10848 - Relating the host galaxies of type-2 quasars to their infrared properties

Cycle: 15, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets*	*Configurations*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) SST171106.8+590436	ACS/WFC	2	12-May-2006 21:14:26.0	yes
02	(2) SST171147.4+585839	ACS/WFC	2	12-May-2006 21:14:35.0	yes
03	(3) SST171324.3+585549	ACS/WFC	2	12-May-2006 21:14:42.0	yes
04	(4) SST171831.6+595317	ACS/WFC	2	12-May-2006 21:14:50.0	yes
05	(5) SST172123.1+601214	ACS/WFC	2	12-May-2006 21:14:56.0	yes
06	(6) SST172458.3+591545	ACS/WFC	2	12-May-2006 21:15:02.0	yes

12 Total Orbits Used

ABSTRACT

The obscured quasar population has been found to consist of a wide variety of objects. In this proposal, we wish to study the host galaxies of six z~0.6 type-2 quasars selected via their mid-infrared emission. Infrared spectra and photometry of these objects show that they include both actively star-forming and non-starforming galaxies, and have dust columns to the AGN ranging from moderate to high. We will relate the host galaxy properties to the infrared properties of these type-2 quasars, and to the host galaxies of type-1 quasars of similar redshift and bolometric luminosity. These observations will thus help us to understand how the different types of obscured quasars are related to each other, and to the normal quasar population.

OBSERVING DESCRIPTION

The hosts of our type-2 quasars have i-magnitudes ranging from 18.7-20.7. Most of our imaging will be performed through the F775W and F475W filters (SDSS i and g), sampling each object either side of the 4000A break in the rest frame. For our two highest-redshift objects we will use F814W and F555W, both to keep the rest-wavelength approximately the same, and to help compensate for cosmological surface brightness dimming by using wider bandpasses. Our lowest-redshift object will be observed through F625W and F435W. In some cases our filters will include emission lines such as [OII]3727 and [OIII]5007, however, AGN-powered extended emission line nebulae on scales of kpc are rare in radio-quiet quasars, and we can include any contributions from low equivalent width [OII] and [OIII] emission from star formation in our spectral modeling.

For our faintest, highest redshift host galaxies, we want to ensure a high enough signal-to-noise to be able to detect faint features and measure an accurate host galaxy magnitude. The i=20.7 magnitude host galaxy of our most distant quasar-2, if it has an effective radius or 0.5" (i.e. ~5kpc), will have a surface brightness of approx 23 mag/arcsec^2 at a radius of 0.5". Using the ACS ETC, we can achieve a 6-sigma detection of this in a 2x2-pixel box in 4x500s of integration through the F814W filter, so a single orbit will suffice to obtain sufficiently deep, well-dithered data. The type-2 host galaxies to be observed through the F775W filter are at least 0.5 mag brighter, so will have similar or better signal-to-noise despite the smaller filter bandwidth. Because of the approx 4x increased sensitivity of the ACS WFC compared to WFPC2, we can achieve similar rest-frame surface brightness limits as, e.g., Dunlop et al. (2003) in their study of z~0.3 quasar hosts for our <z_med>=0.6 sample, despite cosmological surface brightness dimming. We therefore expect to be similarly-sensitive to low surface brightness tidal features and other evidence galaxy interactions. In

the shorter wavelength band, our worst case is a g=21.9 host galaxy observed through F475W, but even here we will be able to obtain a 3-sigma detection 0.5" from the nucleus in a 2x2-pixel box in 4x500s of integration assuming the same host galaxy scale size, so again one orbit per object should suffice in the short wavelength filter. With the resolution of ACS, we will be probing kpc-scale structures in the host galaxies. If, as expected, our host galaxies show star-forming knots and other discrete features, such as secondary nuclei, these will be even easier to detect than the diffuse stellar light of the older stellar population.

Visit

Proposal 10848, Visit 01 Sat May 13 01:15:04 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 15.0D TO 360.0 D

Comments: Orient requirements are to avoid bright star in WF2

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false		(1), (2)

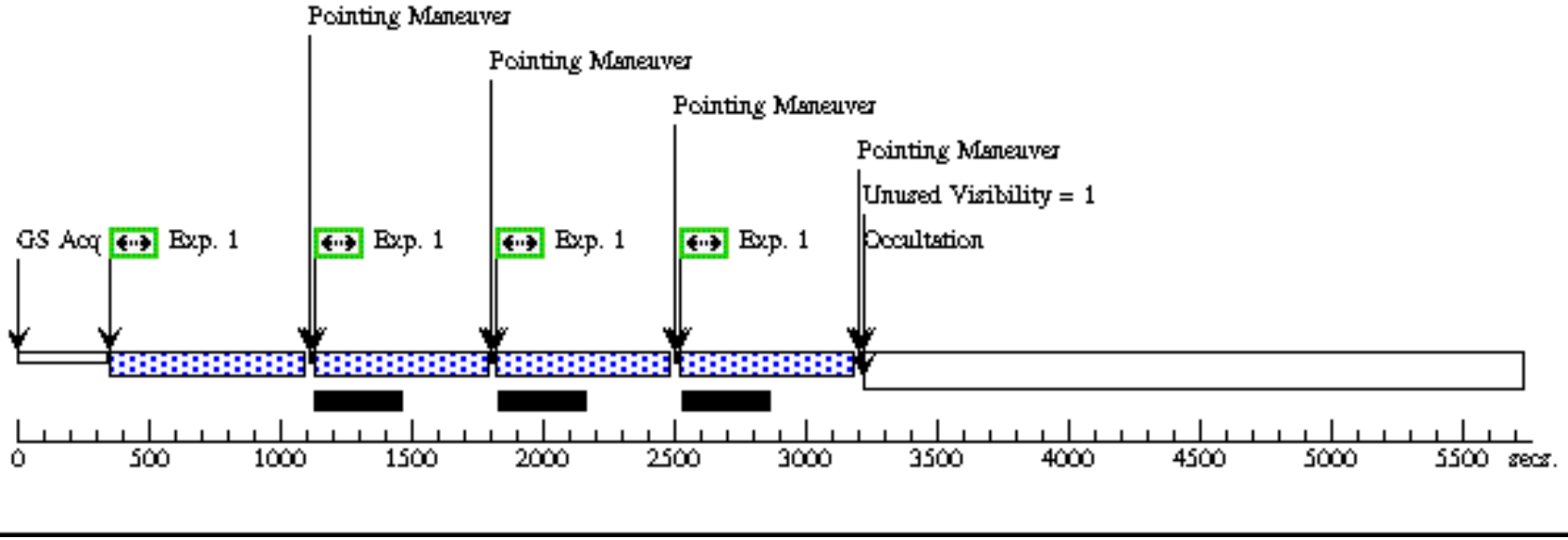
Fixed Targets

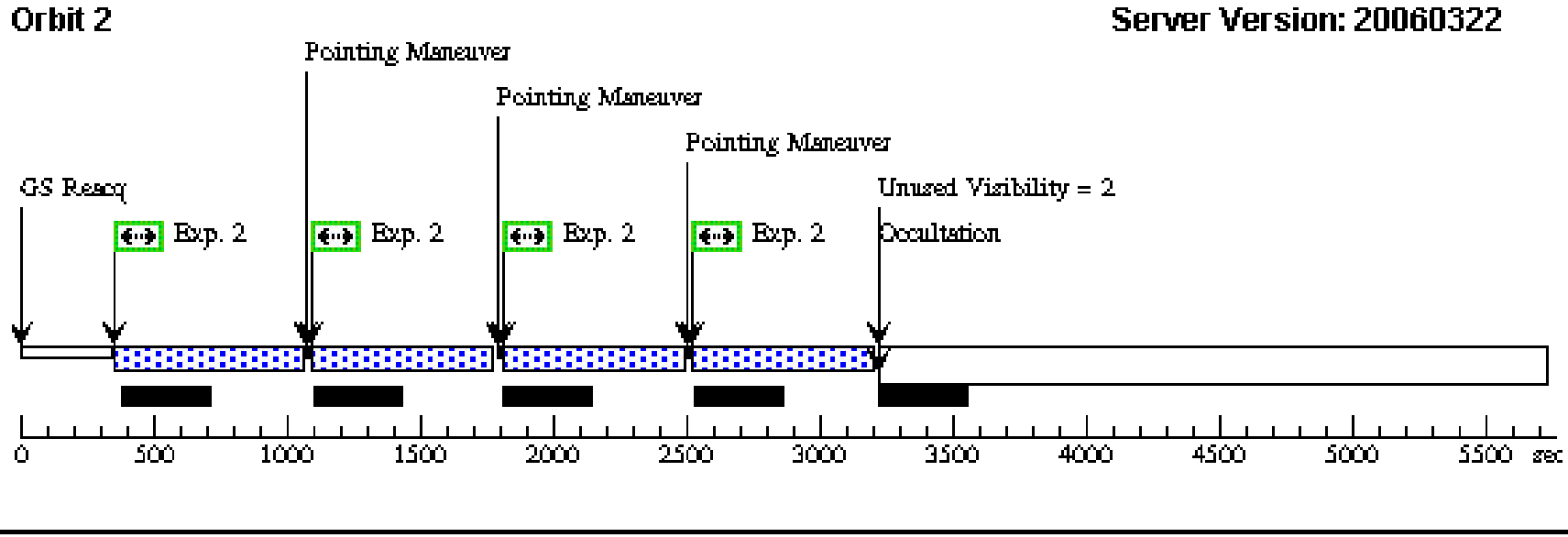
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SST171106.8+590436	RA: 17 11 6.8400 (257.7785000d) Dec: +59 04 36.70 (59.07686d) Equinox: J2000	Redshift: 0.462	V=21.0	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) SST171106.8+590436	ACS/WFC, ACCUM, WFC1	F775W	CR-SPLIT=NO; GAIN=2		Pattern 1-1 (1)	540.0 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2		(1) SST171106.8+590436	ACS/WFC, ACCUM, WFC1	F475W	CR-SPLIT=NO; GAIN=2		Pattern 2-2 (1)	540.0 Secs	
								[==>559.0 Secs (Pattern 1)] *[==>559.0 Secs (Pattern 2)]* *[==>559.0 Secs (Pattern 3)]* *[==>559.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 10848, Visit 02 Sat May 13 01:15:05 GMT 2006

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=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false		(1), (2)

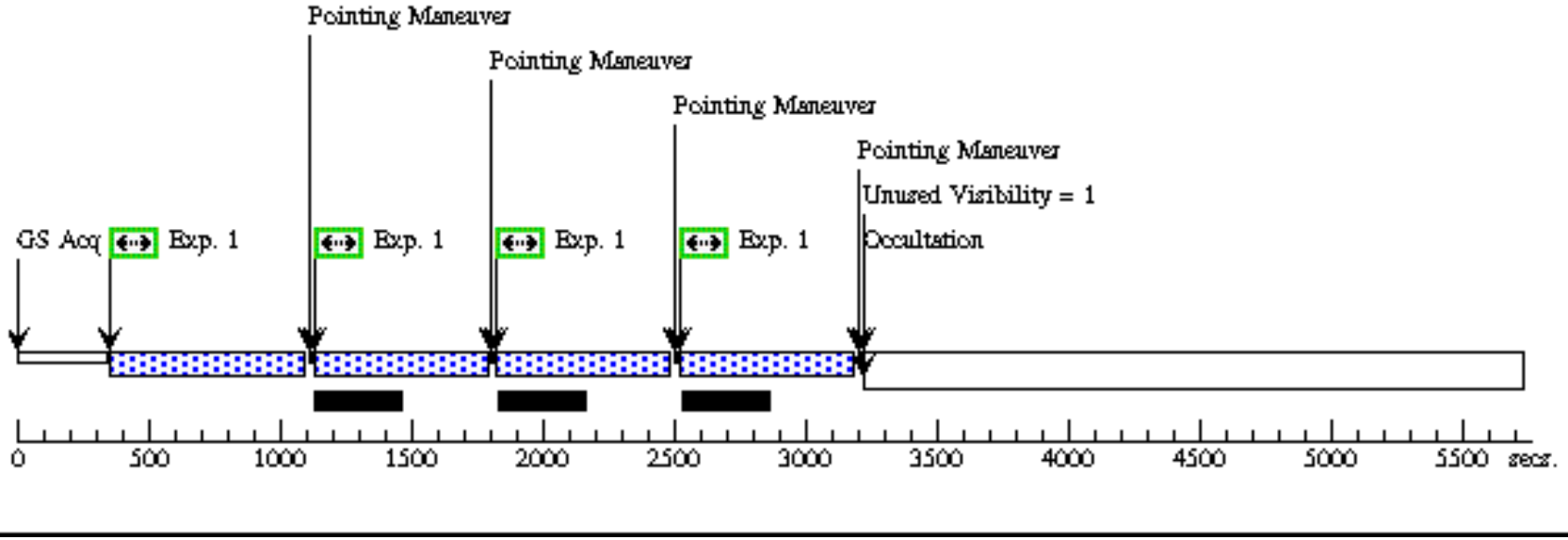
Fixed Targets

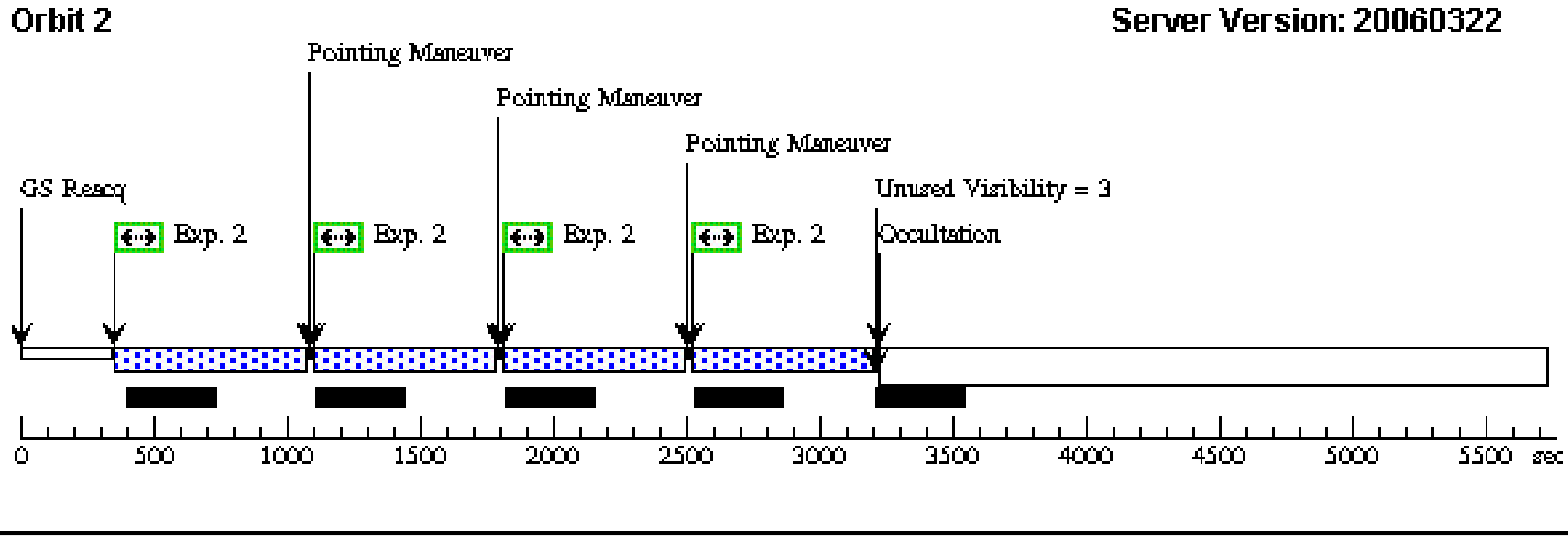
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SST171147.4+585839	RA: 17 11 47.4700 (257.9477917d) Dec: +58 58 39.80 (58.97772d) Equinox: J2000	Redshift: 0.8	V=22.0	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(2) SST171147.4+585839	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=NO; GAIN=2		Pattern 1-1 (1)	540.0 Secs *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2		(2) SST171147.4+585839	ACS/WFC, ACCUM, WFC1	F555W	CR-SPLIT=NO; GAIN=2		Pattern 2-2 (1)	540.0 Secs *[==>555.0 Secs (Pattern 1)]* *[==>555.0 Secs (Pattern 2)]* *[==>555.0 Secs (Pattern 3)]* *[==>555.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 10848, Visit 03 Sat May 13 01:15:07 GMT 2006

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=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false		(1), (2)

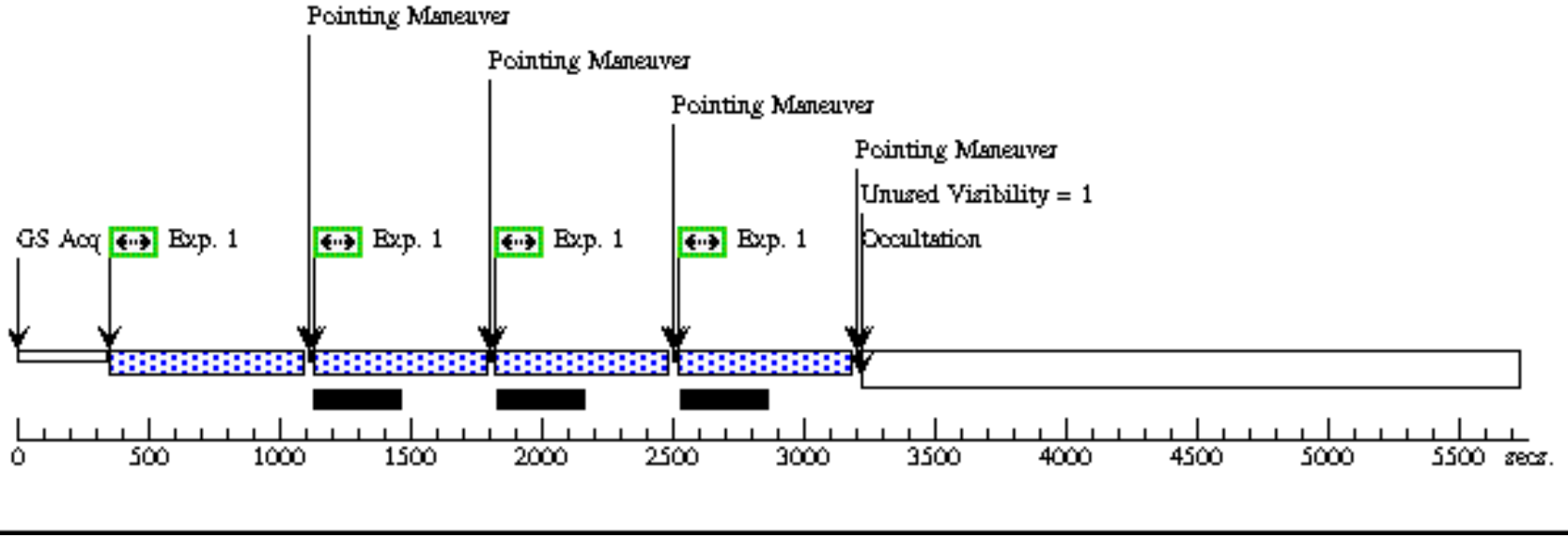
Fixed Targets

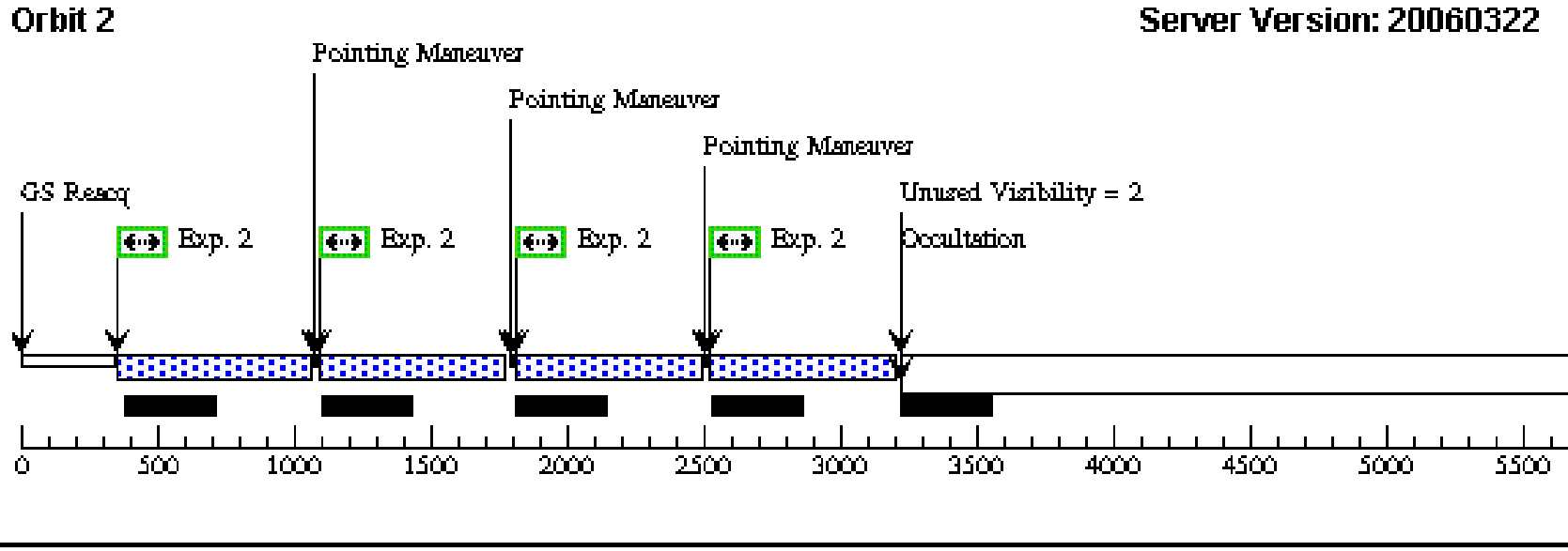
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	SST171324.3+585549	RA: 17 13 24.1900 (258.3507917d) Dec: +58 55 49.30 (58.93036d) Equinox: J2000	Redshift: 0.609	V=21.5	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(3) SST171324.3+585549	ACS/WFC, ACCUM, WFC1	F775W	CR-SPLIT=NO; GAIN=2		Pattern 1-1 (1)	540.0 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2		(3) SST171324.3+585549	ACS/WFC, ACCUM, WFC1	F475W	CR-SPLIT=NO; GAIN=2		Pattern 2-2 (1)	540.0 Secs	
								[==>559.0 Secs (Pattern 1)] *[==>559.0 Secs (Pattern 2)]* *[==>559.0 Secs (Pattern 3)]* *[==>559.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 10848, Visit 04 Sat May 13 01:15:07 GMT 2006

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=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false		(1), (2)

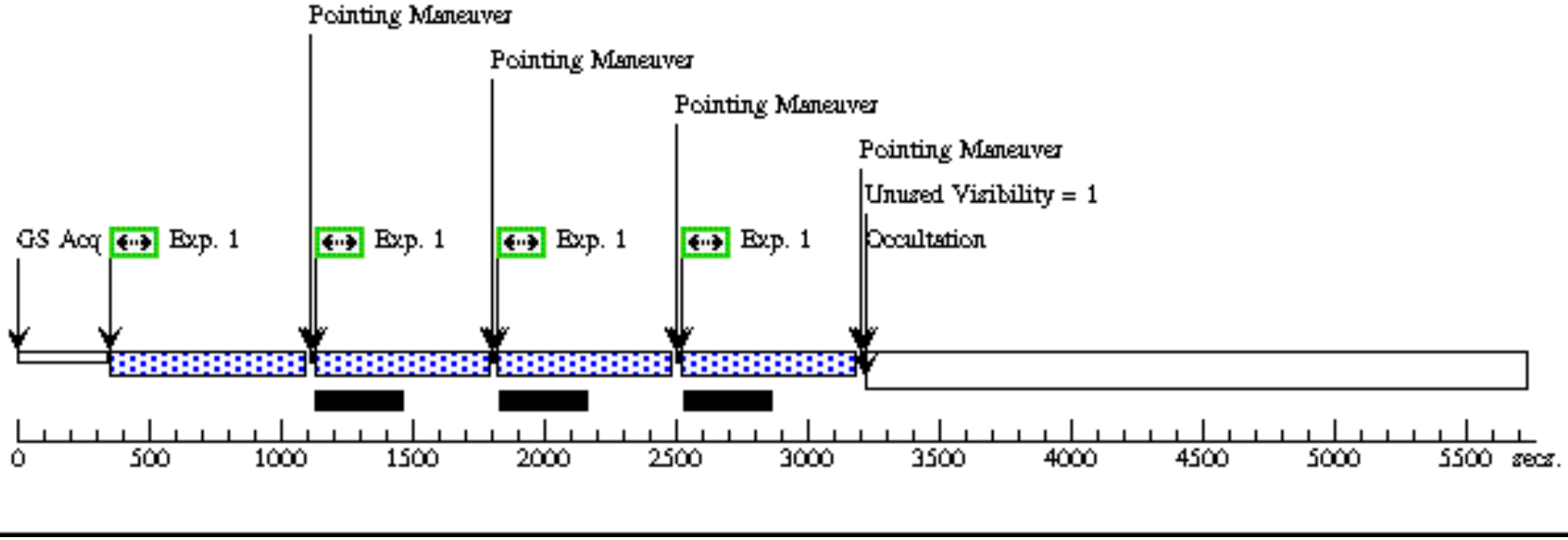
Fixed Targets

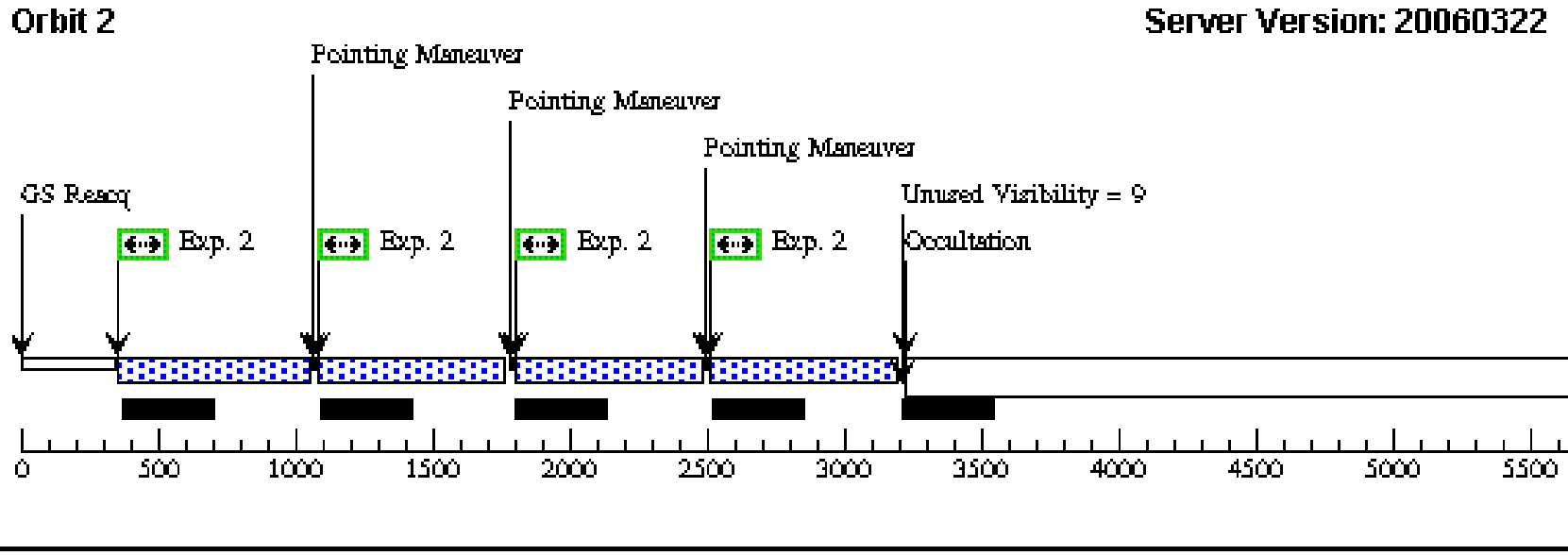
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SST171831.6+595317	RA: 17 18 31.7100 (259.6321250d) Dec: +59 53 17.30 (59.88814d) Equinox: J2000	Redshift: 0.7	V=21.5	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(4) SST171831.6+595317	ACS/WFC, ACCUM, WFC1	F775W	CR-SPLIT=NO; GAIN=2		Pattern 1-1 (1)	540.0 Secs *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2		(4) SST171831.6+595317	ACS/WFC, ACCUM, WFC1	F555W	CR-SPLIT=NO; GAIN=2		Pattern 2-2 (1)	540.0 Secs *[==>559.0 Secs (Pattern 1)]* *[==>559.0 Secs (Pattern 2)]* *[==>559.0 Secs (Pattern 3)]* *[==>559.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 10848, Visit 05 Sat May 13 01:15:08 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 0.0D TO 20.0 D; ORIENT 60.0D TO 120.0 D; ORIENT 140.0D TO 165.0 D; ORIENT 280.0D TO 290.0 D; ORIENT 320.0D TO 359.99 D

Comments: Orient requirements are to avoid bleed trails along columns and rows from nearby bright star.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false		(1), (2)

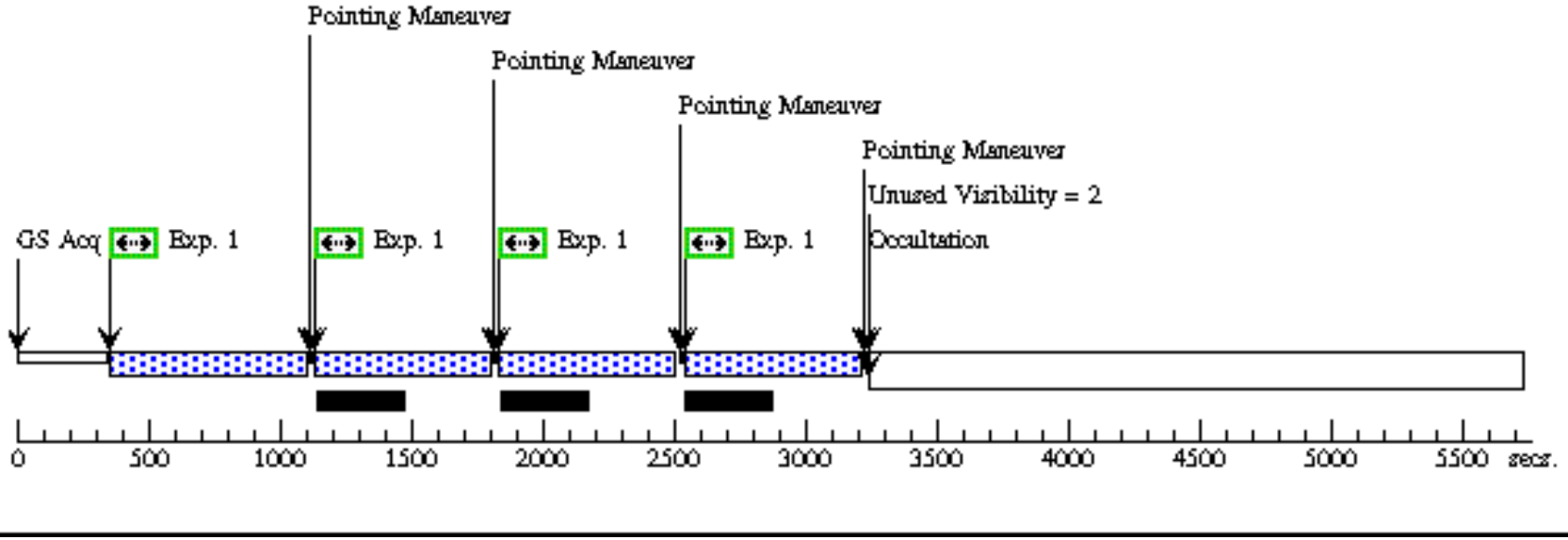
Fixed Targets

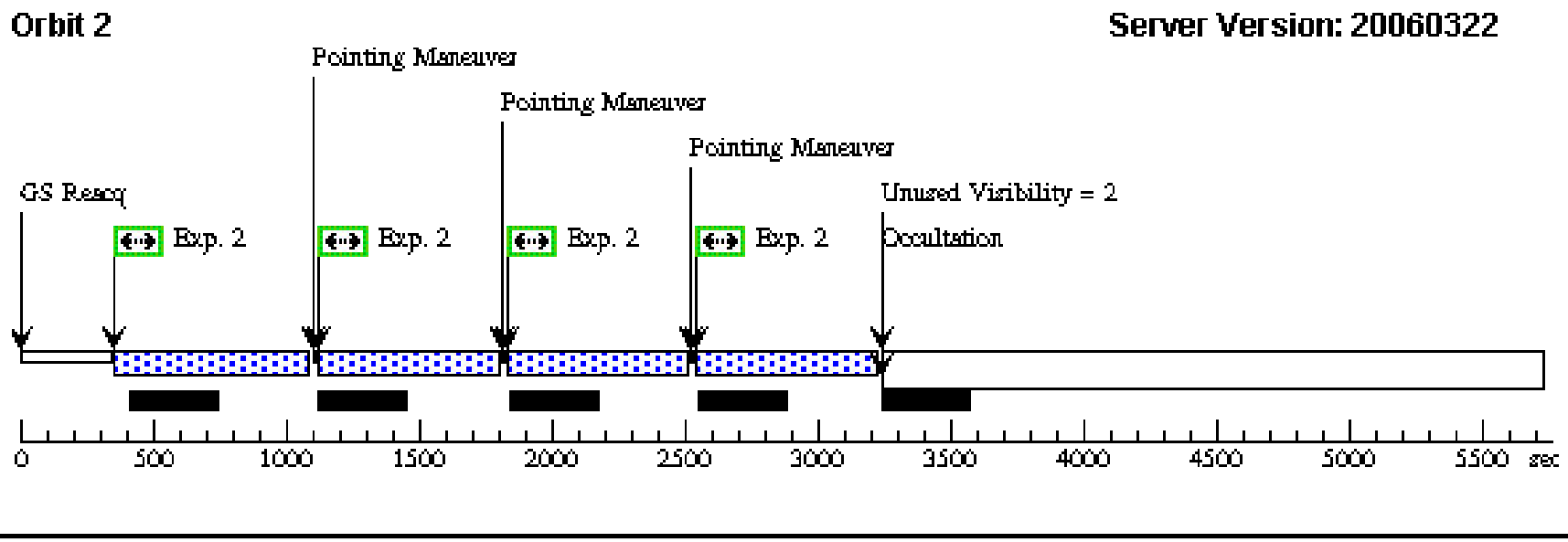
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	SST172123.1+601214	RA: 17 21 23.1800 (260.3465833d) Dec: +60 12 14.60 (60.20406d) Equinox: J2000	Redshift: 0.325	V=20.0	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(5) SST172123.1+601214	ACS/WFC, ACCUM, WFC1	F625W	CR-SPLIT=NO; GAIN=2		Pattern 1-1 (1)	540.0 Secs	
								[==>545.0 Secs (Pattern 1)] *[==>545.0 Secs (Pattern 2)]* *[==>545.0 Secs (Pattern 3)]* *[==>545.0 Secs (Pattern 4)]*	***[1]***
2		(5) SST172123.1+601214	ACS/WFC, ACCUM, WFC1	F435W	CR-SPLIT=NO; GAIN=2		Pattern 2-2 (1)	540.0 Secs	
								[==>557.0 Secs (Pattern 1)] *[==>557.0 Secs (Pattern 2)]* *[==>557.0 Secs (Pattern 3)]* *[==>557.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 10848, Visit 06 Sat May 13 01:15:08 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 0.0D TO 110.0 D; ORIENT 270.0D TO 359.99 D

Comments: Orient requirements are to avoid bright stars in WF2.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	SST172458.3+591545	RA: 17 24 58.3400 (261.2430833d) Dec: +59 15 45.80 (59.26272d) Equinox: J2000	Redshift: 0.494	V=21.0	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(6) SST172458.3+591545	ACS/WFC, ACCUM, WFC1	F775W	CR-SPLIT=NO; GAIN=2		Pattern 1-1 (1)	540.0 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2		(6) SST172458.3+591545	ACS/WFC, ACCUM, WFC1	F475W	CR-SPLIT=NO; GAIN=2		Pattern 2-2 (1)	540.0 Secs	
								[==>559.0 Secs (Pattern 1)] *[==>559.0 Secs (Pattern 2)]* *[==>559.0 Secs (Pattern 3)]* *[==>559.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure