16076 - UV spectroscopy and imaging of the transient Swift J221951-484240 discovered in the follow-up of GW S190930t.

Cycle: 27, Proposal Category: GO

(UV Initiative)

(Availability Mode: AVAILABLE)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Samantha Oates (PI) (ESA Member) (Contact)	**University of Birmingham**	**sroates@star.sr.bham.ac.uk**
Dr. N.P.M Paul Kuin (CoI) (ESA Member) (Contact)	Mullard Space Science Laboratory	n.kuin@ucl.ac.uk
Dr. Stephen Bradley Cenko (CoI) (AdminUSPI)	NASA Goddard Space Flight Center	brad.cenko@nasa.gov
Dr. Matt Nicholl (CoI) (ESA Member)	University of Birmingham	mnicholl@star.sr.bham.ac.uk
Dr. David Buckley (CoI)	South African Astronomical Observatory	dibnob@saao.ac.za

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
03	(1) SWIFTJ221951-484240	COS/FUV	3	16-Apr-2020 19:00:21.0	yes
05	(2) SWIFTJ221951-484240-SAFE-TARGET	COS/FUV	3	16-Apr-2020 19:00:23.0	yes
02	(1) SWIFTJ221951-484240	ACS/WFC	1	16-Apr-2020 19:00:24.0	yes
04	(1) SWIFTJ221951-484240	S/C	1	16-Apr-2020 19:00:24.0	yes

8 Total Orbits Used

ABSTRACT

Swift/UVOT detected J221951-484240 on the 30th September 2019 as part of the search for an electromagnetic counterpart to the LIGO/VIRGO Gravitational Wave (GW) trigger S190930t; after the cycle 27 proposal deadline. Compared to archival UV images, J221951-484240 is brighter by over 3 magntidues. The nature of this blue-slowly evolving source remains unclear following Swift and ground-based follow-up. It is possible this transient is associated with S190930t or alternatively it may be a new class of UV-bright transient. HST UV data is the only means to constrain the distance to the source and its true nature. Determining this now will allow us to plan additional observations using Swift, HST and other resources to follow its evolution. Observations in the present cycle would also facilitate rapid publication, which is of particular importance as this source was identified during follow-up of a GW alert. Only HST has the UV spectroscopic capability to obtain the key data needed to identify the nature of this 19th magnitude u-band transient before it fades away. Owing to the unique nature of this source, these observations will lead to a timely and high-impact publication whether or not it is connected to the GW emission.

OBSERVING DESCRIPTION

UV spectroscopy and imaging of the transient Swift J221951-484240 with COS and ACS

Visit

Proposal 16076, COS_spectrum (03), implementation Thu Apr 16 23:00:24 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: ORIENT 105D TO 350 D; AFTER 04 BY 3 D TO 10 D; BEFORE 30-JUN-2020:00:00:00

Comments: This visit should be scheduled in the evening local time. Flags need to be cleared during the workday.

Diagnostics

(COS_spectrum (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

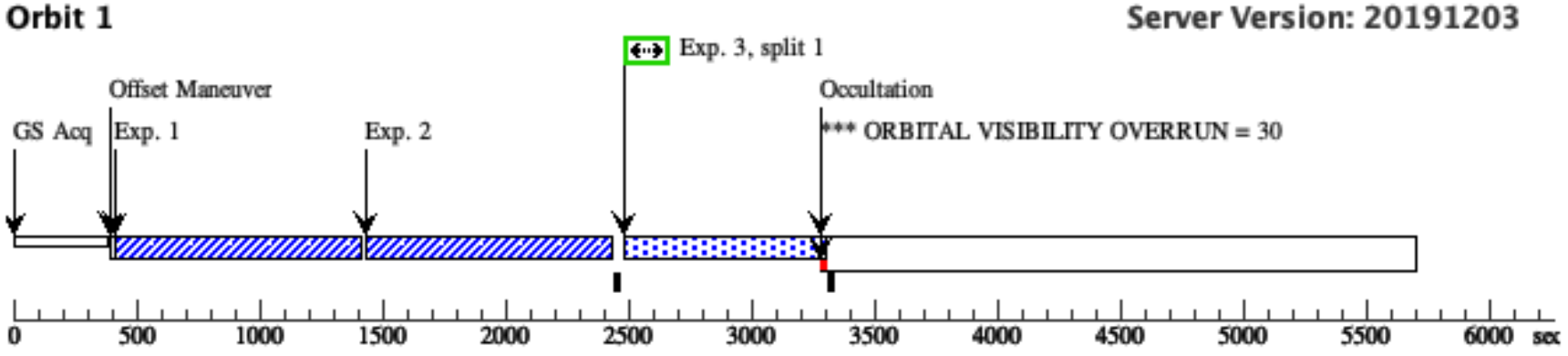
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SWIFTJ221951-484240	RA: 22 19 51.8110 (334.9658792d) Dec: -48 42 40.72 (-48.71131d) Equinox: J2000		V=19.6+/-0.5	Reference Frame: ICRS

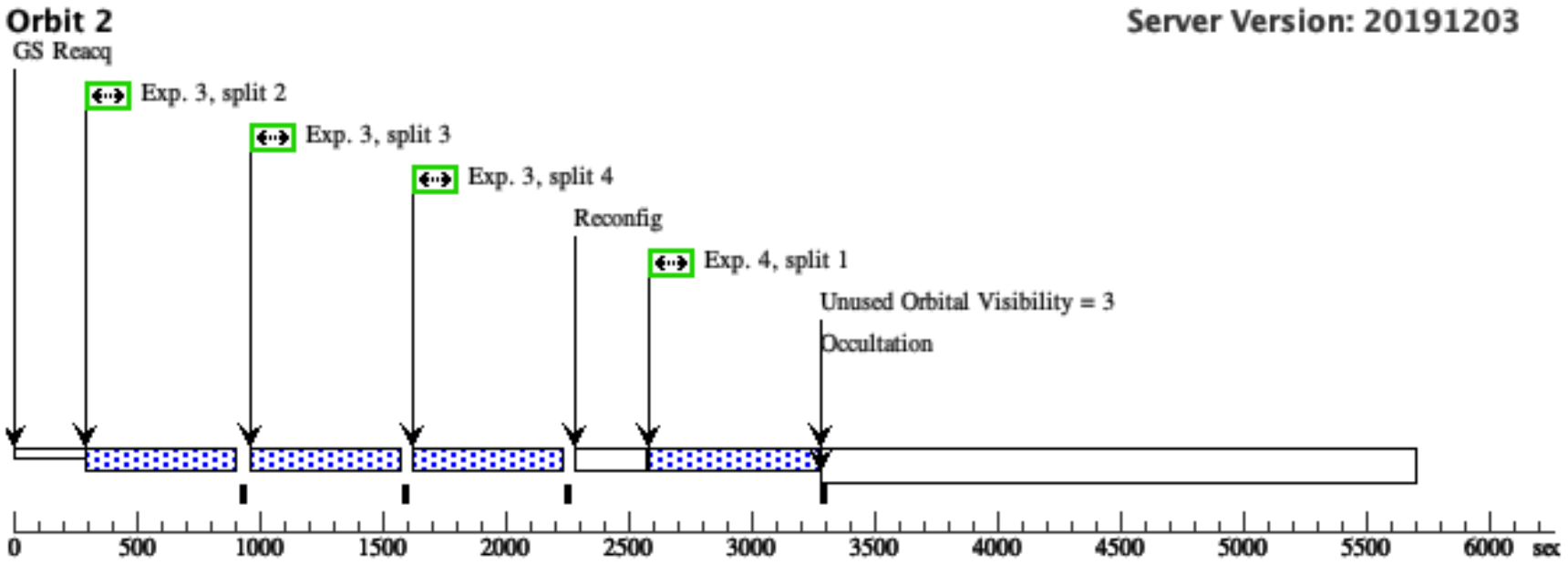
Comments:
Category=UNIDENTIFIED
Description=[INFRARED EMITTER, OPTICAL EMITTER, ULTRAVIOLET EMITTER, UNDESIGNATED]
Extended=NO

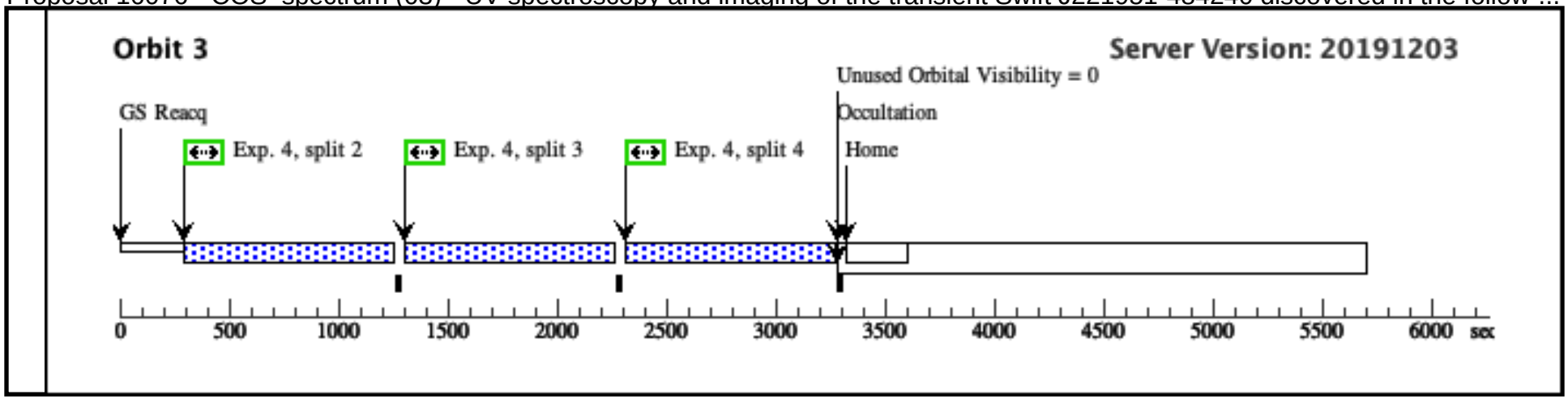
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ_PEAKXD (COS.sa.1436550)	(1) SWIFTJ221951-484240	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	NUM-POS=3; STEP-SIZE=1.3; CENTER=DEF; SEGMENT=BOTH; LIFETIME-POS=LP4	USE OFFSET V03SAF		300 Secs (300 Secs) *[==>]*	 ***[1]***
2	ACQ_PEAKD (COS.sa.1436550)	(1) SWIFTJ221951-484240	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=1.3; NUM-POS=3.; CENTER=DEF; SEGMENT=BOTH; LIFETIME-POS=LP4	USE OFFSET V03SAF		300 Secs (300 Secs) *[==>]*	 ***[1]***
3	Exp6_C1280 (COS.sp.1436187)	(1) SWIFTJ221951-484240	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=16862; FP-POS=ALL; SEGMENT=BOTH	USE OFFSET V03SAF		500 Secs (2275 Secs) *[==>607.0 Secs (Split 1)]* *[==>556.0 Secs (Split 2)]* *[==>556.0 Secs (Split 3)]* *[==>556.0 Secs (Split 4)]*	 ***[1]*** ***[2]***
4	Exp4_C1105 (COS.sp.1436186)	(1) SWIFTJ221951-484240	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=8544; FP-POS=ALL; SEGMENT=A	USE OFFSET V03SAF		500 Secs (3265 Secs) *[==>556.0 Secs (Split 1)]* *[==>903.0 Secs (Split 2)]* *[==>903.0 Secs (Split 3)]* *[==>903.0 Secs (Split 4)]*	 ***[2]*** ***[3]***

Orbit Structure






Orbit 3
Server Version: 20191203
Unused Orbital Visibility = 0
GS Reacq
Occultation
Exp. 4, split 2
Exp. 4, split 3
Exp. 4, split 4
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16076, SCIENCETARGET-BOP-ONLY (05) Thu Apr 16 23:00:25 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV

Special Requirements: ORIENT 105D TO 350 D; BEFORE 30-JUN-2020:00:00:00

Comments: This visit is for BOP checking the safe target only and should not execute onboard HST.

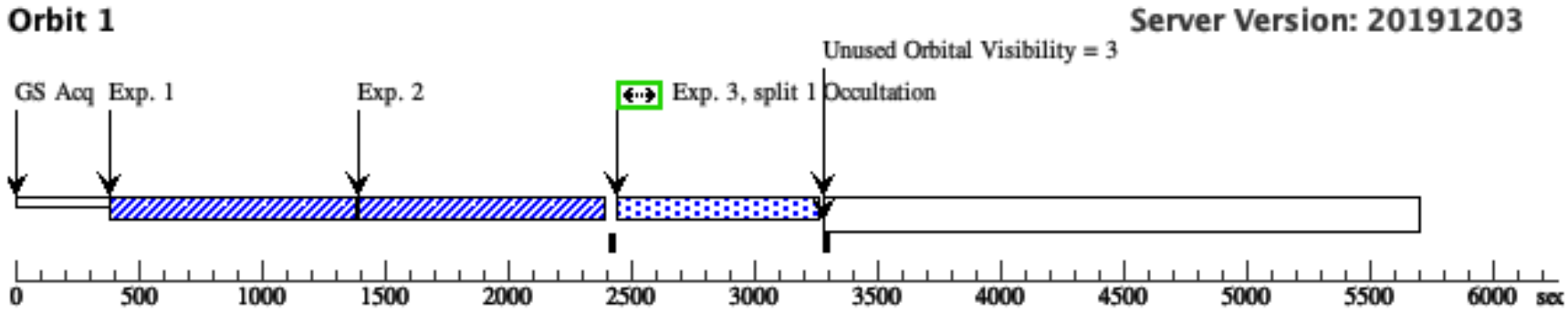
Fixed Targets

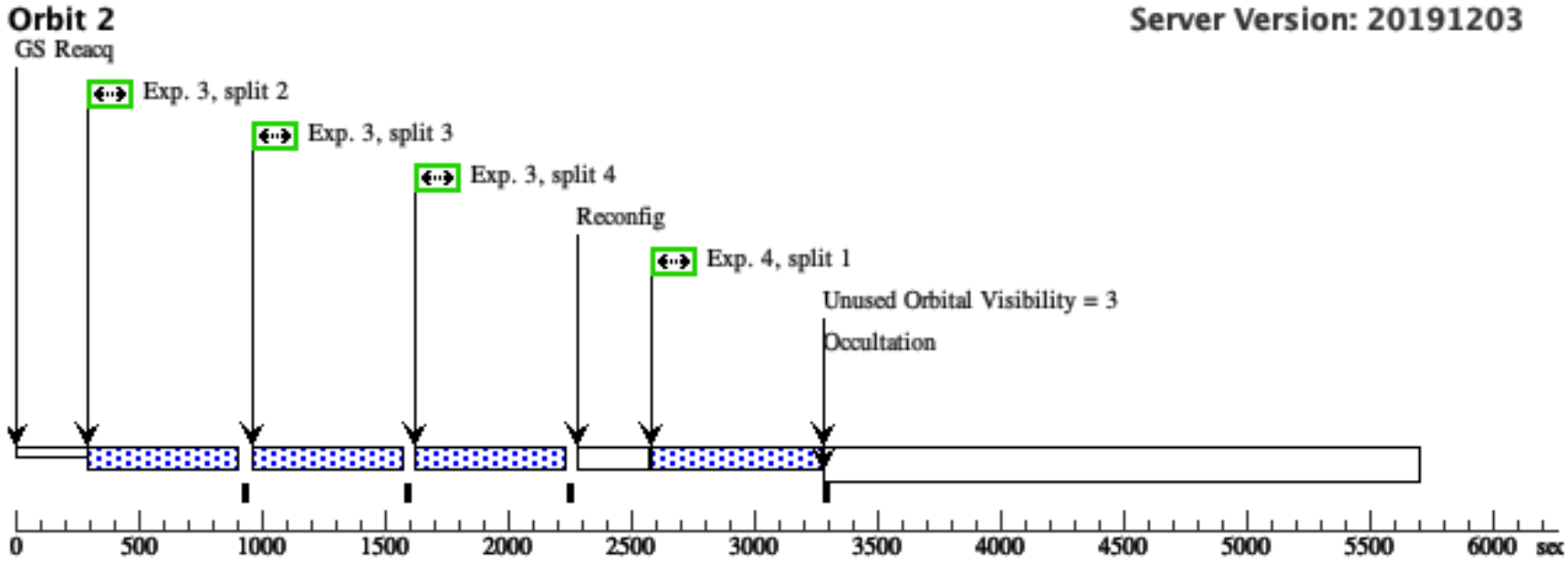
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SWIFTJ221951-484240	RA: 22 19 51.8110 (334.9658792d) Dec: -48 42 40.72 (-48.71131d) Equinox: J2000		V=19.6+/-0.5	Reference Frame: ICRS
Comments: *Category=UNIDENTIFIED* *Description=[INFRARED EMITTER, OPTICAL EMITTER, ULTRAVIOLET EMITTER, UNDESIGNATED]* *Extended=NO*					
(2)	SWIFTJ221951-484240-SAFE-TARGET	Offset from SWIFTJ221951-484240 RA Offset: -0.99 Secs Dec Offset: -0.233 Arcsec		V=19.6+/-0.5	Offset Position (SWIFTJ221951-484240-SAFE-TARGET)
Comments: This target is a blank piece of sky which is the bright object safe pointing and is 9.839 arcseconds away at a PA of 271.4 degrees U3. *Category=UNIDENTIFIED* *Description=[BLANK FIELD]* *Extended=NO*					

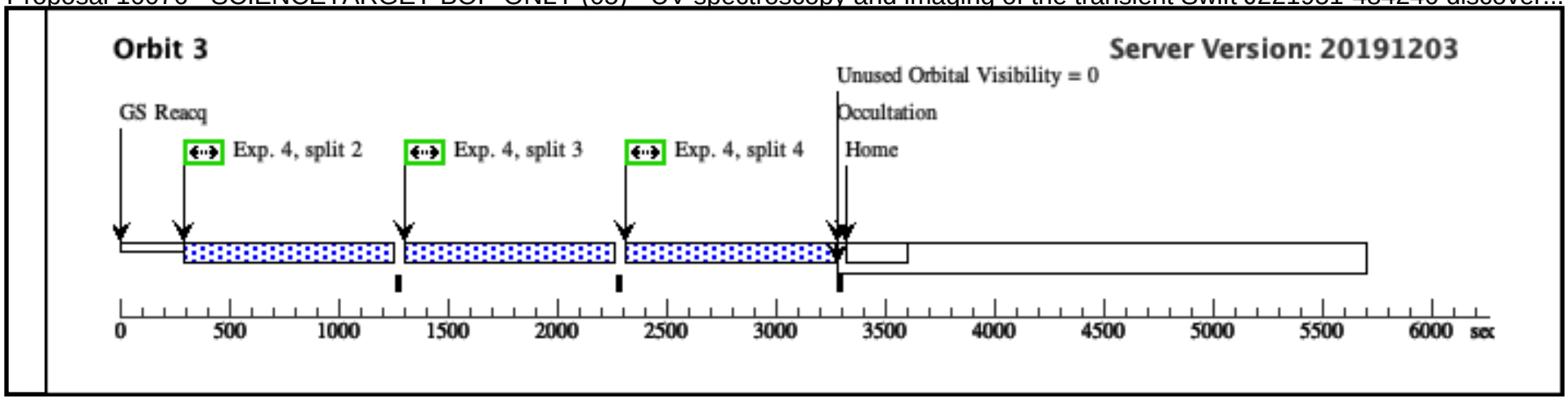
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ_PEAKXD (COS.sa.1436550)	(2) SWIFTJ221951-484240-SAFE-TARGET	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	NUM-POS=3; STEP-SIZE=1.3; CENTER=DEF; SEGMENT=BOTH; LIFETIME-POS=LP4			300 Secs (300 Secs) *[==>]*	***[1]***
2	ACQ_PEAKD (COS.sa.1436550)	(2) SWIFTJ221951-484240-SAFE-TARGET	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=1.3; NUM-POS=3.; CENTER=DEF; SEGMENT=BOTH; LIFETIME-POS=LP4			300 Secs (300 Secs) *[==>]*	***[1]***
3	Exp6_C1280 (COS.sp.1436187)	(2) SWIFTJ221951-484240-SAFE-TARGET	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=16862; FP-POS=ALL; SEGMENT=BOTH			500 Secs (2275 Secs) *[==>607.0 Secs (Split 1)]* *[==>556.0 Secs (Split 2)]* *[==>556.0 Secs (Split 3)]* *[==>556.0 Secs (Split 4)]*	***[1]*** ***[2]***
4	Exp4_C1105 (COS.sp.1436186)	(2) SWIFTJ221951-484240-SAFE-TARGET	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=8544; FP-POS=ALL; SEGMENT=A			500 Secs (3265 Secs) *[==>556.0 Secs (Split 1)]* *[==>903.0 Secs (Split 2)]* *[==>903.0 Secs (Split 3)]* *[==>903.0 Secs (Split 4)]*	***[2]*** ***[3]***

Orbit Structure






Orbit 3
Server Version: 20191203
Unused Orbital Visibility = 0
GS Reacq
Occultation
Exp. 4, split 2
Exp. 4, split 3
Exp. 4, split 4
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16076, ACS-WFC_image (02), implementation Thu Apr 16 23:00:25 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.262 Line Spacing=0.192	Coordinate Frame=POS-TARG Pattern Orientation=18.39 Angle Between Sides=68.14 Center Pattern=false		(1)

Fixed Targets

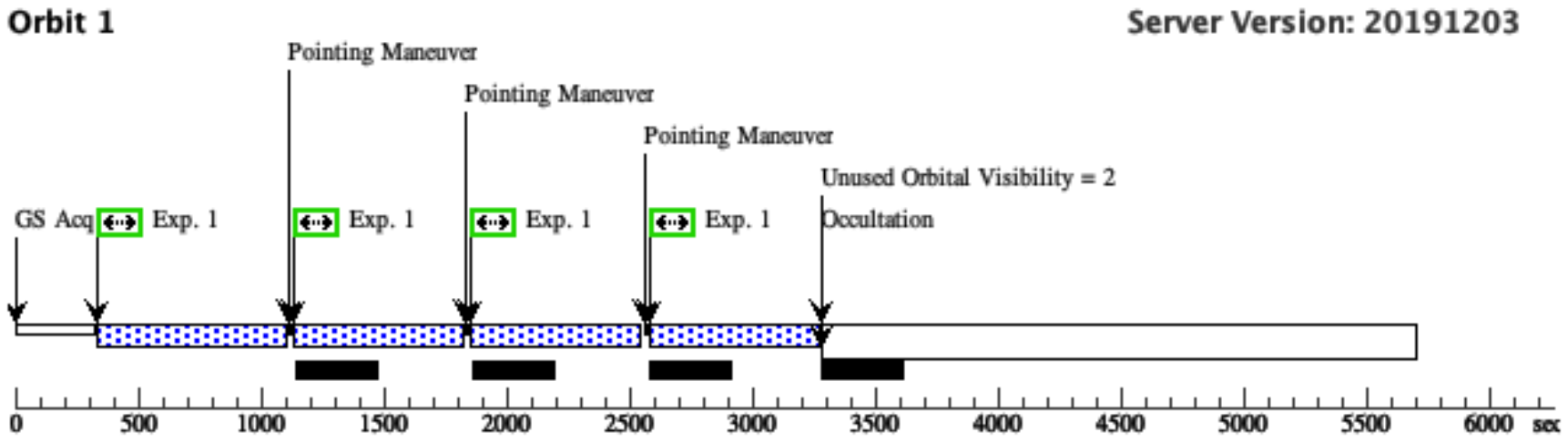
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SWIFTJ221951-484240	RA: 22 19 51.8110 (334.9658792d) Dec: -48 42 40.72 (-48.71131d) Equinox: J2000		V=19.6+/-0.5	Reference Frame: ICRS

Comments:
Category=UNIDENTIFIED
Description=[INFRARED EMITTER, OPTICAL EMITTER, ULTRAVIOLET EMITTER, UNDESIGNATED]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(ACS.im.14 36899)	(1) SWIFTJ221951-484240	ACS/WFC, ACCUM, WFC1-CTE	F475W	GAIN=2.0		Pattern 1, Exps 1-1 in ACS-WFC_image (02) (1)	579 Secs (2256 Secs) *[==>564.0 Secs (Pattern 1)]* *[==>564.0 Secs (Pattern 2)]* *[==>564.0 Secs (Pattern 3)]* *[==>564.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 16076, S/C VISIT (04) Thu Apr 16 23:00:25 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: S/C

Special Requirements: ORIENT 105D TO 350 D

Comments: This visit allocates and sets up the safe position offset slot for visit 03 which will use that slot. This S/C visit should go earlier in the week while visit 03 will be at least 3 days later.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SWIFTJ221951-484240	RA: 22 19 51.8110 (334.9658792d) Dec: -48 42 40.72 (-48.71131d) Equinox: J2000		V=19.6+/-0.5	Reference Frame: ICRS

Comments:
Category=UNIDENTIFIED
Description=[INFRARED EMITTER, OPTICAL EMITTER, ULTRAVIOLET EMITTER, UNDESIGNATED]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SWIFTJ221951-484240	S/C, DATA, V1			POS TARG 229.13280000,-241.05750000; SAVE OFFSET V03 SAF; SPEC COM INSTR ECSLOTSET; QESIPARM ANGLE 271.4; QESIPARM DIST 9.839		5 Secs (5 Secs) *[==>]*	***[1]***

Orbit Structure