15617 - J1047+0739: X-ray weak/obscured AGN or extreme starburst?

Cycle: 26, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
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Dr. Daniel K Stern (CoI)	Jet Propulsion Laboratory	daniel.k.stern@jpl.nasa.gov

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) J1047+0739	ACS/WFC	4	14-Dec-2018 11:02:37.0	yes
02	(1) J1047+0739	ACS/WFC	4	14-Dec-2018 11:02:39.0	yes

8 Total Orbits Used

ABSTRACT

We propose a 50ks Chandra exposure of the enigmatic dwarf galaxy, SDSS J1047+0739, which has exceptionally luminous broad H-alpha, yet lies a factor of ~100 below the mean X-ray to H-alpha and [OIII] relations for AGN in a previous Chandra snapshot. The new data will characterize the X-ray spectral and temporal nature far better, addressing how such an extreme object might still be explained under the AGN paradigm. We additionally request HST ACS imaging to characterize the H-alpha morphology and distribution (point-like, clumpy, extended) on >0.1" scales. Coupled with the X-ray constraints, this will help to discern the production mechanism of the constant broad component in J1047+0739 and ultimately address how trustworthy optical broad lines are as tracers of AGN activity.

OBSERVING DESCRIPTION

Observational aim is to constrain spatial extent of the broad H-alpha line through prudent placement of the variable central wavelength of the ACS/WFC FR782N ramp-filter.

Relevant numbers for J1047+0739 are z=0.16828, i=18.4 ABmag, FWHM~0.5", full extent~2", F_Ha,narrow=2.0e14 (13Ang), F_Ha,broad=2.9e14 (42Ang), F_[NII],6583=6.9e16 erg/s/cm2 (13Ang).

We will obtain images sampling the full narrow+broad H-alpha line, the blue and red broad wings, and the continuum with the following:

Setup (1): Lambda_center=7669Ang will image 100% of F_Ha,na and 91% of F_Ha,br in the H-alpha complex

Setup (2): Lambda_center=7755Ang will image 17% of F_Ha,na and red 40% of F_Ha,br in the H-alpha complex

Setup (3): Lambda_center=7583Ang will image 17% of F_Ha,na and blue 40% of F_Ha,br in the H-alpha complex

Setup (4): Lambda_center=7474Ang will provide a continuum-only image to generate line-only images from the other setups.

We expect only marginal contamination from [NII] and [SII]. Subtraction of the scaled continuum will give line only images. Subtraction of scaled line-only images will give reasonable red and blue broad-line and narrow-line images. We use a small 4-pt box dither to better sample the PSF for each setup.

Using the ACS Imaging Exposure Time Calculator (ETC) with standard values, for setups 2 and 3 we aim to detect 25% of the total F_Ha,br, distributed evenly over ~2.0" diameter circular region (i.e., the whole extent), at S/N=20. We conservatively estimate we need ~5000 s split over 4 dithers plus ~350s (~2 orbits) for each setup. Unfortunately, the ETC was not operable presently to attach ETC run.

Visit

Proposal 15617, Setups 1+2 (01), implementation Fri Dec 14 16:02:39 GMT 2018

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Diagnostics

(Setup1: Ha Narrow+ Broad (01.001)) Warning (Form): POS TARG & PATTERN should be used carefully with ACS ramp filters as central wavelengths & transmission efficiencies vary within the apertures.

(Setup2: Ha Narrow+ red Broad (01.002)) Warning (Form): POS TARG & PATTERN should be used carefully with ACS ramp filters as central wavelengths & transmission efficiencies vary within the apertures.

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), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	J1047+0739 Alt Name1: SDSS-J104755.92+073951.1	RA: 10 47 55.9224 (161.9830100d) Dec: +07 39 51.23 (7.66423d) Equinox: J2000	Redshift: 0.16828	V=19.0+/-0.1 i=18.4 AB, F_Ha, narrow=2.0e14 (13Ang), F_Ha, broad=2.9e14 (42Ang), F_[NII], 6583=6.9e16 erg/s/cm2 (13Ang) .	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[BLR, DWARF COMPACT, EMISSION LINE NEBULA, SEYFERT, STARBURST]
Extended=YES

Exposures

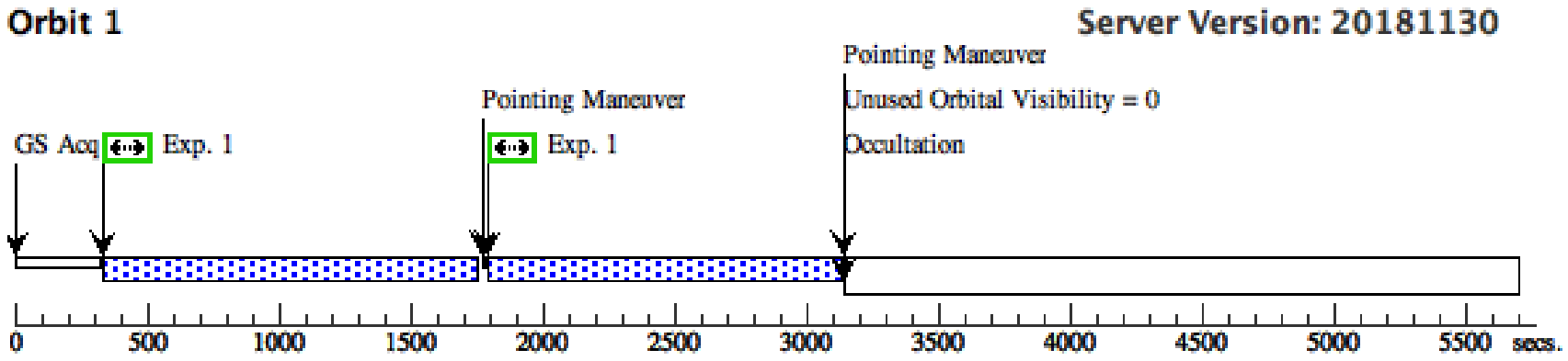
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Setup1: Ha Narrow+ Broad	(1) J1047+0739	ACS/WFC, ACCUM, WFC2-ORAMPQ	FR782N 7669.0 A			Pattern 1, Exps 1-1 in Setups 1+2 (01) (1)	1216 Secs (4977 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>(Pattern 3)] *[==>1329.0 Secs (Pattern 4)]*	***[2]***

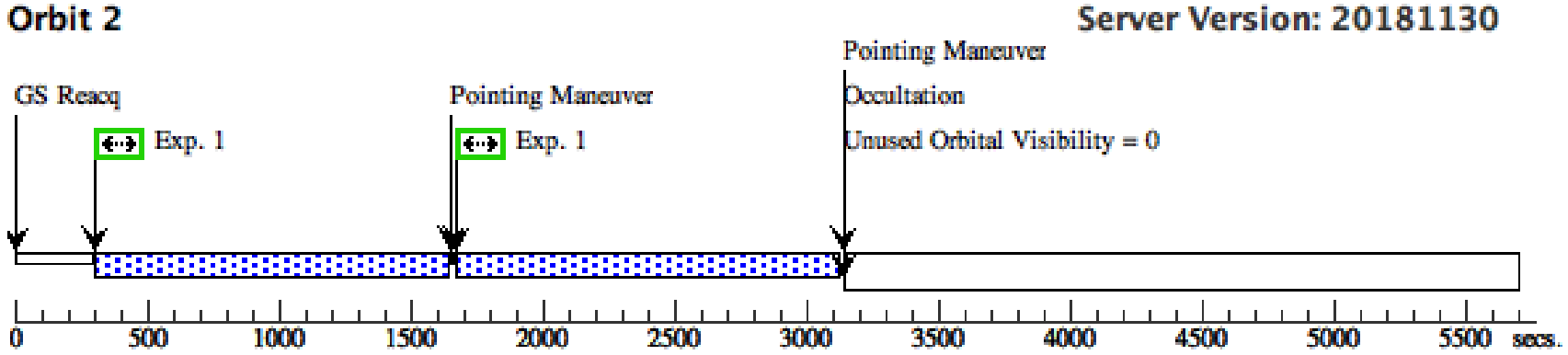
Comments: ACS-WFC Ramp-filter ETC would not work

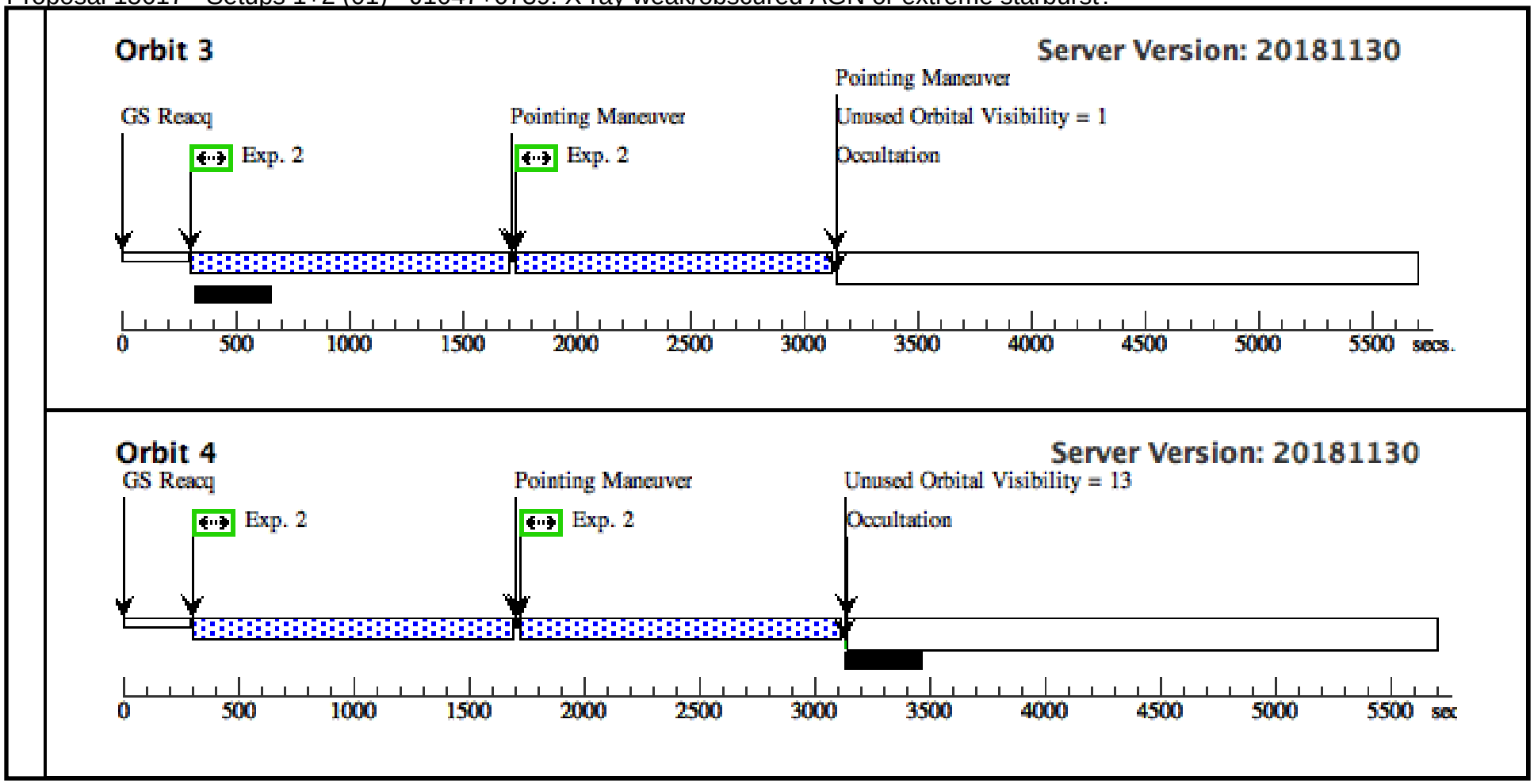
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	Setup2: Ha Narrow+ red Broad	(1) J1047+0739	ACS/WFC, ACCUM, WFC2-ORAMPQ	FR782N 7755.0 A			Pattern 1, Exps 2-2 in Setups 1+2 (01) (1)	1266 Secs (5064 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[3]***
								[==>(Pattern 3)] *[==>(Pattern 4)]*	***[4]***

Comments: ACS-WFC Ramp-filter ETC would not work

Orbit Structure



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Server Version: 20181130
GS Reacq
Exp. 2
Pointing Maneuver
Exp. 2
Pointing Maneuver
Unused Orbital Visibility = 1
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.
Orbit 4
Server Version: 20181130
GS Reacq
Exp. 2
Pointing Maneuver
Exp. 2
Unused Orbital Visibility = 13
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 15617, Setups 3+4 (02), implementation Fri Dec 14 16:02:39 GMT 2018

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Diagnostics

(Setup4: continuum (02.001)) Warning (Form): POS TARG & PATTERN should be used carefully with ACS ramp filters as central wavelengths & transmission efficiencies vary within the apertures.

(Setup3: Ha Narrow+ blue Broad (02.002)) Warning (Form): POS TARG & PATTERN should be used carefully with ACS ramp filters as central wavelengths & transmission efficiencies vary within the apertures.

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#	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), (2)

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Comments:
Category=GALAXY
Description=[BLR, DWARF COMPACT, EMISSION LINE NEBULA, SEYFERT, STARBURST]
Extended=YES

Exposures

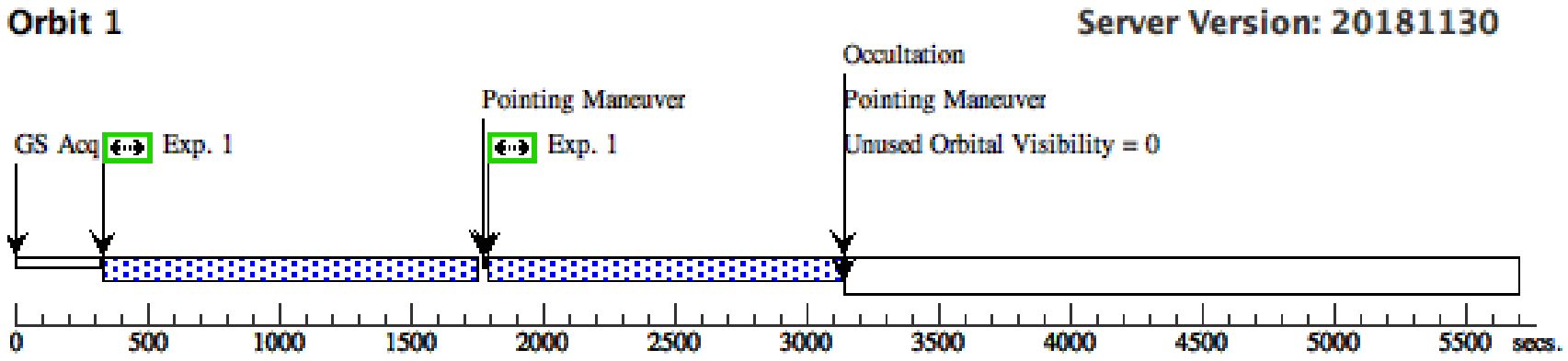
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Setup4: continuum	(1) J1047+0739	ACS/WFC, ACCUM, WFC2-ORAMPQ	FR782N 7474.0 A			Pattern 1, Exps 1-1 in Setups 3+4 (02) (1)	1216 Secs (4977 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>(Pattern 3)] *[==>1329.0 Secs (Pattern 4)]*	***[2]***

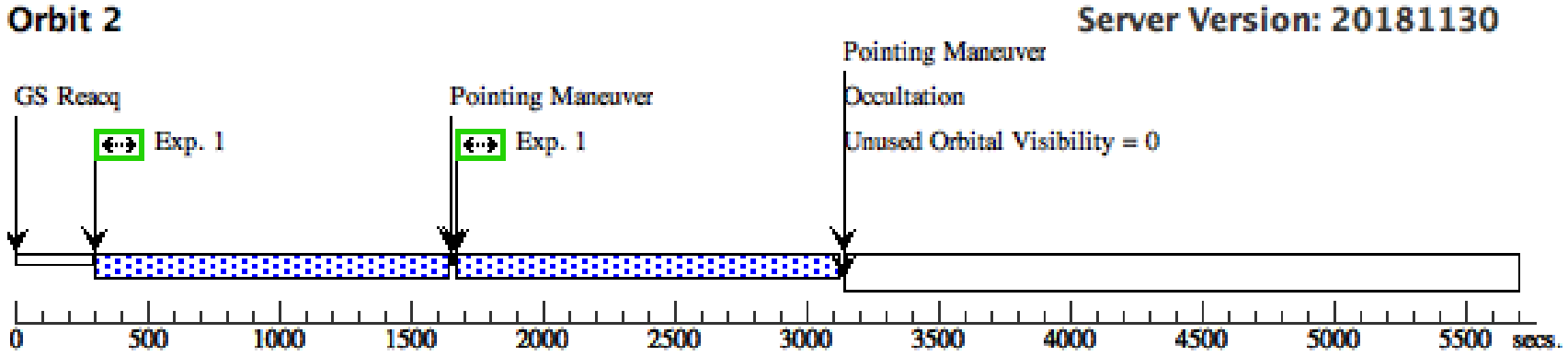
Comments: ACS-WFC Ramp-filter ETC would not work

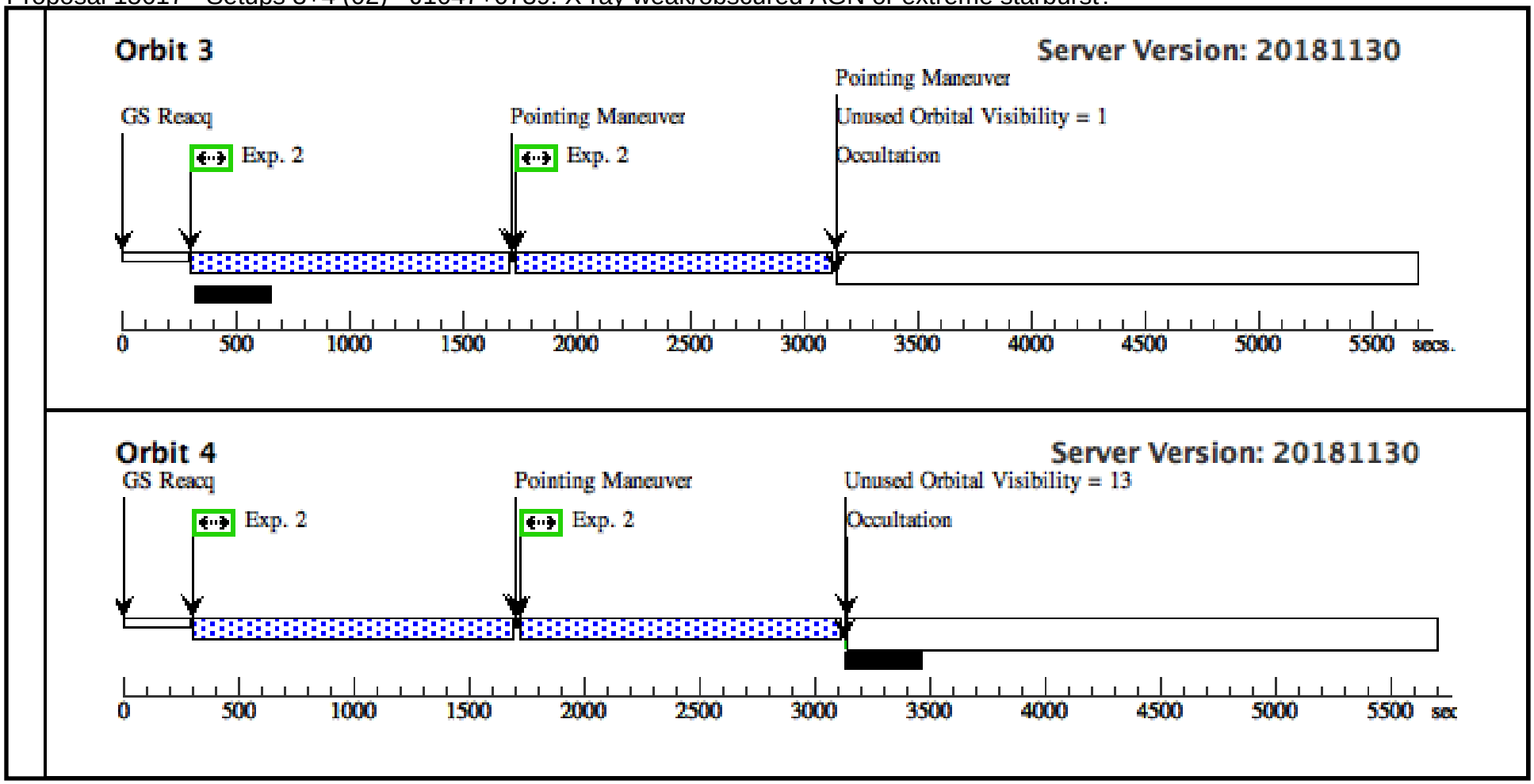
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	Setup3: Ha Narrow+ blue Broad	(1) J1047+0739	ACS/WFC, ACCUM, WFC2-ORAMPQ	FR782N 7583.0 A			Pattern 1, Exps 2-2 in Setups 3+4 (02) (1)	1266 Secs (5064 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[3]***
								[==>(Pattern 3)] *[==>(Pattern 4)]*	***[4]***

Comments: ACS-WFC Ramp-filter ETC would not work

Orbit Structure






Orbit 3
Server Version: 20181130
GS Reacq
Exp. 2
Pointing Maneuver
Exp. 2
Pointing Maneuver
Unused Orbital Visibility = 1
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.
Orbit 4
Server Version: 20181130
GS Reacq
Exp. 2
Pointing Maneuver
Exp. 2
Unused Orbital Visibility = 13
Occultation
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1000
1500
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sec