15161 - The fate of infalling gas during its final approach onto the Milky Way disk

Cycle: 25, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Kat A Barger (PI) (Contact)	**Texas Christian University**	**k.barger@tcu.edu**
Dr. Andrew J. Fox (CoI) (ESA Member)	Space Telescope Science Institute - ESA	afox@stsci.edu
Dr. Felix J. Lockman (CoI)	Associated Universities, Inc.	jlockman@nrao.edu
Dr. Lauren Corlies (CoI)	LSST	lcorlies@lsst.org
Dr. Molly Peeples (CoI)	Space Telescope Science Institute	molly@stsci.edu
Dr. Alex S Hill (CoI) (CSA Member)	University of British Columbia	ashill@astro.ubc.ca

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) GALEX-J204402.0-075809	COS/FUV COS/NUV	3	12-Dec-2018 14:01:01.0	yes
02	(2) GALEX-J203335.8-032038	COS/FUV COS/NUV	4	12-Dec-2018 14:01:02.0	yes

7 Total Orbits Used

ABSTRACT

The Smith high-velocity cloud is an advanced stage of falling onto the Milky Way's disk. Its compressed head, comatary morphology structure, and diffuse tail---as well as the adjacent cloud fragments along its length---all indicate that this cloud is interacting strongly with its environment. The Smith Cloud has been studied extensively, making it an ideal candidate to assess the mechanisms that disrupt gas as it is deposited onto an Lstar galaxy and to assess how efficiently this S/H = 0.5 solar metallicity cloud disperses metals into the surrounding coronal gas. We will explore the

properties of a cloud that recently splintered off the main body of the Smith Cloud using new HST/COS/G130M observations toward 2 QSOs. We will compare this freshly stripped cloud fragment with the gas in the wake of the Smith Cloud, which is in an advanced state of mixing, using published HST/COS/G130M observations toward 3 QSOs. We will combine these observations with already acquired spectroscopically resolved HI 21-cm (0.03 kpc resolution) and H-alpha (0.2 kpc resolution) emission maps to investigate how efficiently the surrounding coronal gas and ionizing radiation field are disturbing this cloud. Using spatial maps of the ionization conditions, chemical composition, and gas motions of a high-velocity cloud, we will further develop a model which uses hydrodynamical simulations with metal mixing and gas condensation to describe the evaporation timescale of galactic fountains as they flow onto Lstar galaxies.

OBSERVING DESCRIPTION

This is a 7-orbit proposal to observe two background QSO targets in the direction of the Smith Cloud.

V01 observes a QSO (GALAX-J204402.0-075809, z=0.1034) using the COS G130M grating with central wavelength set to 1291 AA for 3 orbits. It uses an ACQ/IMAGE with MIRRORB. We will also use the 2 FP-POS positions to dither the placing of the spectrum on the grating.

V02 observes a QSO (GALAX-J20333589-0320385, z=0.6964) using the COS G130M grating with central wavelength set to 1291 AA for the 4 orbits. It uses an ACQ/IMAGE with MIRRORB. We will also use the 2 FP-POS positions to dither the placing of the spectrum on the grating.

Visit

Proposal 15161, J20440203-0758105 (01), implementation Wed Dec 12 19:01:03 GMT 2018

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(J20440203-0758105 (01)) Warning (Form): For the best data quality, it is strongly recommended that the maximum number of allowed FP-POS positions is used when observing at a given COS CENWAVE setting. See full description for details.

(J20440203-0758105 (01)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

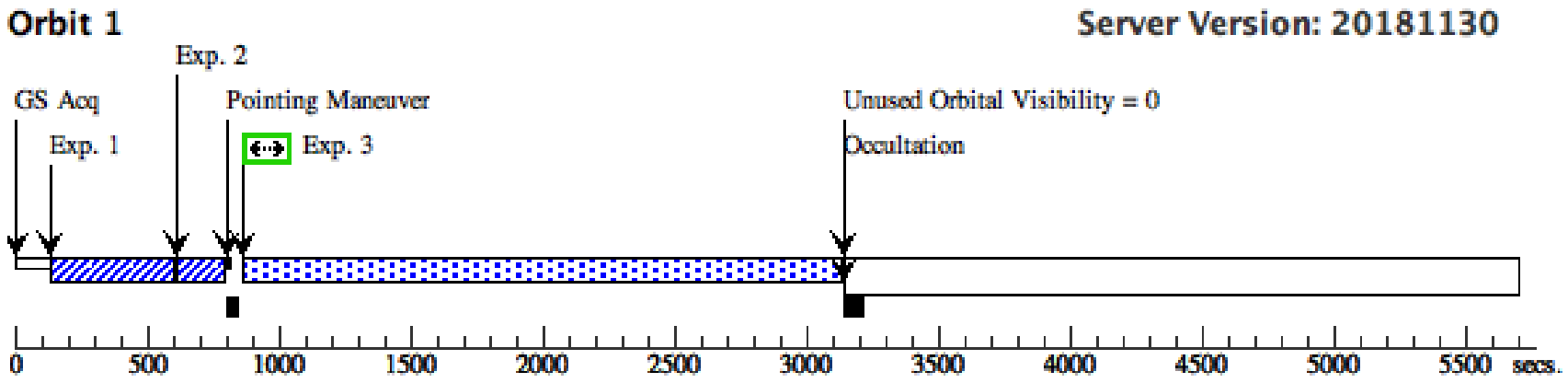
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	GALEX-J204402.0-075809	RA: 20 44 2.0274 (311.0084475d) Dec: -07 58 9.44 (-7.96929d) Equinox: J2000	Redshift: 0.1034	V=17.31 GALEX FUV MAG = 17.78, Magnitude give in B (V MAG u navailible)	Reference Frame: ICRS

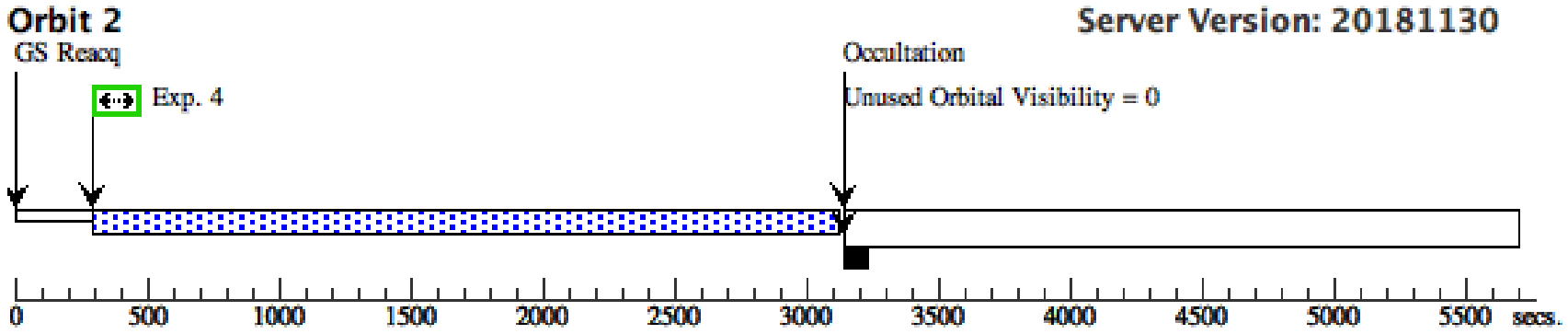
Comments: This object was generated by the targetselector and retrieved from the GALEX database.
Category=ISM
Description=[ABSORPTION LINE SYSTEM - GALACTIC, HIGH VELOCITY CLOUD]
Extended=NO

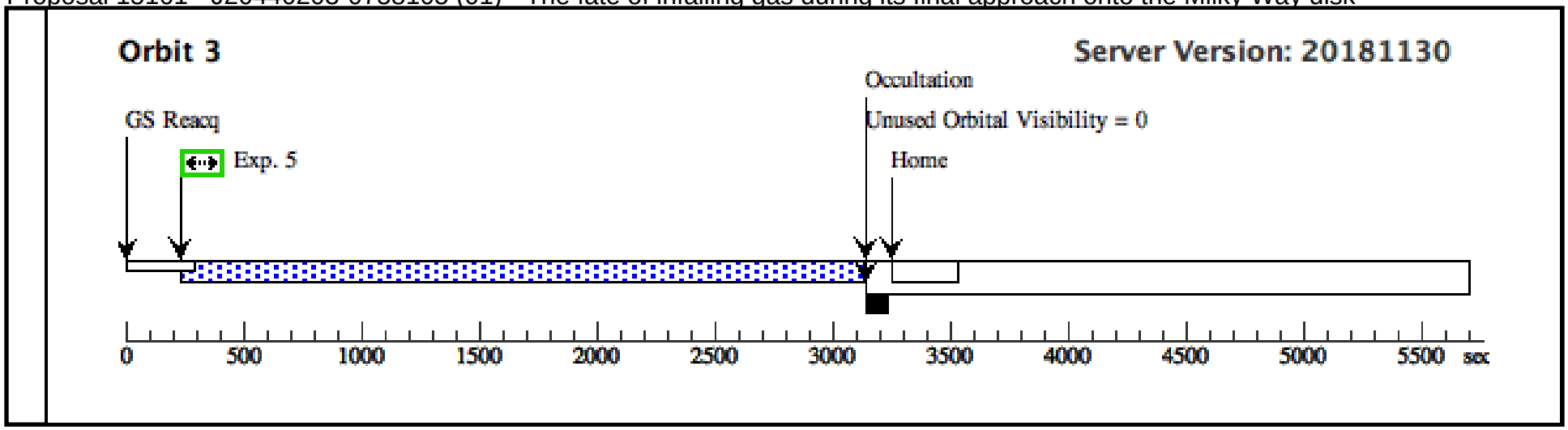
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/SEARCH (1006462)	(1) GALEX-J204402.0-075809	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=2; STEP-SIZE=1.767; CENTER=FLUX-WT			30 Secs (30 Secs) *[==>]*	 ***[1]***
2	ACQ/IMAGE (1006462)	(1) GALEX-J204402.0-075809	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				44 Secs (44 Secs) *[==>]*	 ***[1]***
3	J20440203-0758105-FPP0S3 (1006273)	(1) GALEX-J204402.0-075809	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=3473; FP-POS=3			2097 Secs (2097 Secs) *[==>]*	 ***[1]***
4	J20440203-0758105-FPP0S4 (1006273)	(1) GALEX-J204402.0-075809	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=3473			2779 Secs (2779 Secs) *[==>]*	 ***[2]***
5	J20440203-0758105-FPP0S3 (1006273)	(1) GALEX-J204402.0-075809	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=3473			2779 Secs (2779 Secs) *[==>]*	 ***[3]***

Orbit Structure



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3500
4000
4500
5000
5500
sec

Visit

Proposal 15161, J20333589-0320285 (02), implementation Wed Dec 12 19:01:03 GMT 2018

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(J20333589-0320285 (02)) Warning (Form): For the best data quality, it is strongly recommended that the maximum number of allowed FP-POS positions is used when observing at a given COS CENWAVE setting. See full description for details.

(J20333589-0320285 (02)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS

Fixed Targets

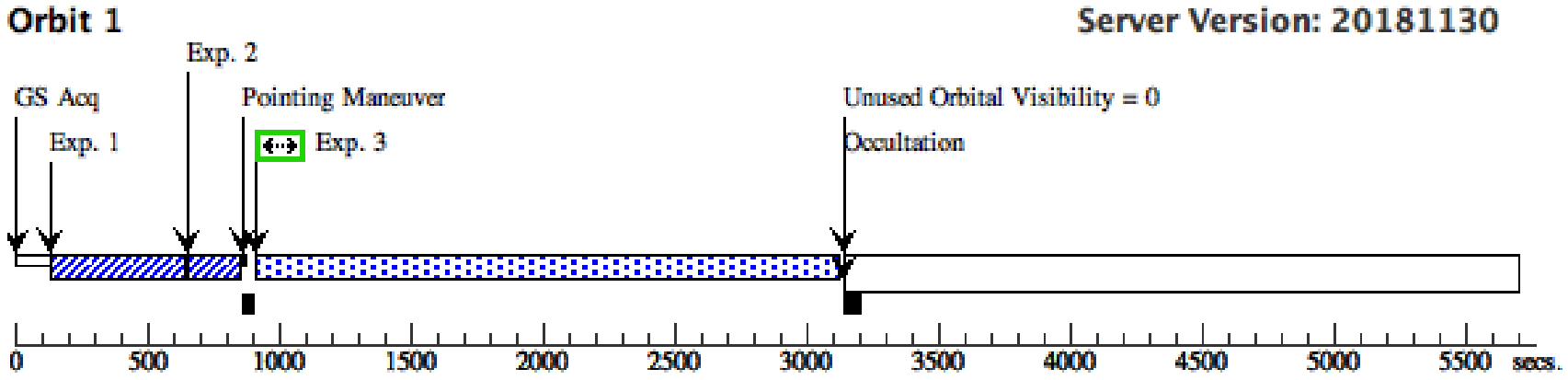
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	GALEX-J203335.8-032038	RA: 20 33 35.8773 (308.3994887d) Dec: -03 20 38.65 (-3.34407d) Equinox: J2000	Redshift: 0.6964	V=17.73952 GALEX FUV MAG = 17.74 NU V MAG=17.07	Reference Frame: ICRS

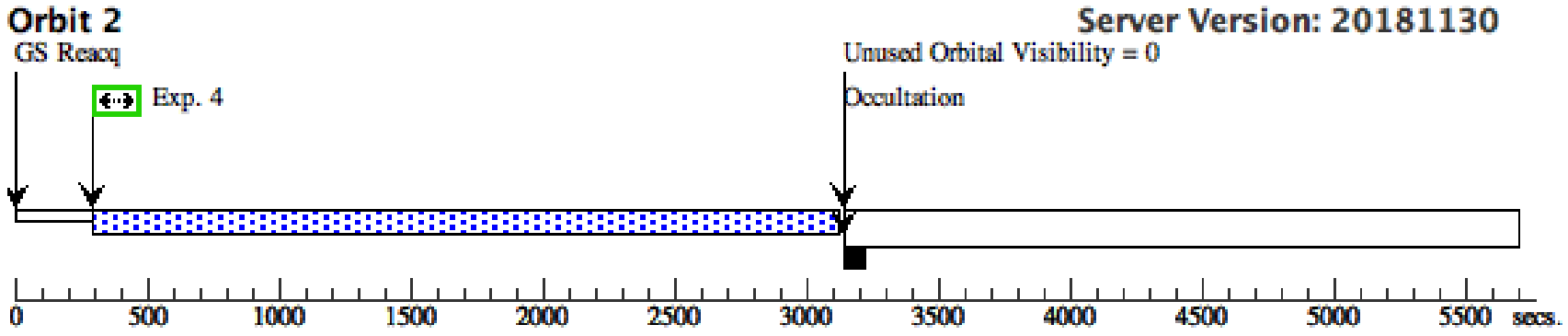
Comments: This object was generated by the targetselector and retrieved from the GALEX database.
Category=ISM
Description=[ABSORPTION LINE SYSTEM - GALACTIC, HIGH VELOCITY CLOUD]
Extended=NO

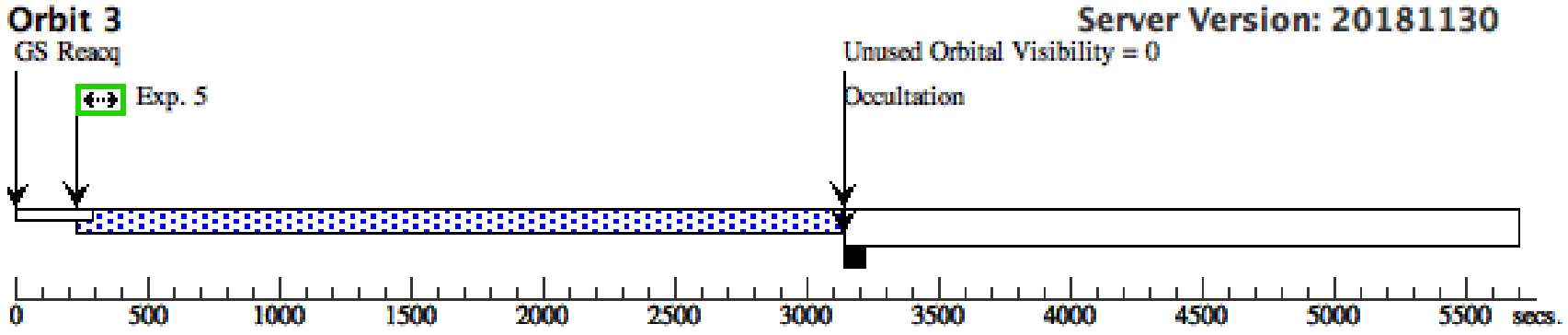
Exposures

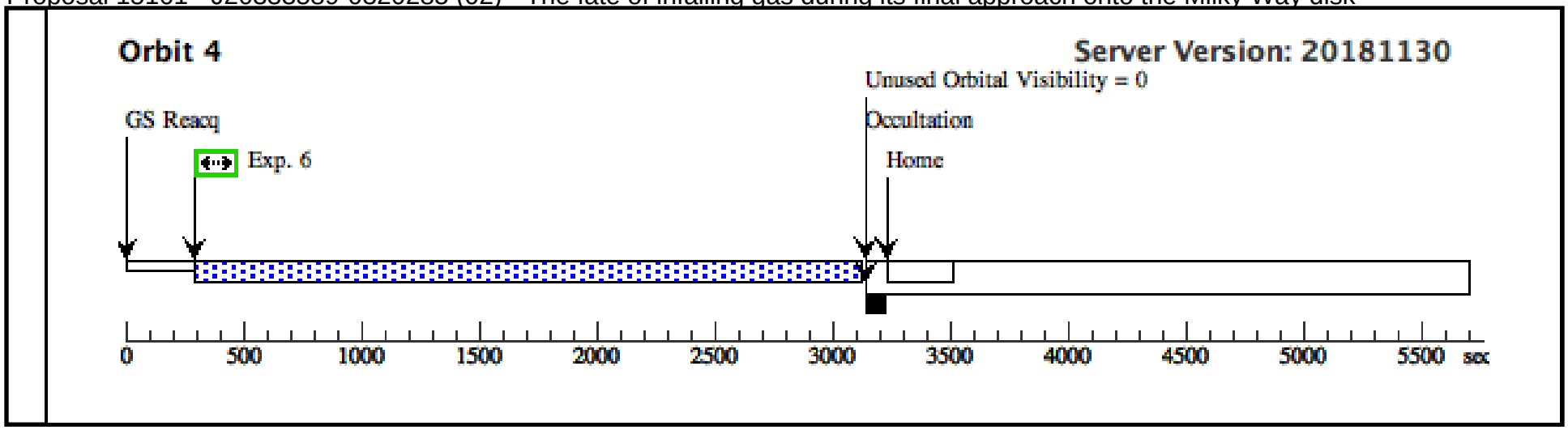
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/SEARCH (1006465)	(2) GALEX-J203335.8-032038	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=2; STEP-SIZE=1.767; CENTER=FLUX-WT			40 Secs (40 Secs) *[==>]*	*[1]*
2	ACQ/IMAGE (1006465)	(2) GALEX-J203335.8-032038	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				51 Secs (51 Secs) *[==>]*	*[1]*
3	J20333589-0320285-FP P0S3 (1006274)	(2) GALEX-J203335.8-032038	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=4048			2040 Secs (2040 Secs) *[==>]*	*[1]*
4	J20333589-0320285-FP P0S4 (1006274)	(2) GALEX-J203335.8-032038	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=4048			2776 Secs (2776 Secs) *[==>]*	*[2]*
5	J20333589-0320285-FP P0S3 (1006274)	(2) GALEX-J203335.8-032038	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=4048			2776 Secs (2776 Secs) *[==>]*	*[3]*
6	J20333589-0320285-FP P0S4 (1006274)	(2) GALEX-J203335.8-032038	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=4048			2776 Secs (2776 Secs) *[==>]*	*[4]*

Orbit Structure





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