to ensure we are moving off hot pixels in both cameras. We do not intend to cover the chip gap with our dither pattern. The coordinated parallel observations are to be obtained with the WFC3 IR camera split between the F110W and F160W filters.

The visits are requested within specific orientation ranges. The primary observations are of a field in the halo of each target galaxy. The orientation ranges have been chosen such that the coordinated parallels image a second field in halo of the target galaxy. For the second visit for the target galaxy, the cameras are placed on the opposite fields, ensuring that both halo fields on each galaxy are observed with each camera.

Visit

Proposal 15917, NGC2403-1 (01), implementation Wed Oct 09 19:00:24 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 288D TO 292 D

Fixed Targets

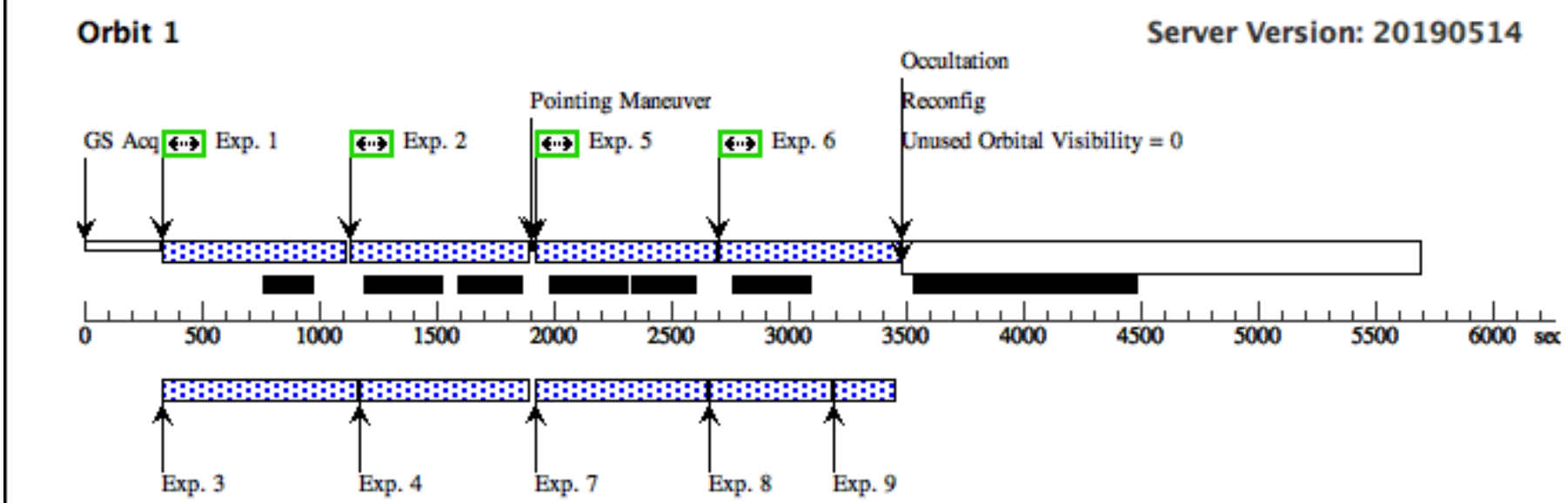
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC2403-1	RA: 07 38 45.3272 (114.6888633d) Dec: +65 29 38.00 (65.49389d) Equinox: J2000	Epoch of Position: 2015.5	V=8.38	Reference Frame: SIMBAD

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[HALO]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F606W Dither 0	(1) NGC2403-1	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0,0	Sequence 1-9 Non-Int in NGC2403-1 (01) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in NGC2403-1 (01)	579 Secs (579 Secs) *[==>]*	***[1]***
2	F814W Dither 0	(1) NGC2403-1	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0,0	Sequence 1-9 Non-Int in NGC2403-1 (01) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in NGC2403-1 (01)	579 Secs (579 Secs) *[==>]*	***[1]***
3	F110W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=11; SAMP-SEQ=STEP200		Sequence 1-9 Non-Int in NGC2403-1 (01) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in NGC2403-1 (01)	799.231201 Secs (799.231 Secs) *[==>]*	***[1]***
4	F160W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in NGC2403-1 (01) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in NGC2403-1 (01)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
5	F606W Dither 1	(1) NGC2403-1	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.474,0.424	Sequence 1-9 Non-Int in NGC2403-1 (01) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in NGC2403-1 (01)	588 Secs (588 Secs) *[==>]*	***[1]***
6	F814W Dither 1	(1) NGC2403-1	ACS/WFC, ACCUM, WFCENTER	F814W		SAME POS AS 5	Sequence 1-9 Non-Int in NGC2403-1 (01) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in NGC2403-1 (01)	588 Secs (588 Secs) *[==>]*	***[1]***
7	F110W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in NGC2403-1 (01) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in NGC2403-1 (01)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
8	F160W Dither 1.1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in NGC2403-1 (01) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in NGC2403-1 (01)	499.231969 Secs (499.232 Secs) *[==>]*	***[1]***
9	F160W Dither 1.2	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	SAMP-SEQ=STEP25; NSAMP=14		Sequence 1-9 Non-Int in NGC2403-1 (01) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in NGC2403-1 (01)	249.234346 Secs (249.234 Secs) *[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15917, NGC2403-2 (02), implementation Wed Oct 09 19:00:24 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 108D TO 112 D

Fixed Targets

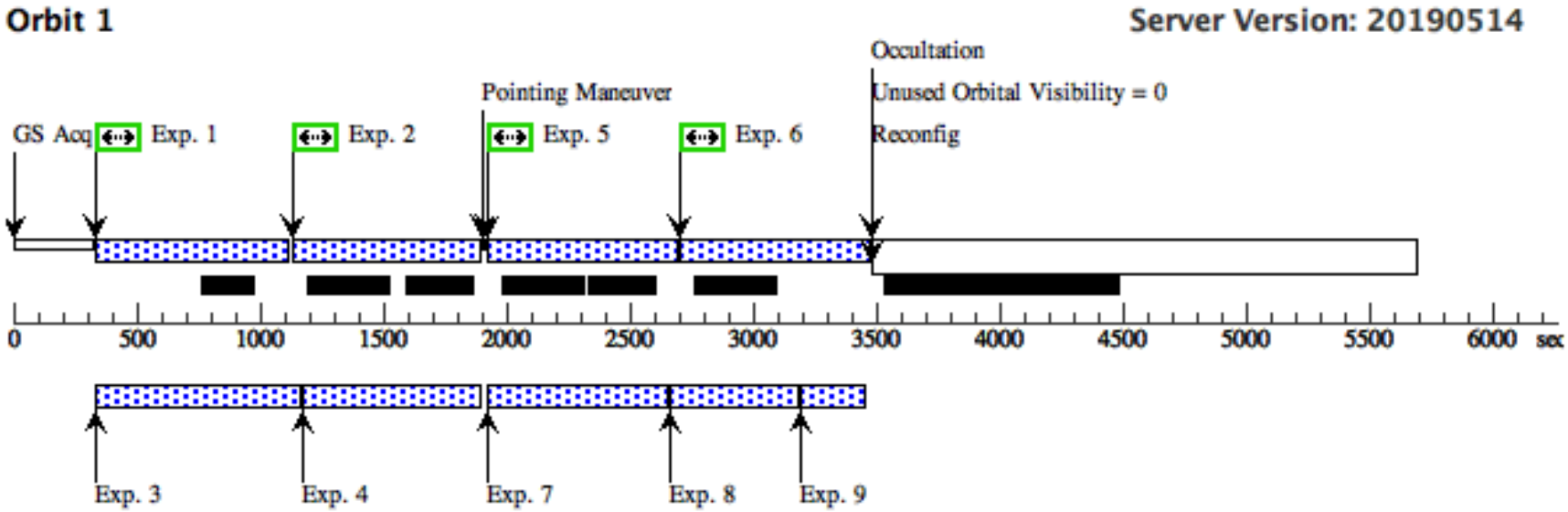
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	NGC2403-2	RA: 07 38 21.4502 (114.5893758d) Dec: +65 35 12.32 (65.58676d) Equinox: J2000	Epoch of Position: 2015.5	V=8.38	Reference Frame: SIMBAD

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[HALO]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F606W Dither 0	(2) NGC2403-2	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0,0	Sequence 1-9 Non-Int in NGC2403-2 (02) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in NGC2403-2 (02)	579 Secs (579 Secs) *[==>]*	***[1]***
2	F814W Dither 0	(2) NGC2403-2	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0,0	Sequence 1-9 Non-Int in NGC2403-2 (02) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in NGC2403-2 (02)	579 Secs (579 Secs) *[==>]*	***[1]***
3	F110W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=11; SAMP-SEQ=STEP200		Sequence 1-9 Non-Int in NGC2403-2 (02) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in NGC2403-2 (02)	799.231201 Secs (799.231 Secs) *[==>]*	***[1]***
4	F160W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in NGC2403-2 (02) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in NGC2403-2 (02)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
5	F606W Dither 1	(2) NGC2403-2	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.474,0.424	Sequence 1-9 Non-Int in NGC2403-2 (02) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in NGC2403-2 (02)	588 Secs (588 Secs) *[==>]*	***[1]***
6	F814W Dither 1	(2) NGC2403-2	ACS/WFC, ACCUM, WFCENTER	F814W		SAME POS AS 5	Sequence 1-9 Non-Int in NGC2403-2 (02) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in NGC2403-2 (02)	588 Secs (588 Secs) *[==>]*	***[1]***
7	F110W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in NGC2403-2 (02) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in NGC2403-2 (02)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
8	F160W Dither 1.1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in NGC2403-2 (02) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in NGC2403-2 (02)	499.231969 Secs (499.232 Secs) *[==>]*	***[1]***
9	F160W Dither 1.2	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	SAMP-SEQ=STEP25; NSAMP=14		Sequence 1-9 Non-Int in NGC2403-2 (02) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in NGC2403-2 (02)	249.234346 Secs (249.234 Secs) *[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15917, NGC300-1 (03), implementation Wed Oct 09 19:00:25 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 27D TO 28 D

Fixed Targets

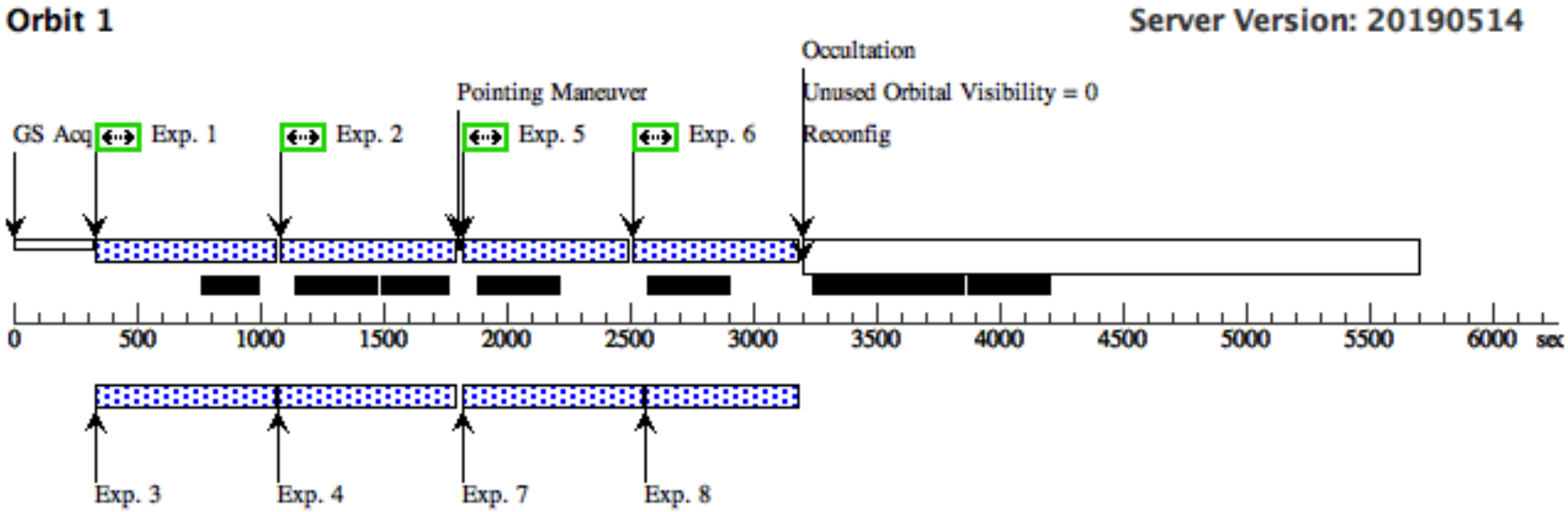
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	NGC300-1	RA: 00 54 6.9999 (13.5291663d) Dec: -37 33 19.61 (-37.55545d) Equinox: J2000	Epoch of Position: 2015.5	V=8.13	Reference Frame: SIMBAD

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[HALO]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F606W Dither 0	(3) NGC300-1	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0,0	Sequence 1-8 Non-Int in NGC300-1 (03) Prime + Parallel Group 1-4 in Sequence 1-8 Non-Int in NGC300-1 (03)	529 Secs (529 Secs) *[==>]*	***[1]***
2	F814W Dither 0	(3) NGC300-1	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0,0	Sequence 1-8 Non-Int in NGC300-1 (03) Prime + Parallel Group 1-4 in Sequence 1-8 Non-Int in NGC300-1 (03)	529 Secs (529 Secs) *[==>]*	***[1]***
3	F110W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-8 Non-Int in NGC300-1 (03) Prime + Parallel Group 1-4 in Sequence 1-8 Non-Int in NGC300-1 (03)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
4	F160WDither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-8 Non-Int in NGC300-1 (03) Prime + Parallel Group 1-4 in Sequence 1-8 Non-Int in NGC300-1 (03)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
5	F606W Dither 1	(3) NGC300-1	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.474,0.424	Sequence 1-8 Non-Int in NGC300-1 (03) Prime + Parallel Group 5-8 in Sequence 1-8 Non-Int in NGC300-1 (03)	495 Secs (495 Secs) *[==>]*	***[1]***
6	F814W Dither 1	(3) NGC300-1	ACS/WFC, ACCUM, WFCENTER	F814W		SAME POS AS 5	Sequence 1-8 Non-Int in NGC300-1 (03) Prime + Parallel Group 5-8 in Sequence 1-8 Non-Int in NGC300-1 (03)	495 Secs (495 Secs) *[==>]*	***[1]***
7	F110W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-8 Non-Int in NGC300-1 (03) Prime + Parallel Group 5-8 in Sequence 1-8 Non-Int in NGC300-1 (03)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
8	F160W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=STEP100		Sequence 1-8 Non-Int in NGC300-1 (03) Prime + Parallel Group 5-8 in Sequence 1-8 Non-Int in NGC300-1 (03)	599.232292 Secs (599.232 Secs) *[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15917, NGC300-2 (04), implementation Wed Oct 09 19:00:25 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 211D TO 212 D

Fixed Targets

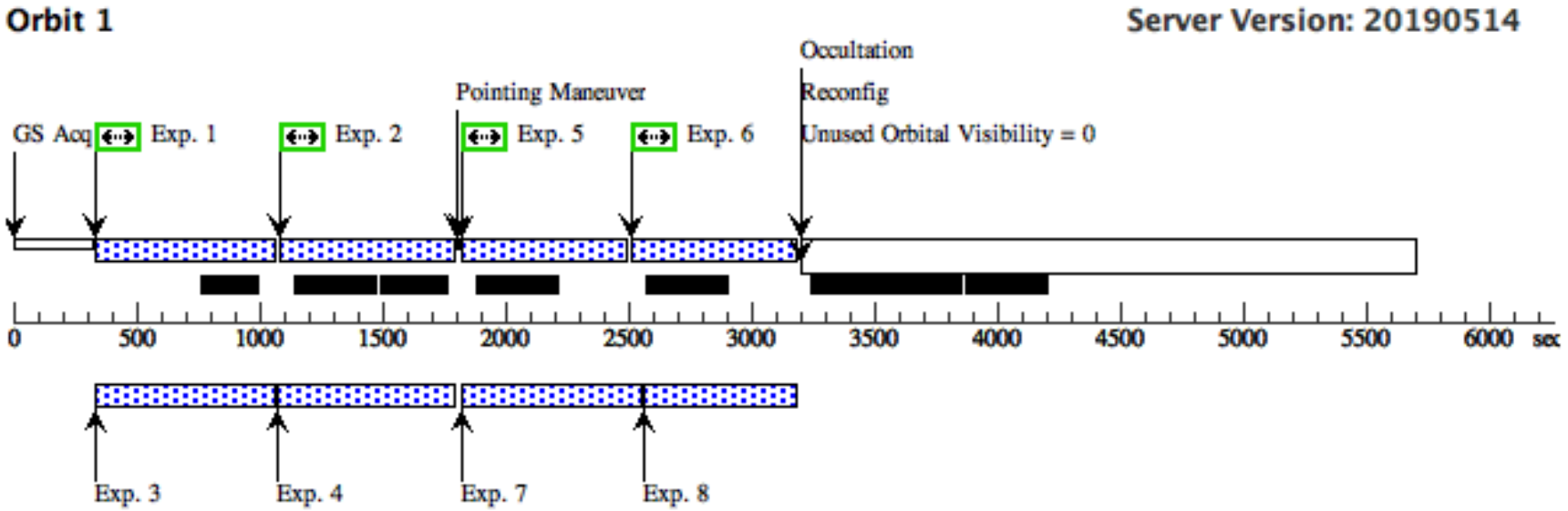
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	NGC300-2	RA: 00 54 36.6464 (13.6526933d) Dec: -37 31 45.20 (-37.52922d) Equinox: J2000	Epoch of Position: 2015.5	V=8.13	Reference Frame: SIMBAD

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[HALO]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F606W Dither 0	(4) NGC300-2	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0,0	Sequence 1-8 Non-Int in NGC300-2 (04) Prime + Parallel Group 1-4 in Sequence 1-8 Non-Int in NGC300-2 (04)	529 Secs (529 Secs) *[==>]*	***[1]***
2	F814W Dither 0	(4) NGC300-2	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0,0	Sequence 1-8 Non-Int in NGC300-2 (04) Prime + Parallel Group 1-4 in Sequence 1-8 Non-Int in NGC300-2 (04)	529 Secs (529 Secs) *[==>]*	***[1]***
3	F110W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-8 Non-Int in NGC300-2 (04) Prime + Parallel Group 1-4 in Sequence 1-8 Non-Int in NGC300-2 (04)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
4	F160W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-8 Non-Int in NGC300-2 (04) Prime + Parallel Group 1-4 in Sequence 1-8 Non-Int in NGC300-2 (04)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
5	F606W Dither 1	(4) NGC300-2	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.474,0.424	Sequence 1-8 Non-Int in NGC300-2 (04) Prime + Parallel Group 5-8 in Sequence 1-8 Non-Int in NGC300-2 (04)	495 Secs (495 Secs) *[==>]*	***[1]***
6	F814W Dither 1	(4) NGC300-2	ACS/WFC, ACCUM, WFCENTER	F814W		SAME POS AS 5	Sequence 1-8 Non-Int in NGC300-2 (04) Prime + Parallel Group 5-8 in Sequence 1-8 Non-Int in NGC300-2 (04)	495 Secs (495 Secs) *[==>]*	***[1]***
7	F110W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-8 Non-Int in NGC300-2 (04) Prime + Parallel Group 5-8 in Sequence 1-8 Non-Int in NGC300-2 (04)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
8	F160W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=STEP100		Sequence 1-8 Non-Int in NGC300-2 (04) Prime + Parallel Group 5-8 in Sequence 1-8 Non-Int in NGC300-2 (04)	599.232292 Secs (599.232 Secs) *[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15917, M81-1 (05), implementation Wed Oct 09 19:00:25 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 324D TO 325 D

Fixed Targets

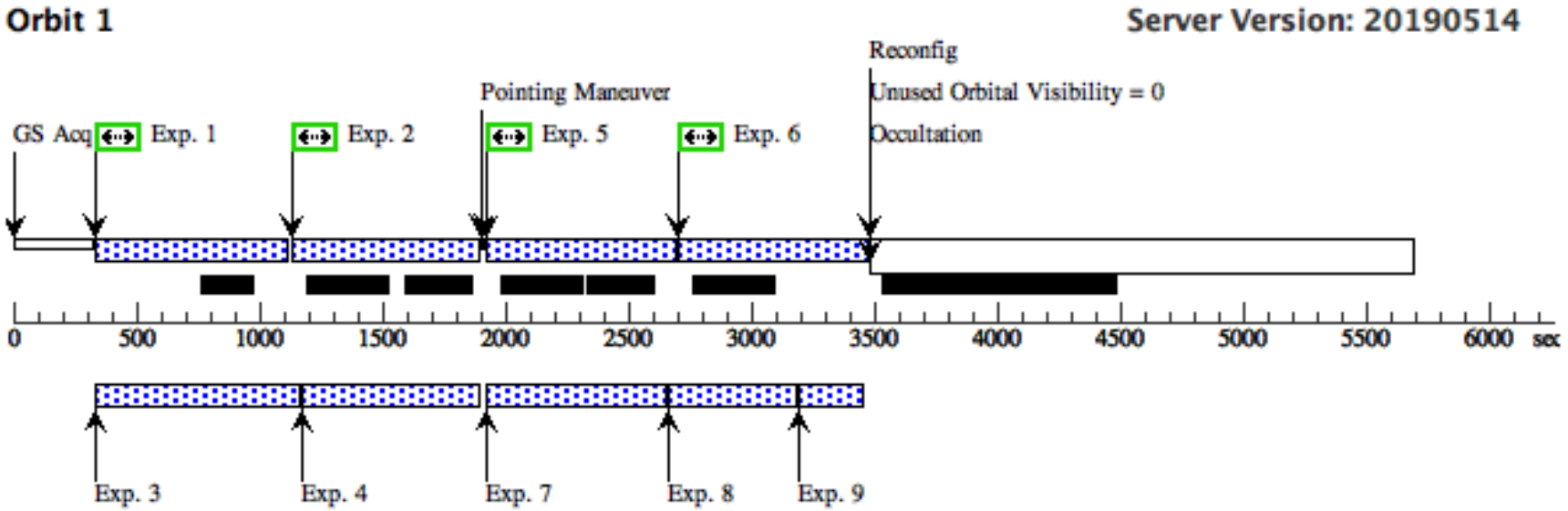
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	M81-1	RA: 09 57 34.9878 (149.3957825d) Dec: +69 00 25.71 (69.00714d) Equinox: J2000	Epoch of Position: 2015.5	V=6.94	Reference Frame: SIMBAD

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[HALO]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F606W Dither 0	(5) M81-1	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0,0	Sequence 1-9 Non-Int in M81-1 (05) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in M81-1 (05)	579 Secs (579 Secs) *[==>]*	***[1]***
2	F814W Dither 0	(5) M81-1	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0,0	Sequence 1-9 Non-Int in M81-1 (05) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in M81-1 (05)	579 Secs (579 Secs) *[==>]*	***[1]***
3	F110W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=11; SAMP-SEQ=STEP200		Sequence 1-9 Non-Int in M81-1 (05) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in M81-1 (05)	799.231201 Secs (799.231 Secs) *[==>]*	***[1]***
4	F160W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in M81-1 (05) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in M81-1 (05)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
5	F606W Dither 1	(5) M81-1	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.474,0.424	Sequence 1-9 Non-Int in M81-1 (05) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in M81-1 (05)	588 Secs (588 Secs) *[==>]*	***[1]***
6	F814W Dither 1	(5) M81-1	ACS/WFC, ACCUM, WFCENTER	F814W		SAME POS AS 5	Sequence 1-9 Non-Int in M81-1 (05) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in M81-1 (05)	588 Secs (588 Secs) *[==>]*	***[1]***
7	F110W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in M81-1 (05) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in M81-1 (05)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
8	F160W Dither 1.1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in M81-1 (05) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in M81-1 (05)	499.231969 Secs (499.232 Secs) *[==>]*	***[1]***
9	F160W Dither 1.2	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	SAMP-SEQ=STEP25; NSAMP=14		Sequence 1-9 Non-Int in M81-1 (05) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in M81-1 (05)	249.234346 Secs (249.234 Secs) *[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15917, M81-2 (06), implementation Wed Oct 09 19:00:25 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 147D TO 148 D

Fixed Targets

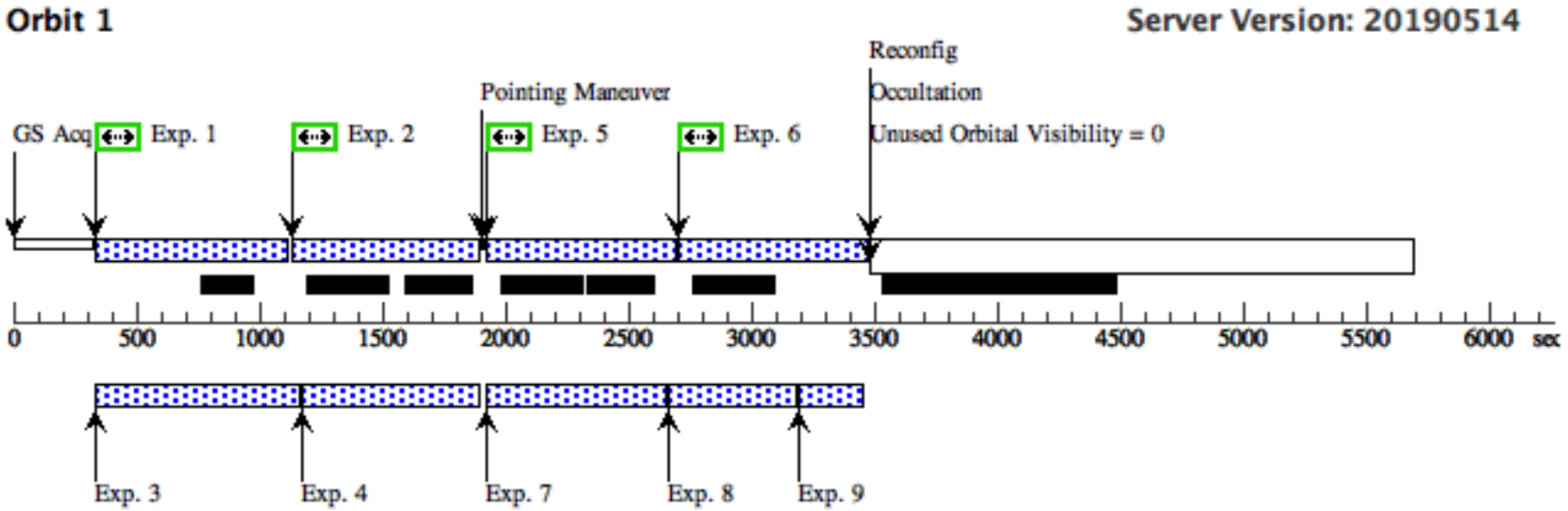
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	M81-2	RA: 09 57 50.2690 (149.4594542d) Dec: +69 06 16.42 (69.10456d) Equinox: J2000	Epoch of Position: 2015.5	V=6.94	Reference Frame: SIMBAD

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[HALO]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F606W Dither 0	(6) M81-2	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0,0	Sequence 1-9 Non-Int in M81-2 (06) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in M81-2 (06)	579 Secs (579 Secs) *[==>]*	***[1]***
2	F814W Dither 0	(6) M81-2	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0,0	Sequence 1-9 Non-Int in M81-2 (06) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in M81-2 (06)	579 Secs (579 Secs) *[==>]*	***[1]***
3	F110W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=11; SAMP-SEQ=STEP200		Sequence 1-9 Non-Int in M81-2 (06) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in M81-2 (06)	799.231201 Secs (799.231 Secs) *[==>]*	***[1]***
4	F160W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in M81-2 (06) Prime + Parallel Group 1-4 in Sequence 1-9 Non-Int in M81-2 (06)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
5	F606W Dither 1	(6) M81-2	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.474,0.424	Sequence 1-9 Non-Int in M81-2 (06) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in M81-2 (06)	588 Secs (588 Secs) *[==>]*	***[1]***
6	F814W Dither 1	(6) M81-2	ACS/WFC, ACCUM, WFCENTER	F814W		SAME POS AS 5	Sequence 1-9 Non-Int in M81-2 (06) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in M81-2 (06)	588 Secs (588 Secs) *[==>]*	***[1]***
7	F110W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in M81-2 (06) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in M81-2 (06)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
8	F160W Dither 1.1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in M81-2 (06) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in M81-2 (06)	499.231969 Secs (499.232 Secs) *[==>]*	***[1]***
9	F160W Dither 1.2	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	SAMP-SEQ=STEP25; NSAMP=14		Sequence 1-9 Non-Int in M81-2 (06) Prime + Parallel Group 5-9 in Sequence 1-9 Non-Int in M81-2 (06)	249.234346 Secs (249.234 Secs) *[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15917, NGC253-1 (07), implementation Wed Oct 09 19:00:25 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 66D TO 70 D

Fixed Targets

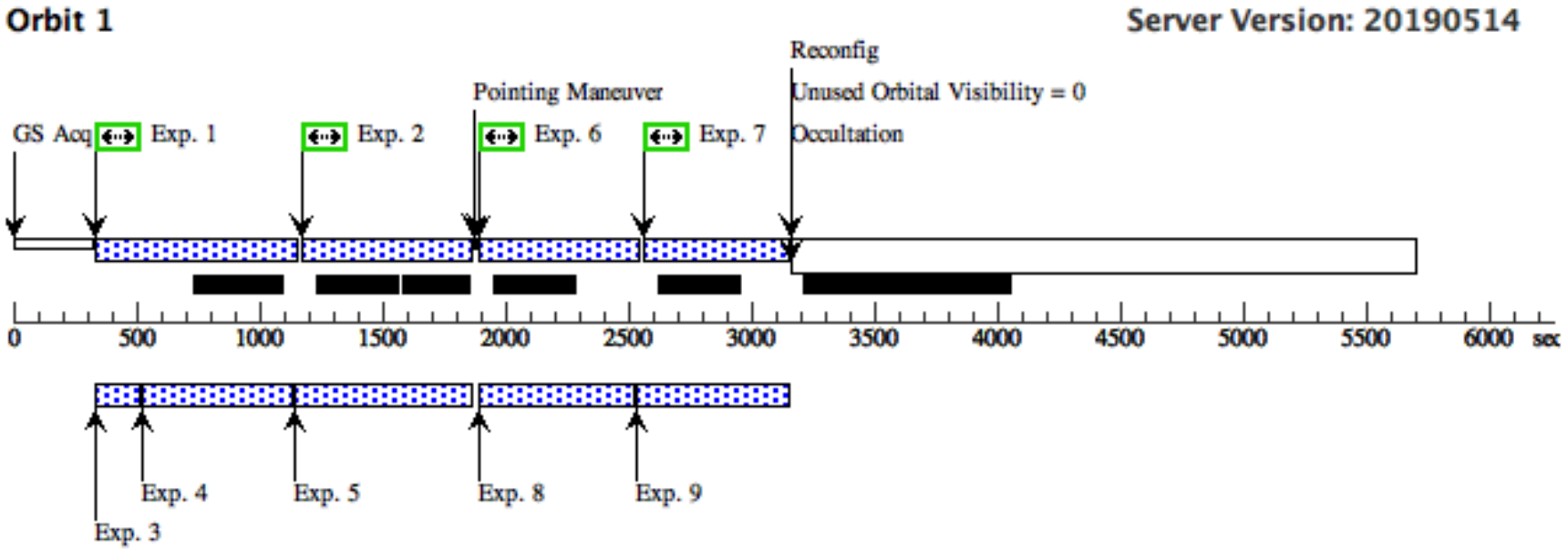
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	NGC253-1	RA: 00 46 16.5455 (11.5689396d) Dec: -25 27 54.12 (-25.46503d) Equinox: J2000	Epoch of Position: 2015.5	V=5.5	Reference Frame: SIMBAD

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[HALO]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F606W Dither 0	(7) NGC253-1	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0,0	Sequence 1-9 Non-Int in NGC253-1 (07) Prime + Parallel Group 1-5 in Sequence 1-9 Non-Int in NGC253-1 (07)	619 Secs (619 Secs) *[==>]*	***[1]***
2	F814W Dither 0	(7) NGC253-1	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0,0	Sequence 1-9 Non-Int in NGC253-1 (07) Prime + Parallel Group 1-5 in Sequence 1-9 Non-Int in NGC253-1 (07)	509 Secs (509 Secs) *[==>]*	***[1]***
3	F110W Dither 0.1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	SAMP-SEQ=STEP50; NSAMP=8		Sequence 1-9 Non-Int in NGC253-1 (07) Prime + Parallel Group 1-5 in Sequence 1-9 Non-Int in NGC253-1 (07)	149.231128 Secs (149.231 Secs) *[==>]*	***[1]***
4	F110W Dither 0.2	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=10; SAMP-SEQ=STEP200		Sequence 1-9 Non-Int in NGC253-1 (07) Prime + Parallel Group 1-5 in Sequence 1-9 Non-Int in NGC253-1 (07)	599.231134 Secs (599.231 Secs) *[==>]*	***[1]***
5	F160W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in NGC253-1 (07) Prime + Parallel Group 1-5 in Sequence 1-9 Non-Int in NGC253-1 (07)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
6	F606W Dither 1	(7) NGC253-1	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.474,0.424	Sequence 1-9 Non-Int in NGC253-1 (07) Prime + Parallel Group 6-9 in Sequence 1-9 Non-Int in NGC253-1 (07)	476 Secs (476 Secs) *[==>]*	***[1]***
7	F814W Dither 1	(7) NGC253-1	ACS/WFC, ACCUM, WFCENTER	F814W		SAME POS AS 6	Sequence 1-9 Non-Int in NGC253-1 (07) Prime + Parallel Group 6-9 in Sequence 1-9 Non-Int in NGC253-1 (07)	409 Secs (409 Secs) *[==>]*	***[1]***
8	F110W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=10; SAMP-SEQ=STEP200		Sequence 1-9 Non-Int in NGC253-1 (07) Prime + Parallel Group 6-9 in Sequence 1-9 Non-Int in NGC253-1 (07)	599.231134 Secs (599.231 Secs) *[==>]*	***[1]***
9	F160W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=10; SAMP-SEQ=STEP200		Sequence 1-9 Non-Int in NGC253-1 (07) Prime + Parallel Group 6-9 in Sequence 1-9 Non-Int in NGC253-1 (07)	599.231134 Secs (599.231 Secs) *[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15917, NGC253-2 (08), implementation Wed Oct 09 19:00:25 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 246D TO 250 D

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	NGC253-2	RA: 00 46 40.8769 (11.6703204d) Dec: -25 30 27.46 (-25.50763d) Equinox: J2000	Epoch of Position: 2015.5	V=5.5	Reference Frame: SIMBAD

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[HALO]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F606W Dither 0	(8) NGC253-2	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0,0	Sequence 1-9 Non-Int in NGC253-2 (08) Prime + Parallel Group 1-5 in Sequence 1-9 Non-Int in NGC253-2 (08)	619 Secs (619 Secs) *[==>]*	***[1]***
2	F814W Dither 0	(8) NGC253-2	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0,0	Sequence 1-9 Non-Int in NGC253-2 (08) Prime + Parallel Group 1-5 in Sequence 1-9 Non-Int in NGC253-2 (08)	509 Secs (509 Secs) *[==>]*	***[1]***
3	F110W Dither 0.1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	SAMP-SEQ=STEP50; NSAMP=8		Sequence 1-9 Non-Int in NGC253-2 (08) Prime + Parallel Group 1-5 in Sequence 1-9 Non-Int in NGC253-2 (08)	149.231128 Secs (149.231 Secs) *[==>]*	***[1]***
4	F110W Dither 0.2	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=10; SAMP-SEQ=STEP200		Sequence 1-9 Non-Int in NGC253-2 (08) Prime + Parallel Group 1-5 in Sequence 1-9 Non-Int in NGC253-2 (08)	599.231134 Secs (599.231 Secs) *[==>]*	***[1]***
5	F160W Dither 0	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=13; SAMP-SEQ=STEP100		Sequence 1-9 Non-Int in NGC253-2 (08) Prime + Parallel Group 1-5 in Sequence 1-9 Non-Int in NGC253-2 (08)	699.232615 Secs (699.233 Secs) *[==>]*	***[1]***
6	F606W Dither 1	(8) NGC253-2	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.474,0.424	Sequence 1-9 Non-Int in NGC253-2 (08) Prime + Parallel Group 6-9 in Sequence 1-9 Non-Int in NGC253-2 (08)	476 Secs (476 Secs) *[==>]*	***[1]***
7	F814W Dither 1	(8) NGC253-2	ACS/WFC, ACCUM, WFCENTER	F814W		SAME POS AS 6	Sequence 1-9 Non-Int in NGC253-2 (08) Prime + Parallel Group 6-9 in Sequence 1-9 Non-Int in NGC253-2 (08)	409 Secs (409 Secs) *[==>]*	***[1]***
8	F110W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F110W	NSAMP=10; SAMP-SEQ=STEP200		Sequence 1-9 Non-Int in NGC253-2 (08) Prime + Parallel Group 6-9 in Sequence 1-9 Non-Int in NGC253-2 (08)	599.231134 Secs (599.231 Secs) *[==>]*	***[1]***
9	F160W Dither 1	ANY	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=10; SAMP-SEQ=STEP200		Sequence 1-9 Non-Int in NGC253-2 (08) Prime + Parallel Group 6-9 in Sequence 1-9 Non-Int in NGC253-2 (08)	599.231134 Secs (599.231 Secs) *[==>]*	***[1]***

Orbit Structure