



16185 - Resolving Star Formation Triggered by M82's Prototypical Superwind

Cycle: 28, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. Adam Smercina (PI) (Contact)	University of Washington	asmerci@uw.edu
Prof. Eric F. Bell (CoI)	University of Michigan	ericbell@umich.edu
Dr. Richard D'Souza (CoI)	Vatican Observatory	rdsouza@specola.va
Dr. Daniel R. Weisz (CoI)	University of California - Berkeley	dan.weisz@berkeley.edu
Dr. Andrew Eugene Dolphin (CoI)	Raytheon Company	adolphin@raytheon.com
Dr. Fabian Walter (CoI) (ESA Member)	Max-Planck-Institut für Astronomie, Heidelberg	walter@mpia.de
Dr. Erwin de Blok (CoI) (ESA Member)	Stichting Astronomisch Onderzoek in Nederland (ASTRON)	edeblok@ast.uc.ac.za
Prof. Antonela Monachesi (CoI)	Universidad de La Serena	amonachesi@userena.cl
Prof. Jeremy Bailin (CoI)	University of Alabama	jbailin@ua.edu
Dr. Roelof S. de Jong (CoI) (ESA Member)	Leibniz-Institut für Astrophysik Potsdam (AIP)	rdejong@aip.de
Dr. In Sung Jang (CoI) (ESA Member)	Leibniz-Institut für Astrophysik Potsdam (AIP)	isjang@aip.de
Dr. Julianne Dalcanton (CoI)	University of Washington	jd@astro.washington.edu
Dr. Benjamin F. Williams (CoI)	University of Washington	ben@astro.washington.edu

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) M82-FIELD1 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:20.0	yes
02	(1) M82-FIELD1 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:21.0	yes

Proposal 16185 (STScI Edit Number: 1, Created: Tuesday, August 17, 2021 at 3:00:32 PM Eastern Standard Time) - Overview

<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>
03	(1) M82-FIELD1 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:22.0	yes
04	(1) M82-FIELD1 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:23.0	yes
05	(2) M82-FIELD2 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:24.0	yes
06	(2) M82-FIELD2 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:24.0	yes
07	(2) M82-FIELD2 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:25.0	yes
08	(2) M82-FIELD2 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:26.0	yes
09	(3) M82-FIELD3 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:27.0	yes
10	(3) M82-FIELD3 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:28.0	yes
11	(3) M82-FIELD3 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:28.0	yes
12	(3) M82-FIELD3 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:29.0	yes
52	(1) M82-FIELD1 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:30.0	yes
59	(3) M82-FIELD3 ANY	ACS/WFC WFC3/UVIS	1	17-Aug-2021 16:00:31.0	yes

14 Total Orbits Used

ABSTRACT

Starbursts, and their powerful galactic-scale outflows, are an important mode of galaxy evolution. Yet, owing to their frequently large distances, we understand little about how these starburst-driven outflows operate. Star formation in these outflows, previously observed indirectly using spectral decomposition, and predicted in models, is an as-yet untapped, powerful tracer of the complex physics governing these winds. Resolved star formation triggered within a starburst-driven outflow has now been observed for the first time in M82's prototypical superwind. Deep wide-field imaging has revealed that the wind-induced stellar populations extend in a trail, well beyond M82's disk, displaying an apparent age gradient. This 'trail of breadcrumbs' tantalizingly encodes the history of M82's outflow.

As the first-ever detection of this phenomenon, M82's outflow-formed stars present an entirely new lens to study its prototypical outflow, and a singularly unique opportunity to constrain outflow physics. We propose an efficient, 12 orbit coordinated WFC3/ACS survey of M82's trail of star formation in the F475W & F814W filters. This program will allow us to measure the outflow's star formation history (SFH) within the last 300 Myr. Using this SFH, we will place the first-ever stringent constraints on (1) the outflow timescale, (2) the mass outflow history, and (3) the total amount of stellar material contributed by the outflow to the stellar halo. This exquisite dataset will have tremendous legacy potential as a stellar catalog for spectroscopic follow-up, and will serve as a case study of this likely ubiquitous, yet poorly understood, astrophysical process.

OBSERVING DESCRIPTION

In order to maximize scheduling, the 12 orbits are organized into 12 individual visits; 4 visits per WFC3+ACS pointing. F475W and F814W exposures are distributed across each set of 4 visits to optimize detection of sources with main-sequence stellar colors, amounting to a 33/67 split in exposure time. A 3 degree ORIENT range (182-185 deg) is given for the first visit of each target, chosen to allow maximum schedulability, while avoiding overlaps between ACS parallels and subsequent WFC3 prime pointings. To achieve equivalent depth for both prime (WFC3) and parallel (ACS) fields, each subsequent visit (for each target) is set to the same ORIENT as this first visit. The visits execution order is set, using Timing Requirements, to maintain ~equivalent depth in each filter sufficient to detect sources with main-sequence stellar colors at any point during the program. This visit ordering ensures that the data will be scientifically valuable, even if the full program is unable to be executed for any reason.

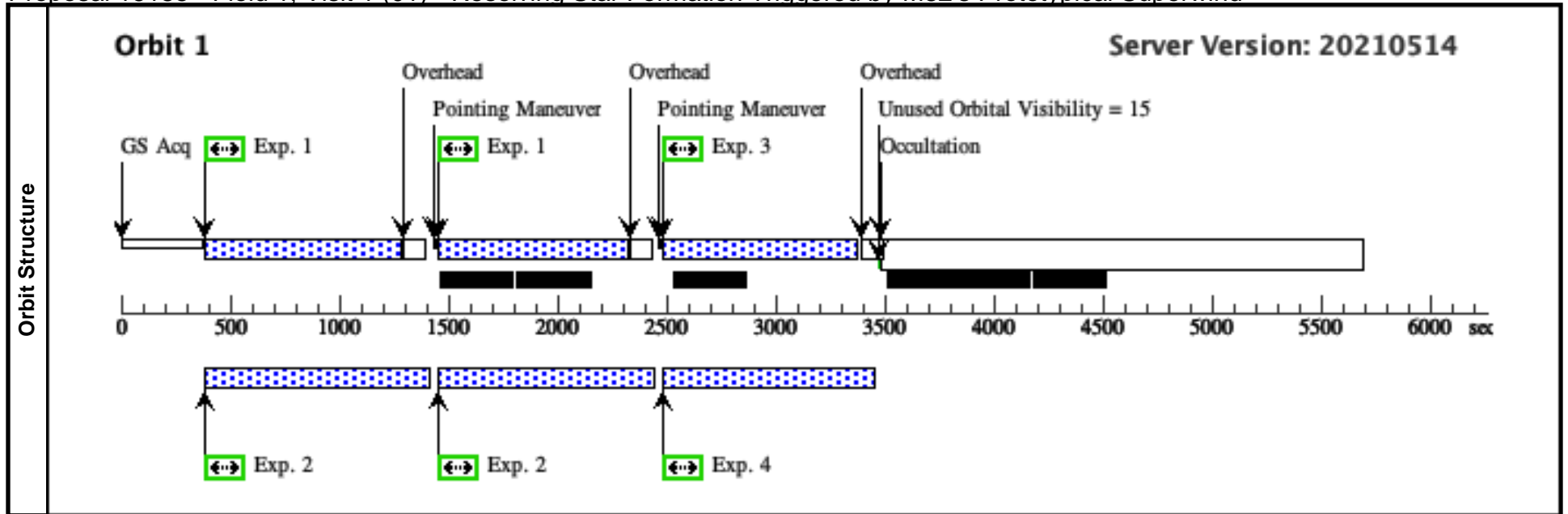
3 of the 4 visits (Field N, Visit 2,3,4) for each M82 field, which contain exposures in only one filter, consist of 3-point dither patterns, spaced spaced at 2.98" to provide ~1/2 pixel sub-sampling of the PSF. One visit per field (Field N, Visit 1) mixes F475W and F814W exposures for WFC3. These visits include two dithers in F814W, separated in a line by 2.98" and offset from the target center by 0.98" in X and Y, as well as a single F475W exposure. The resulting total dither pattern, for both F475W and F814W, fully samples both WFC3 and ACS chip gaps, will allow robust cosmic ray rejection, and, along with sub-pixel dither spacing, will produce a well-sampled PSF.

Proposal 16185 - Field 1, Visit 1 (01) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Visit	Proposal 16185, Field 1, Visit 1 (01), completed Tue Aug 17 20:00:32 GMT 2021 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 182D TO 185 D					
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures	
(2)		Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=2.98 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)	M82-FIELD1	RA: 09 56 21.0298 (149.0876242d) Dec: +69 36 50.90 (69.61414d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS
<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]						

Proposal 16185 - Field 1, Visit 1 (01) - Resolving Star Formation Triggered by M82's Prototypical Superwind

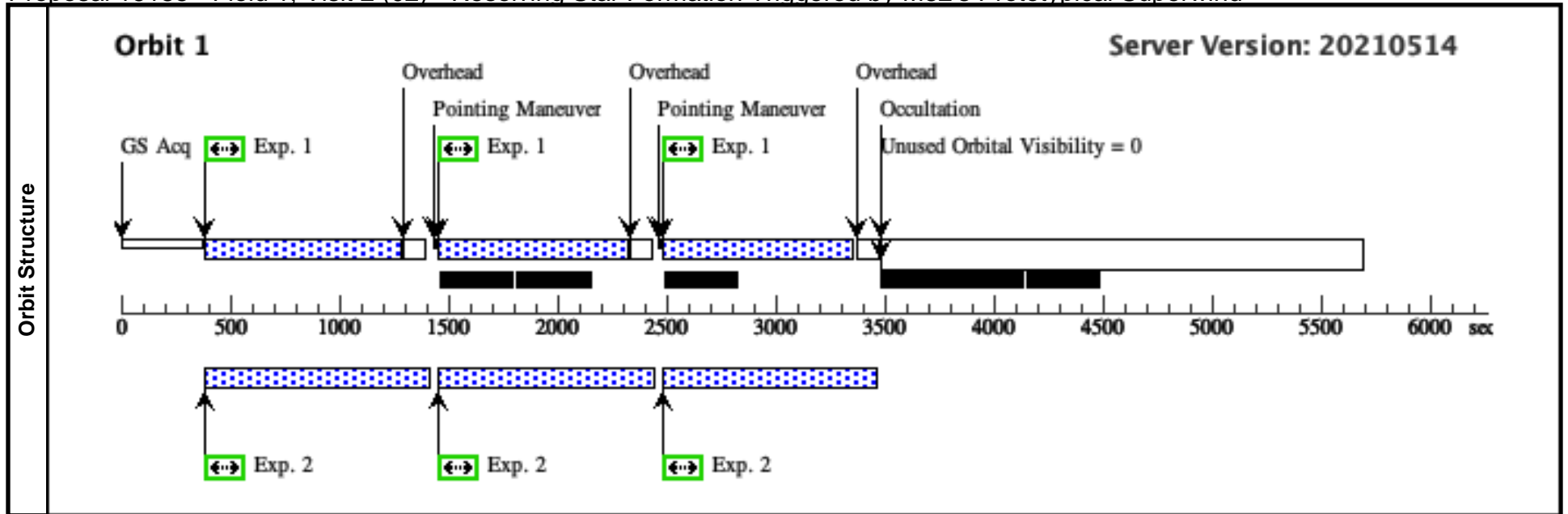
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
Exposures	1	(1) M82-FIELD1	WFC3/UVIS, ACCUM, UVIS	F814W		POS TARG 0.98,0.98	Sequence 1-4 Non-Int in Field 1, Visit 1 (01) Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 1, Visit 1 (01) (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 1, Visit 1 (01)	888 Secs (1738 Secs) [==>869.0 Secs (Pattern 1)] [==>869.0 Secs (Pattern 2)]	[1]
	2	ANY	ACS/WFC, ACCUM, WFC	F814W			Sequence 1-4 Non-Int in Field 1, Visit 1 (01) Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 1, Visit 1 (01) (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 1, Visit 1 (01)	870 Secs (1698 Secs) [==>828.0 Secs (Pattern 1)] [==>870.0 Secs (Pattern 2)]	[1]
	3	(1) M82-FIELD1	WFC3/UVIS, ACCUM, UVIS	F475W			Sequence 1-4 Non-Int in Field 1, Visit 1 (01) Prime + Parallel Group 3-4 in Sequence 1-4 Non-Int in Field 1, Visit 1 (01)	888 Secs (869 Secs) [==>869.0 Secs]	[1]
	4	ANY	ACS/WFC, ACCUM, WFC	F475W			Sequence 1-4 Non-Int in Field 1, Visit 1 (01) Prime + Parallel Group 3-4 in Sequence 1-4 Non-Int in Field 1, Visit 1 (01)	870 Secs (804 Secs) [==>804.0 Secs]	[1]



Proposal 16185 - Field 1, Visit 2 (02) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Tue Aug 17 20:00:32 GMT 2021

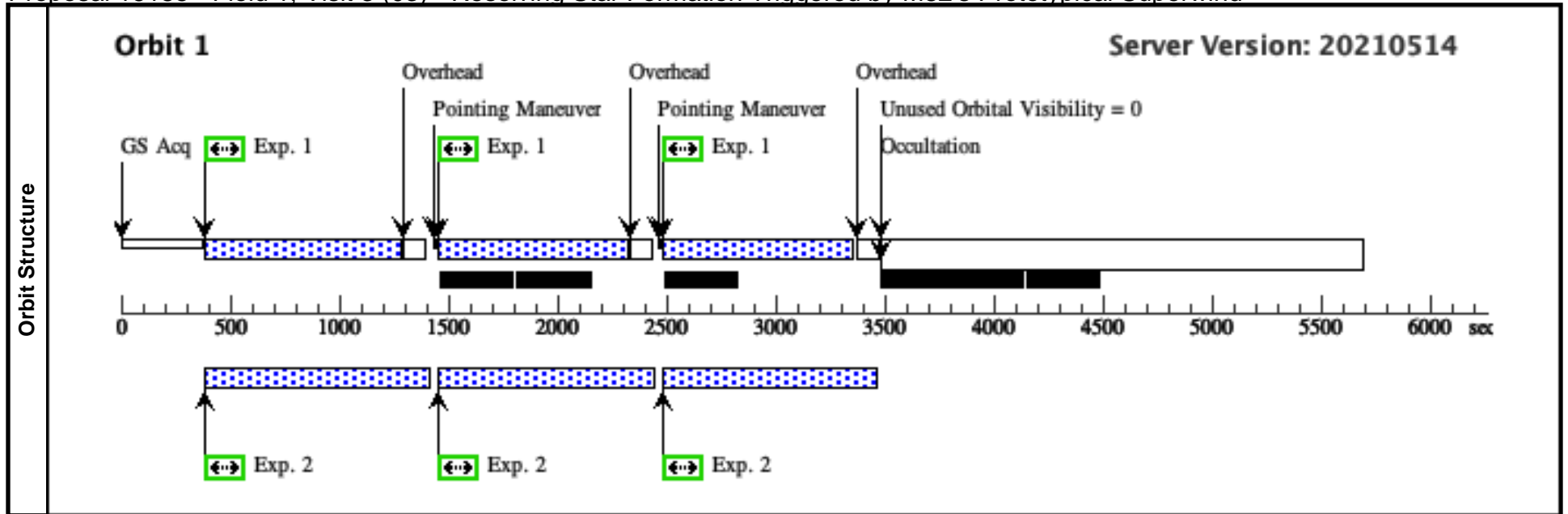
Visit	Proposal 16185, Field 1, Visit 2 (02), failed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 01; AFTER 01									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=2.98 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)	M82-FIELD1	RA: 09 56 21.0298 (149.0876242d) Dec: +69 36 50.90 (69.61414d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) M82-FIELD1	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-2 Non-Int in Field 1, Visit 2 (02) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 2 (02) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 2 (02)	888 Secs (2613 Secs) [==>871.0 Secs (Pattern 1)] [==>871.0 Secs (Pattern 2)] [==>871.0 Secs (Pattern 3)]	[1]
	2		ANY	ACS/WFC, ACCUM, WFC	F814W			Sequence 1-2 Non-Int in Field 1, Visit 2 (02) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 2 (02) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 2 (02)	870 Secs (2559 Secs) [==>828.0 Secs (Pattern 1)] [==>(Pattern 2)] [==>861.0 Secs (Pattern 3)]	[1]



Proposal 16185 - Field 1, Visit 3 (03) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Tue Aug 17 20:00:32 GMT 2021

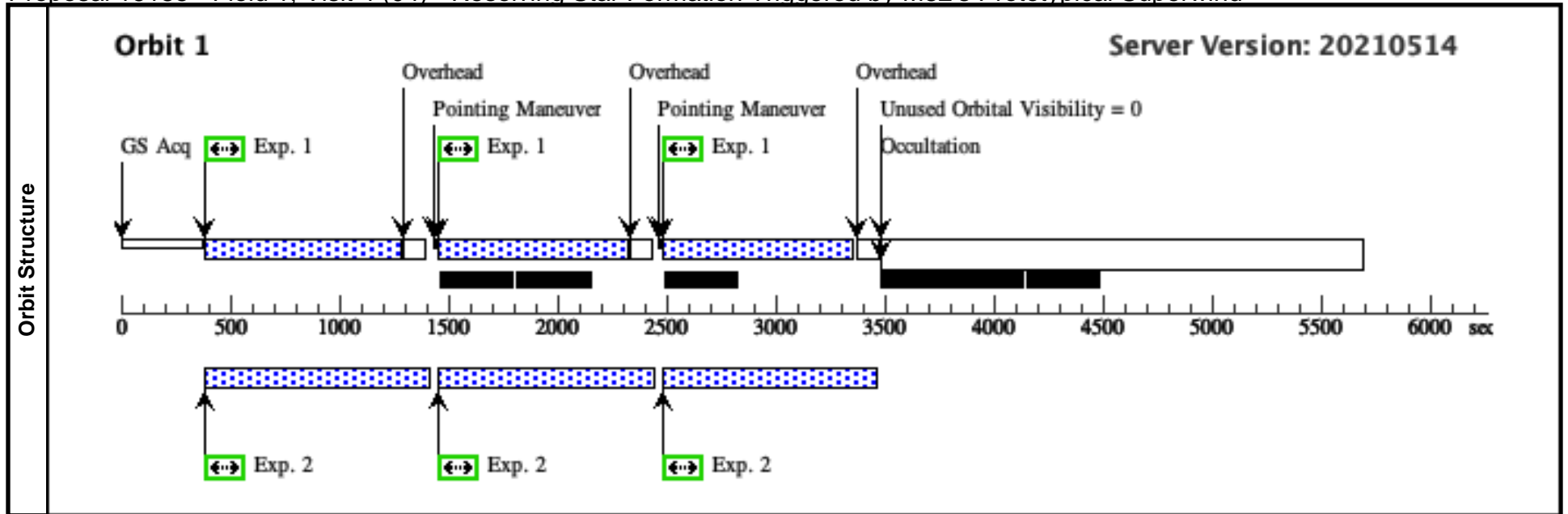
Visit	Proposal 16185, Field 1, Visit 3 (03), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 01; AFTER 02									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=2.98 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)	M82-FIELD1	RA: 09 56 21.0298 (149.0876242d) Dec: +69 36 50.90 (69.61414d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) M82-FIELD1	WFC3/UVIS, ACCUM, UVIS	F475W			Sequence 1-2 Non-Int in Field 1, Visit 3 (03) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 3 (03) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 3 (03)	888 Secs (2613 Secs) [==>871.0 Secs (Pattern 1)] [==>871.0 Secs (Pattern 2)] [==>871.0 Secs (Pattern 3)]	[1]
	2		ANY	ACS/WFC, ACCUM, WFC	F475W			Sequence 1-2 Non-Int in Field 1, Visit 3 (03) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 3 (03) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 3 (03)	870 Secs (2559 Secs) [==>828.0 Secs (Pattern 1)] [==>(Pattern 2)] [==>861.0 Secs (Pattern 3)]	[1]



Proposal 16185 - Field 1, Visit 4 (04) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Tue Aug 17 20:00:32 GMT 2021

Visit	Proposal 16185, Field 1, Visit 4 (04), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 01; AFTER 03									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=2.98 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)	M82-FIELD1	RA: 09 56 21.0298 (149.0876242d) Dec: +69 36 50.90 (69.61414d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) M82-FIELD1	WFC3/UVIS, ACCUM, UVIS	F814W				Sequence 1-2 Non-Int in Field 1, Visit 4 (04) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 4 (04) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 4 (04)	888 Secs (2613 Secs) [==>871.0 Secs (Pattern 1)] [==>871.0 Secs (Pattern 2)] [==>871.0 Secs (Pattern 3)]
2		ANY	ACS/WFC, ACCUM, WFC	F814W				Sequence 1-2 Non-Int in Field 1, Visit 4 (04) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 4 (04) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 4 (04)	870 Secs (2559 Secs) [==>828.0 Secs (Pattern 1)] [==>(Pattern 2)] [==>861.0 Secs (Pattern 3)]	[1]

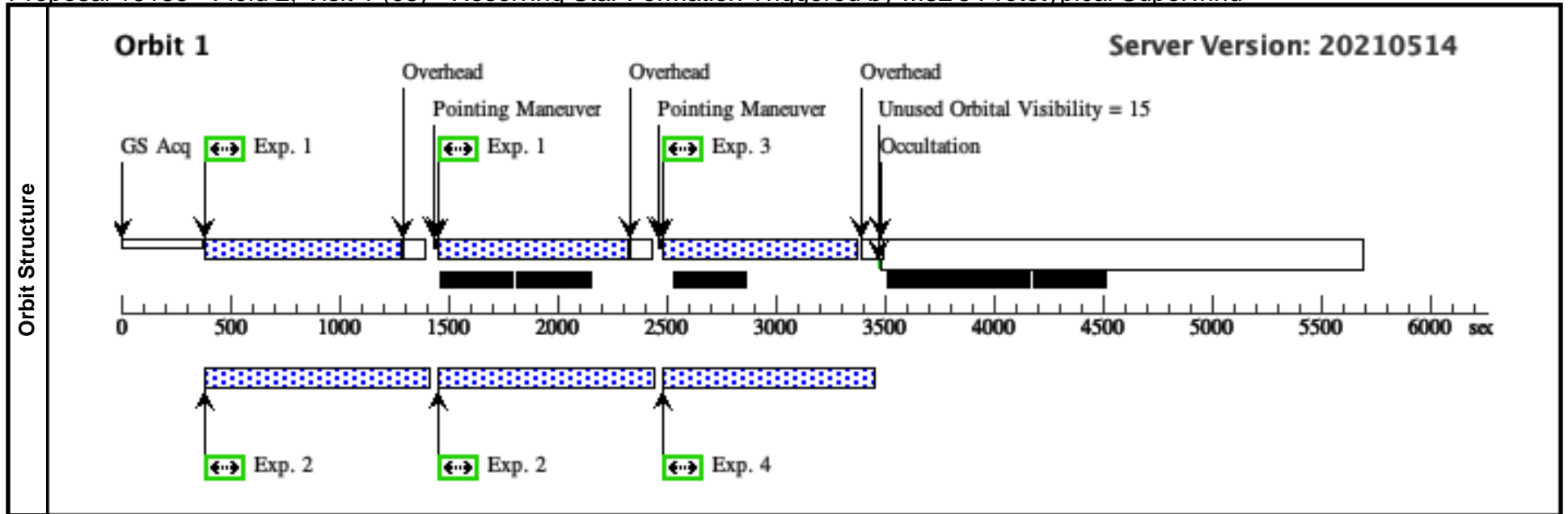


Proposal 16185 - Field 2, Visit 1 (05) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Visit	Proposal 16185, Field 2, Visit 1 (05), completed Tue Aug 17 20:00:32 GMT 2021 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 182D TO 185 D					
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures	
(2)		Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=2.98 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)	M82-FIELD2	RA: 09 57 30.9472 (149.3789467d) Dec: +69 37 40.97 (69.62805d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS
<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]						

Proposal 16185 - Field 2, Visit 1 (05) - Resolving Star Formation Triggered by M82's Prototypical Superwind

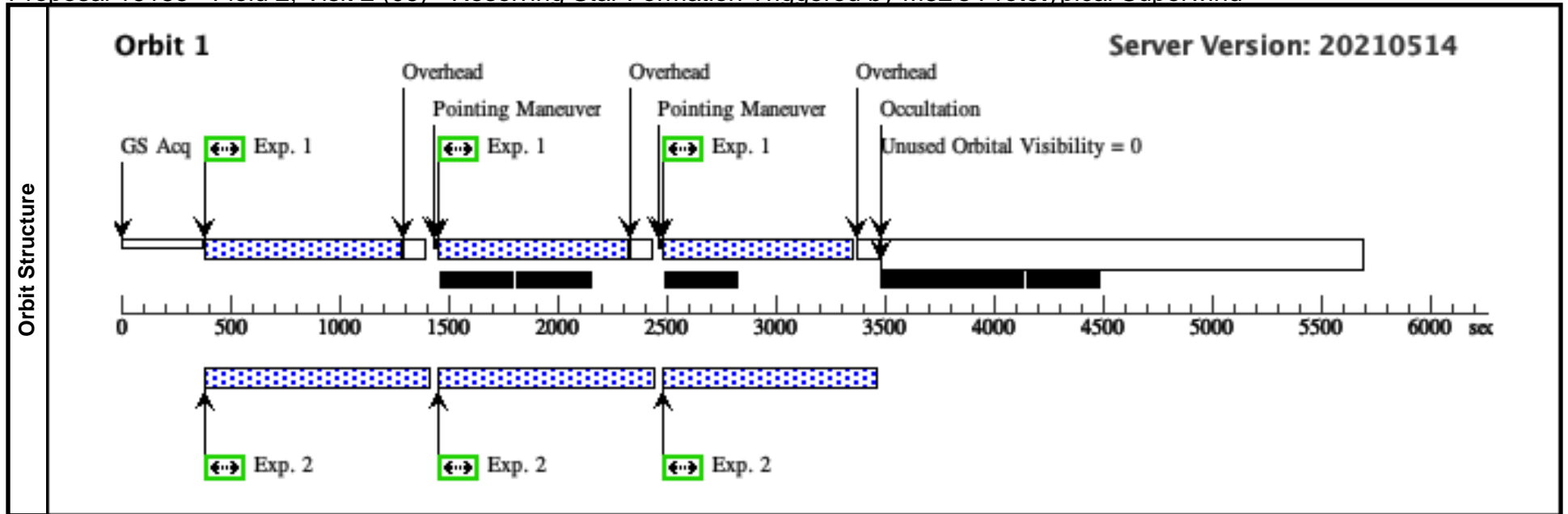
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(2) M82-FIELD2	WFC3/UVIS, ACCUM, UVIS	F814W		POS TARG 0.98,0.98	Sequence 1-4 Non-Int in Field 2, Visit 1 (05)	888 Secs (1738 Secs)	
								Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 2, Visit 1 (05) (2)	[==>869.0 Secs (Pattern 1)]	
								Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 2, Visit 1 (05)	[==>869.0 Secs (Pattern 2)]	[1]
2		ANY	ACS/WFC, ACCUM, WFC	F814W			Sequence 1-4 Non-Int in Field 2, Visit 1 (05)	870 Secs (1698 Secs)		
							Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 2, Visit 1 (05) (2)	[==>828.0 Secs (Pattern 1)]		
							Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 2, Visit 1 (05)	[==>870 Secs (Pattern 2)]	[1]	
3		(2) M82-FIELD2	WFC3/UVIS, ACCUM, UVIS	F475W			Sequence 1-4 Non-Int in Field 2, Visit 1 (05)	888 Secs (869 Secs)		
							Prime + Parallel Group 3-4 in Sequence 1-4 Non-Int in Field 2, Visit 1 (05)	[==>869.0 Secs]	[1]	
4		ANY	ACS/WFC, ACCUM, WFC	F475W			Sequence 1-4 Non-Int in Field 2, Visit 1 (05)	870 Secs (804 Secs)		
							Prime + Parallel Group 3-4 in Sequence 1-4 Non-Int in Field 2, Visit 1 (05)	[==>804.0 Secs]	[1]	



Proposal 16185 - Field 2, Visit 2 (06) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Tue Aug 17 20:00:32 GMT 2021

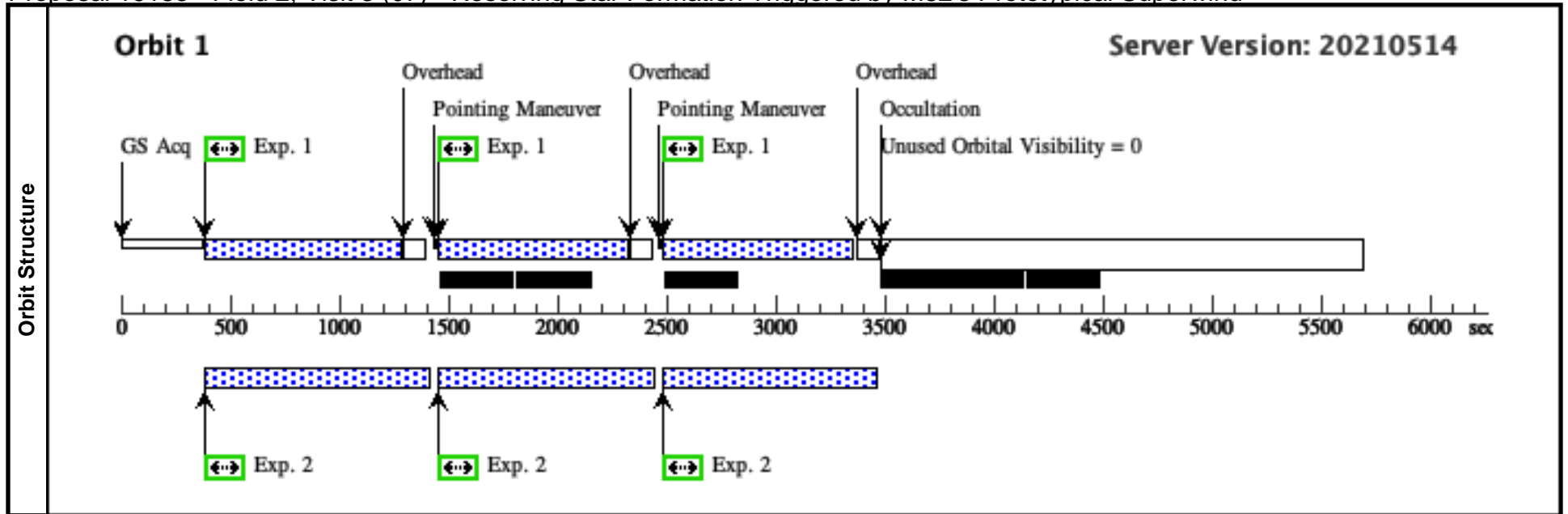
Visit	Proposal 16185, Field 2, Visit 2 (06), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 05; AFTER 05									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=2.98 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)	M82-FIELD2	RA: 09 57 30.9472 (149.3789467d) Dec: +69 37 40.97 (69.62805d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(2) M82-FIELD2	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-2 Non-Int in Field 2, Visit 2 (06) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 2 (06) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 2 (06)	888 Secs (2613 Secs) [==>871.0 Secs (Pattern 1)] [==>871.0 Secs (Pattern 2)] [==>871.0 Secs (Pattern 3)]	[1]
	2		ANY	ACS/WFC, ACCUM, WFC	F814W			Sequence 1-2 Non-Int in Field 2, Visit 2 (06) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 2 (06) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 2 (06)	870 Secs (2559 Secs) [==>828.0 Secs (Pattern 1)] [==>(Pattern 2)] [==>861.0 Secs (Pattern 3)]	[1]



Proposal 16185 - Field 2, Visit 3 (07) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Tue Aug 17 20:00:32 GMT 2021

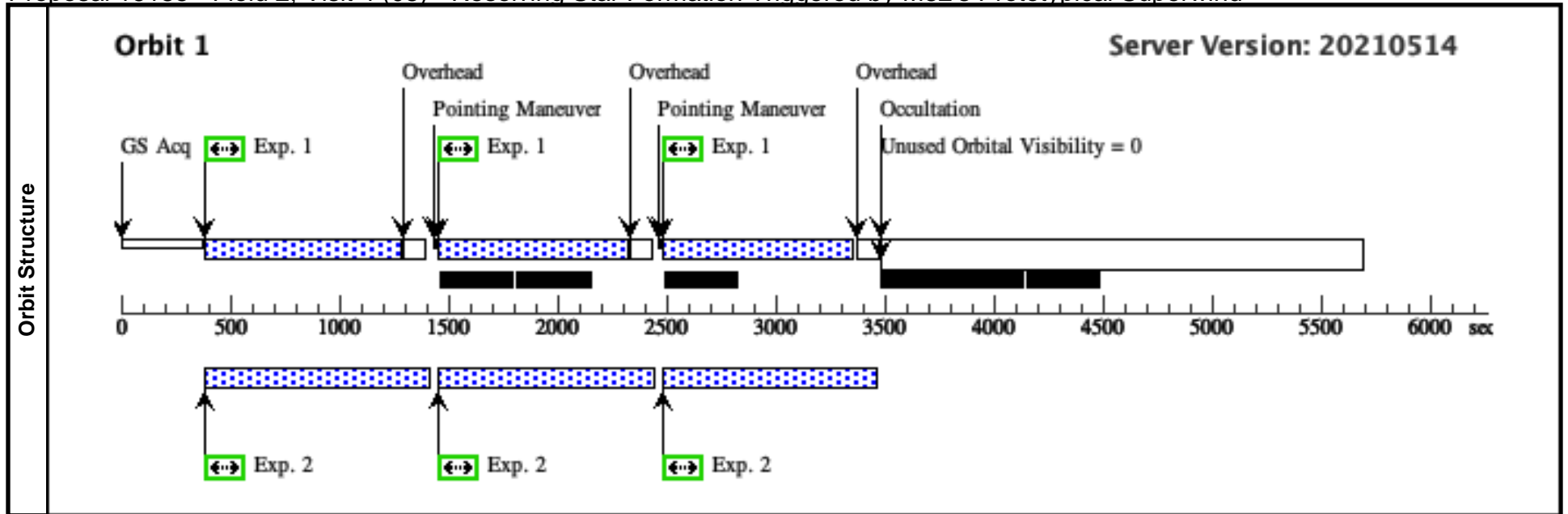
Visit	Proposal 16185, Field 2, Visit 3 (07), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 05; AFTER 06									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=2.98 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)	M82-FIELD2	RA: 09 57 30.9472 (149.3789467d) Dec: +69 37 40.97 (69.62805d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(2) M82-FIELD2	WFC3/UVIS, ACCUM, UVIS	F475W				Sequence 1-2 Non-Int in Field 2, Visit 3 (07) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 3 (07) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 3 (07)	888 Secs (2613 Secs) [==>871.0 Secs (Pattern 1)] [==>871.0 Secs (Pattern 2)] [==>871.0 Secs (Pattern 3)]
2		ANY		ACS/WFC, ACCUM, WFC	F475W			Sequence 1-2 Non-Int in Field 2, Visit 3 (07) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 3 (07) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 3 (07)	870 Secs (2559 Secs) [==>828.0 Secs (Pattern 1)] [==>(Pattern 2)] [==>861.0 Secs (Pattern 3)]	[1]



Proposal 16185 - Field 2, Visit 4 (08) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Tue Aug 17 20:00:32 GMT 2021

Visit	Proposal 16185, Field 2, Visit 4 (08), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 05; AFTER 07									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=2.98 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)	M82-FIELD2	RA: 09 57 30.9472 (149.3789467d) Dec: +69 37 40.97 (69.62805d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(2) M82-FIELD2	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-2 Non-Int in Field 2, Visit 4 (08) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 4 (08) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 4 (08)	888 Secs (2613 Secs) [==>871.0 Secs (Pattern 1)] [==>871.0 Secs (Pattern 2)] [==>871.0 Secs (Pattern 3)]	[1]
	2	ANY		ACS/WFC, ACCUM, WFC	F814W			Sequence 1-2 Non-Int in Field 2, Visit 4 (08) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 4 (08) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 2, Visit 4 (08)	870 Secs (2559 Secs) [==>828.0 Secs (Pattern 1)] [==>(Pattern 2)] [==>861.0 Secs (Pattern 3)]	[1]

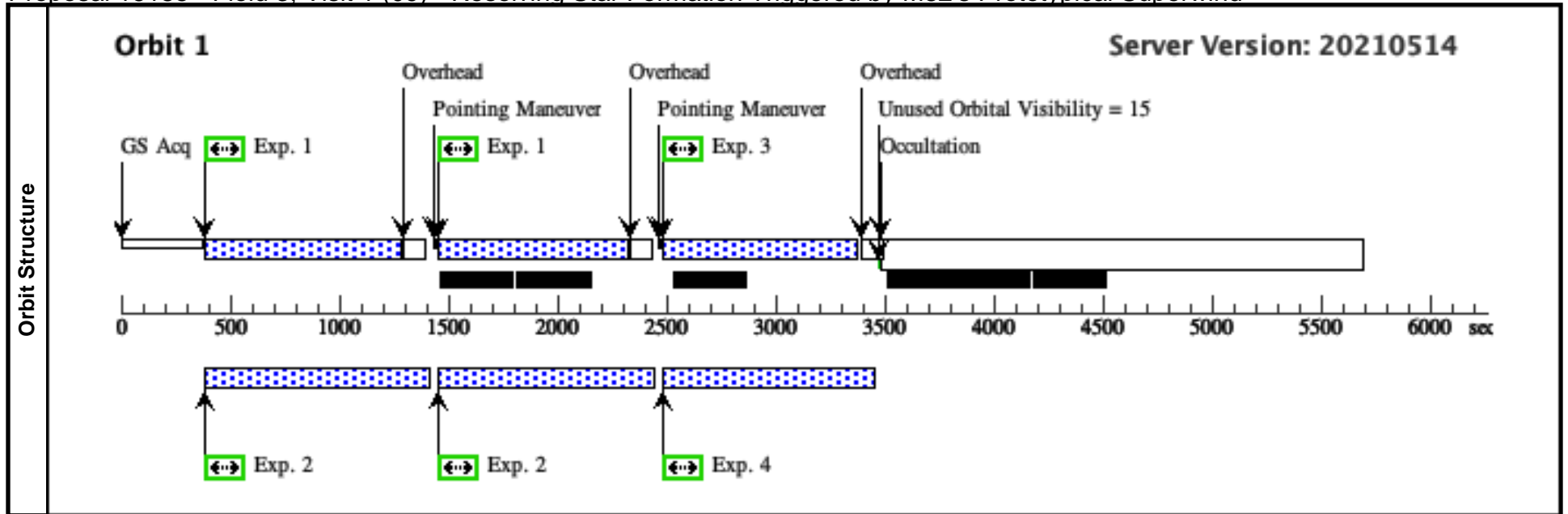


Proposal 16185 - Field 3, Visit 1 (09) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Visit	Proposal 16185, Field 3, Visit 1 (09), failed Tue Aug 17 20:00:32 GMT 2021 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 182D TO 185 D					
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures	
	(2)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=2.98 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
	(3)	M82-FIELD3	RA: 09 58 46.3483 (149.6931179d) Dec: +69 38 13.54 (69.63709d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS
	Comments: Category=GALAXY Description=[STAR FORMING REGION]					

Proposal 16185 - Field 3, Visit 1 (09) - Resolving Star Formation Triggered by M82's Prototypical Superwind

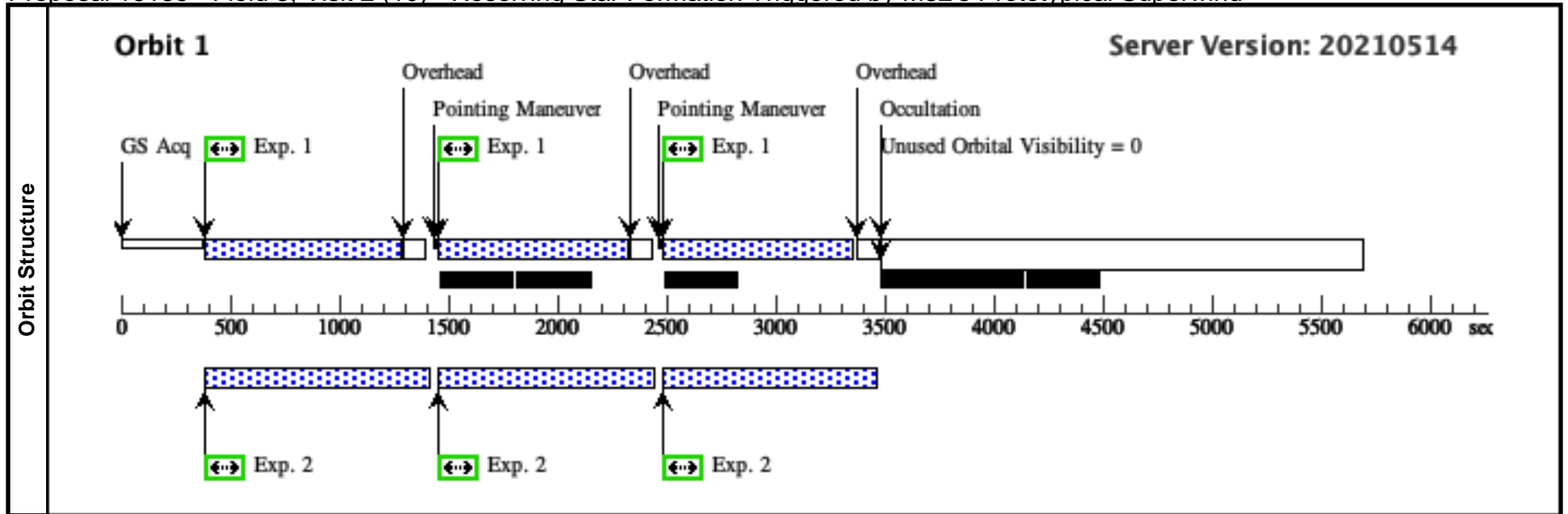
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(3) M82-FIELD3	WFC3/UVIS, ACCUM, UVIS	F814W		POS TARG 0.98,0.98	Sequence 1-4 Non-Int in Field 3, Visit 1 (09)	888 Secs (1738 Secs)	
								Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 3, Visit 1 (09) (2)	[==>869.0 Secs (Pattern 1)] [==>869.0 Secs (Pattern 2)]	[1]
								Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 3, Visit 1 (09)		
2		ANY	ACS/WFC, ACCUM, WFC	F814W			Sequence 1-4 Non-Int in Field 3, Visit 1 (09)	870 Secs (1698 Secs)		
							Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 3, Visit 1 (09) (2)	[==>828.0 Secs (Pattern 1)] [==>870 Secs (Pattern 2)]	[1]	
							Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 3, Visit 1 (09)			
3		(3) M82-FIELD3	WFC3/UVIS, ACCUM, UVIS	F475W			Sequence 1-4 Non-Int in Field 3, Visit 1 (09)	888 Secs (869 Secs)		
							Prime + Parallel Group 3-4 in Sequence 1-4 Non-Int in Field 3, Visit 1 (09)	[==>869.0 Secs]	[1]	
4		ANY	ACS/WFC, ACCUM, WFC	F475W			Sequence 1-4 Non-Int in Field 3, Visit 1 (09)	870 Secs (804 Secs)		
							Prime + Parallel Group 3-4 in Sequence 1-4 Non-Int in Field 3, Visit 1 (09)	[==>804.0 Secs]	[1]	



Proposal 16185 - Field 3, Visit 2 (10) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Tue Aug 17 20:00:32 GMT 2021

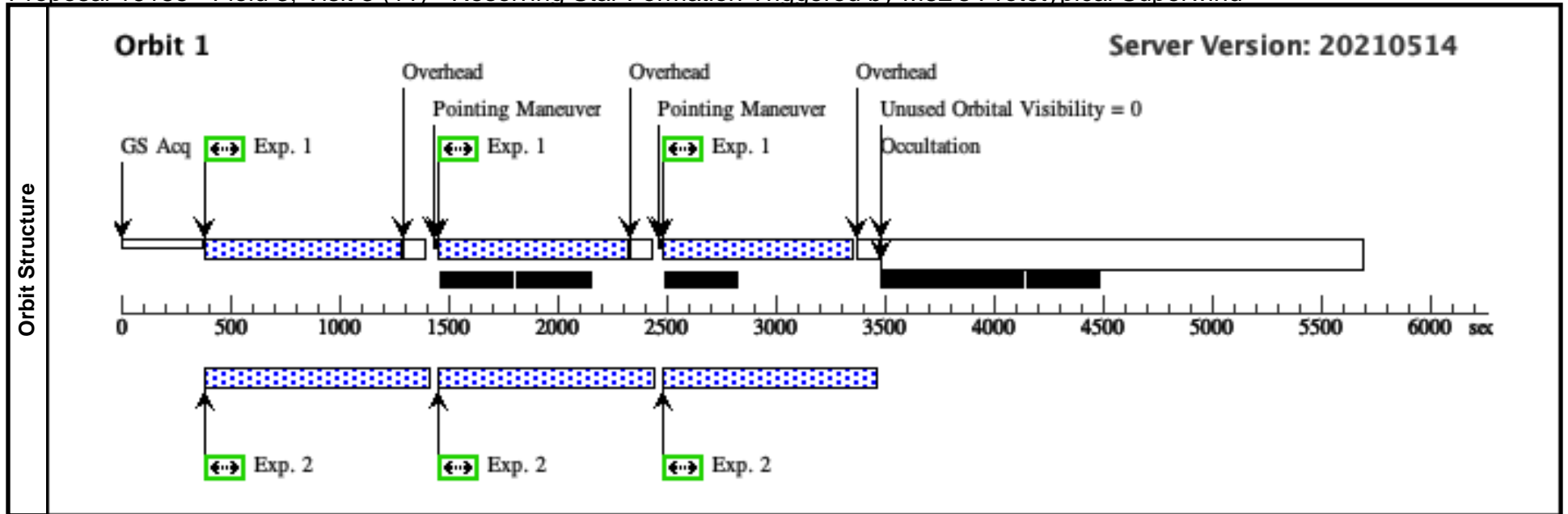
Visit	Proposal 16185, Field 3, Visit 2 (10), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 09; AFTER 09									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=2.98 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				
	(3)	M82-FIELD3	RA: 09 58 46.3483 (149.6931179d) Dec: +69 38 13.54 (69.63709d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(3) M82-FIELD3	WFC3/UVIS, ACCUM, UVIS	F814W				Sequence 1-2 Non-Int in Field 3, Visit 2 (10) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 2 (10) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 2 (10)	888 Secs (2613 Secs) [==>871.0 Secs (Pattern 1)] [==>871.0 Secs (Pattern 2)] [==>871.0 Secs (Pattern 3)]
2		ANY		ACS/WFC, ACCUM, WFC	F814W			Sequence 1-2 Non-Int in Field 3, Visit 2 (10) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 2 (10) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 2 (10)	870 Secs (2559 Secs) [==>828.0 Secs (Pattern 1)] [==>(Pattern 2)] [==>861.0 Secs (Pattern 3)]	[1]



Proposal 16185 - Field 3, Visit 3 (11) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Tue Aug 17 20:00:32 GMT 2021

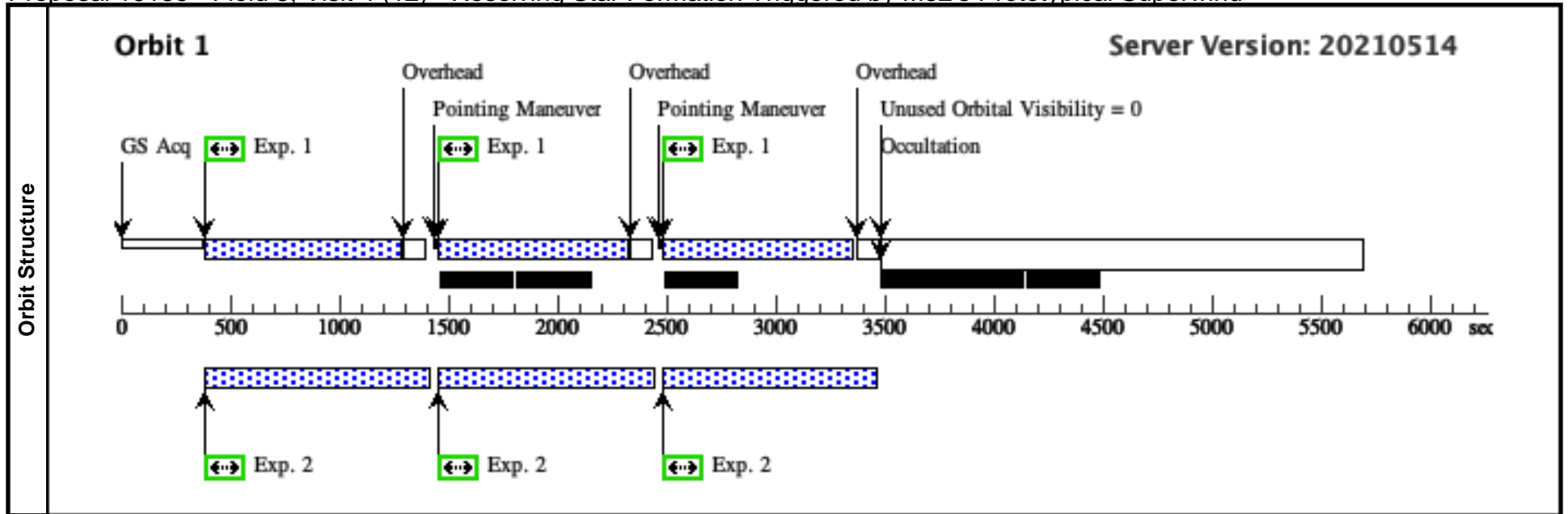
Visit	Proposal 16185, Field 3, Visit 3 (11), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 09; AFTER 10									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=2.98 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				
	(3)	M82-FIELD3	RA: 09 58 46.3483 (149.6931179d) Dec: +69 38 13.54 (69.63709d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(3) M82-FIELD3	WFC3/UVIS, ACCUM, UVIS	F475W			Sequence 1-2 Non-Int in Field 3, Visit 3 (11) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 3 (11) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 3 (11)	888 Secs (2613 Secs) [==>871.0 Secs (Pattern 1)] [==>871.0 Secs (Pattern 2)] [==>871.0 Secs (Pattern 3)]	[1]
	2	ANY		ACS/WFC, ACCUM, WFC	F475W			Sequence 1-2 Non-Int in Field 3, Visit 3 (11) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 3 (11) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 3 (11)	870 Secs (2559 Secs) [==>828.0 Secs (Pattern 1)] [==>(Pattern 2)] [==>861.0 Secs (Pattern 3)]	[1]



Proposal 16185 - Field 3, Visit 4 (12) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Tue Aug 17 20:00:32 GMT 2021

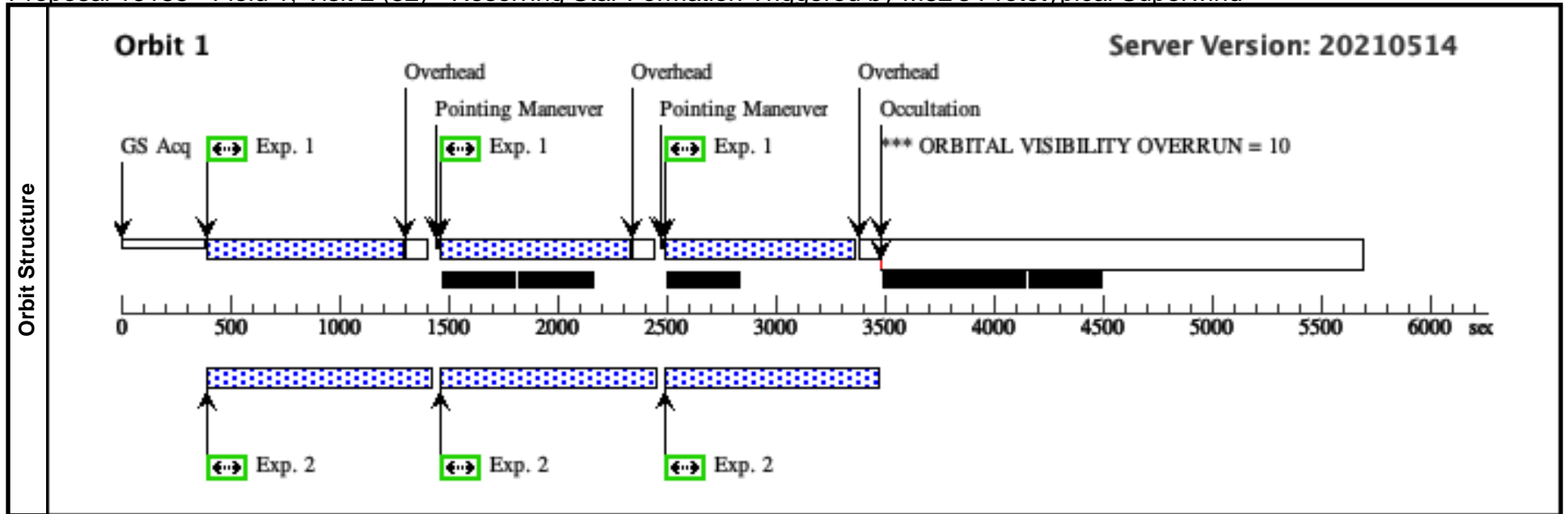
Visit	Proposal 16185, Field 3, Visit 4 (12), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 09; AFTER 11									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=2.98 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				
	(3)	M82-FIELD3	RA: 09 58 46.3483 (149.6931179d) Dec: +69 38 13.54 (69.63709d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(3) M82-FIELD3	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-2 Non-Int in Field 3, Visit 4 (12) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 4 (12) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 4 (12)	888 Secs (2613 Secs) [==>871.0 Secs (Pattern 1)] [==>871.0 Secs (Pattern 2)] [==>871.0 Secs (Pattern 3)]	[1]
	2	ANY		ACS/WFC, ACCUM, WFC	F814W			Sequence 1-2 Non-Int in Field 3, Visit 4 (12) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 4 (12) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 3, Visit 4 (12)	870 Secs (2559 Secs) [==>828.0 Secs (Pattern 1)] [==>(Pattern 2)] [==>861.0 Secs (Pattern 3)]	[1]



Proposal 16185 - Field 1, Visit 2 (52) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Tue Aug 17 20:00:33 GMT 2021

Visit	Proposal 16185, Field 1, Visit 2 (52), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 01; AFTER 01									
	(Field 1, Visit 2 (52)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN									
Diagnosics										
Patterns	#	Primary Pattern	Secondary Pattern		Exposures					
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=2.98 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)	M82-FIELD1	RA: 09 56 21.0298 (149.0876242d) Dec: +69 36 50.90 (69.61414d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS				
<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) M82-FIELD1	WFC3/UVIS, ACCUM, UVIS	F814W		GS ACQ SCENARI O BASE1BE	Sequence 1-2 Non-Int in Field 1, Visit 2 (52) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 2 (52) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 2 (52)	888 Secs (2613 Secs) [==>871.0 Secs (Pattern 1)] [==>871.0 Secs (Pattern 2)] [==>871.0 Secs (Pattern 3)]	[1]
	2	ANY		ACS/WFC, ACCUM, WFC	F814W			Sequence 1-2 Non-Int in Field 1, Visit 2 (52) Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 2 (52) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Sequence 1-2 Non-Int in Field 1, Visit 2 (52)	870 Secs (2559 Secs) [==>828.0 Secs (Pattern 1)] [==>(Pattern 2)] [==>861.0 Secs (Pattern 3)]	[1]



Proposal 16185 - Field 3, Visit 1 (59) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Visit	Proposal 16185, Field 3, Visit 1 (59), implementation Tue Aug 17 20:00:33 GMT 2021					
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 182D TO 185 D					
Patterns	#	Primary Pattern	Secondary Pattern	Exposures		
	(2)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=2.98 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
	(3)	M82-FIELD3	RA: 09 58 46.3483 (149.6931179d) Dec: +69 38 13.54 (69.63709d) Equinox: J2000		V=15+/-2	Reference Frame: ICRS
<i>Comments:</i> Category=GALAXY Description=[STAR FORMING REGION]						

Proposal 16185 - Field 3, Visit 1 (59) - Resolving Star Formation Triggered by M82's Prototypical Superwind

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(3) M82-FIELD3	WFC3/UVIS, ACCUM, UVIS	F814W		POS TARG 0.98,0.98; GS ACQ SCENARIO BASE1BE	Sequence 1-4 Non-Int in Field 3, Visit 1 (59) Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 3, Visit 1 (59) (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 3, Visit 1 (59)	888 Secs (1738 Secs) [==>869.0 Secs (Pattern 1)] [==>869.0 Secs (Pattern 2)]	[1]
	2		ANY	ACS/WFC, ACCUM, WFC	F814W			Sequence 1-4 Non-Int in Field 3, Visit 1 (59) Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 3, Visit 1 (59) (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Sequence 1-4 Non-Int in Field 3, Visit 1 (59)	870 Secs (1698 Secs) [==>828.0 Secs (Pattern 1)] [==>870 Secs (Pattern 2)]	[1]
	3		(3) M82-FIELD3	WFC3/UVIS, ACCUM, UVIS	F475W			Sequence 1-4 Non-Int in Field 3, Visit 1 (59) Prime + Parallel Group 3-4 in Sequence 1-4 Non-Int in Field 3, Visit 1 (59)	888 Secs (869 Secs) [==>869.0 Secs]	[1]
	4		ANY	ACS/WFC, ACCUM, WFC	F475W			Sequence 1-4 Non-Int in Field 3, Visit 1 (59) Prime + Parallel Group 3-4 in Sequence 1-4 Non-Int in Field 3, Visit 1 (59)	870 Secs (804 Secs) [==>804.0 Secs]	[1]

