13116 - Probing The Causes of the High/Low Jet Power Dichotomy in AGN Jets with Chandra and HST

Cycle: 20, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) 1045-188	WFC3/IR WFC3/UVIS	2	08-Apr-2013 21:03:35.0	yes
02	(2) 1849+670	WFC3/IR WFC3/UVIS	2	08-Apr-2013 21:03:44.0	yes
03	(3) 2216-038	WFC3/IR WFC3/UVIS	2	08-Apr-2013 21:03:52.0	yes

6 Total Orbits Used

ABSTRACT

We propose for deep Chandra-HST observations of 3 hybrid MOJAVE quasars. As these sources have jets with different powers (Fanaroff-Riley type I & II) on either side of the central engine they could be the touchstone for ideas put forth to explain the question of the FR dichotomy and the nature of AGN jets in general. These deep observations will constrain unambiguously the X-ray emission mechanisms in these jets through the construction and modeling of broad-band SEDs at multiple jet positions. The X-ray imaging may reveal asymmetries in the hot gas on either side of the AGN, telling us about jet propagation in low/high power sources. The lack of such features may provide support to the idea of highly magnetized jets, which could be examined further through broad-band SED modeling.

OBSERVING DESCRIPTION

We will observe the 3 quasars with arcsecond-scale radio jets, viz., 1045-188, 1849+670 and 2216-038, through the Wide Field Camera 3 (WFC3) on board HST, through the F160W (IR channel) and the F475W (UVIS channel) filters. The aim is to detect optical emission at various locations or knots along the jets of these quasars. Spectral index images will be made for these jet knots to understand the jet emission mechanism(s). Each target will be observed through each of the 2 filters (F160W and F475W) for 1 HST orbit each, giving a total of 6 orbits. Each orbit/visit is divided into 3 (sub-)exposures to create a 3-point LINE DITHER pattern.

Visit

Proposal 13116, Visit 01, implementation Tue Apr 09 01:03:59 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, WFC3/UVIS

Special Requirements: ORIENT 62D TO 102 D; ORIENT 152D TO 192 D; ORIENT 242D TO 282 D; ORIENT 332D TO 12 D

Comments: Observing 1045-188 through IR filter F160W and UVIS filter F475W

Jet PA = 127 deg

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)
(2)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(2)

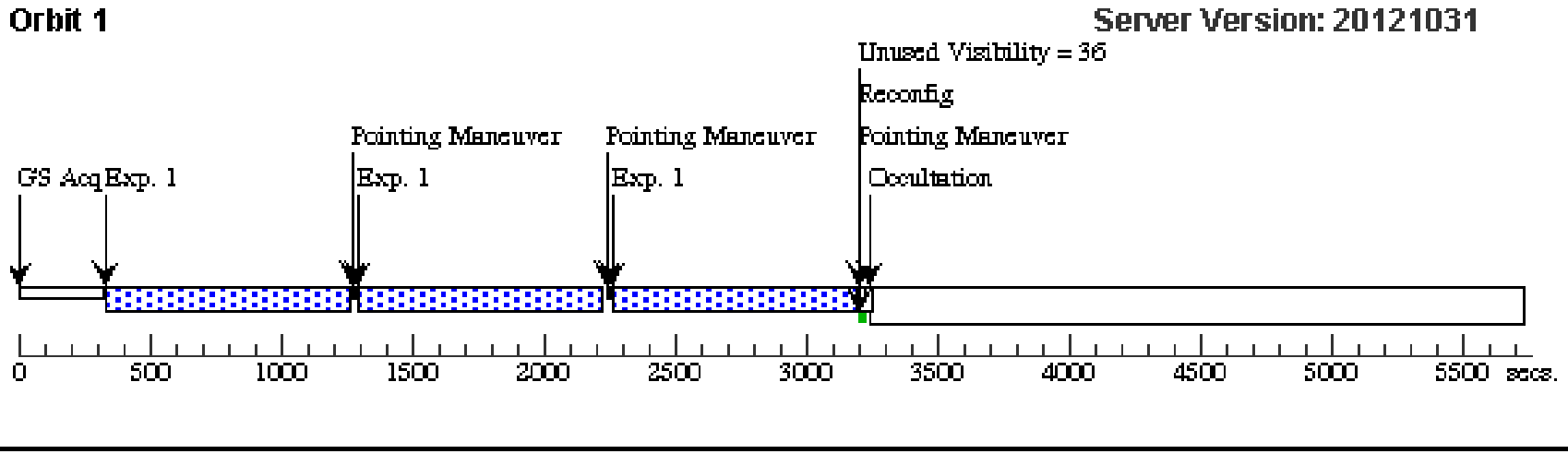
Fixed Targets

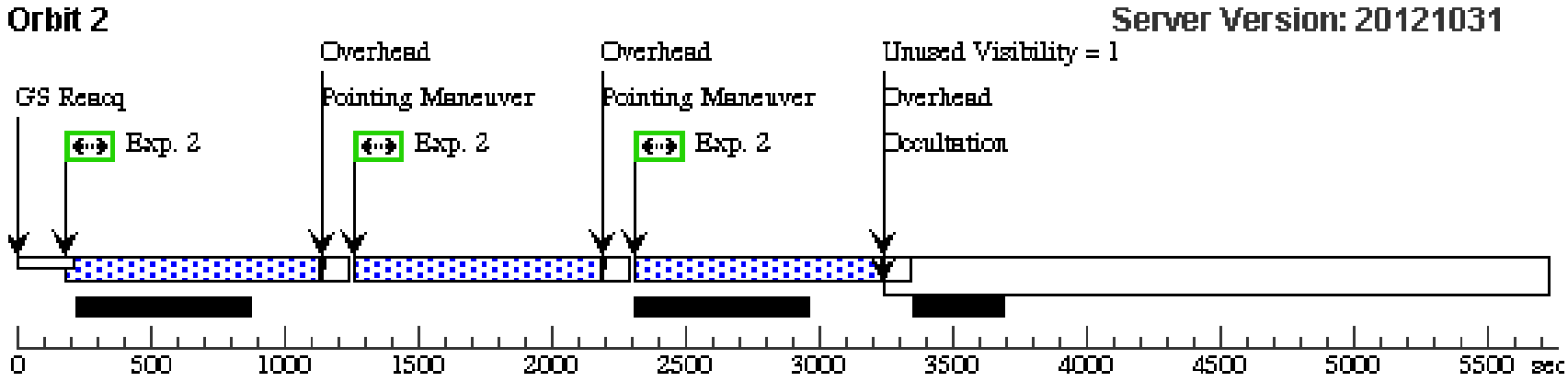
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	1045-188	RA: 10 48 6.6000 (162.0275000d) Dec: -19 09 36.00 (-19.16000d) Equinox: J2000	Redshift: 0.595000	V=18.2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) 1045-188	WFC3/IR, MULTIACCUM, IR-UVIS-FIX	F160W	NSAMP=10; SAMP-SEQ=SPARS100		Pattern 1, Exps 1-1 in Visit 01 (1)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(1) 1045-188	WFC3/UVIS, ACCUM, UVIS-IR-FIX	F475W		POS TARG 0,20	Pattern 2, Exps 2-2 in Visit 01 (2)	433 Secs *[==>919.0 Secs (Pattern 1)]* *[==>919.0 Secs (Pattern 2)]* *[==>919.0 Secs (Pattern 3)]*	***[2]***

Orbit Structure





Visit

Proposal 13116, Visit 02, implementation Tue Apr 09 01:04:02 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, WFC3/UVIS

Special Requirements: ORIENT 32D TO 72 D; ORIENT 122D TO 162 D; ORIENT 212D TO 252 D; ORIENT 302D TO 342 D

Comments: Observing 1849+670 through IR filter F160W and UVIS filter F475W

Jet PA = 7 deg

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)
(2)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(2)

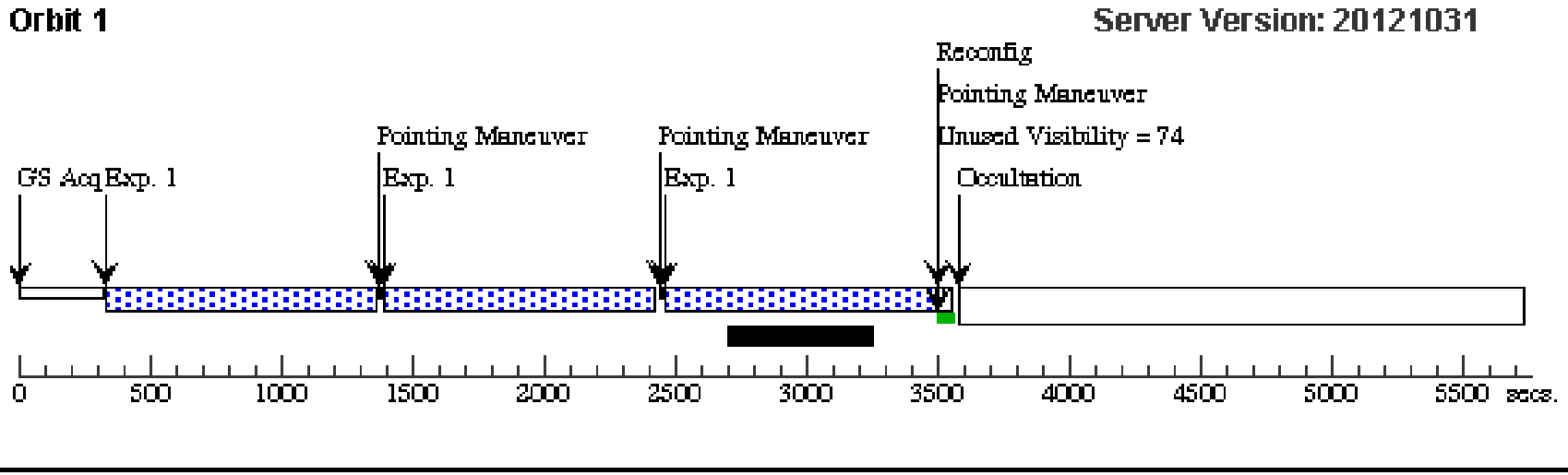
Fixed Targets

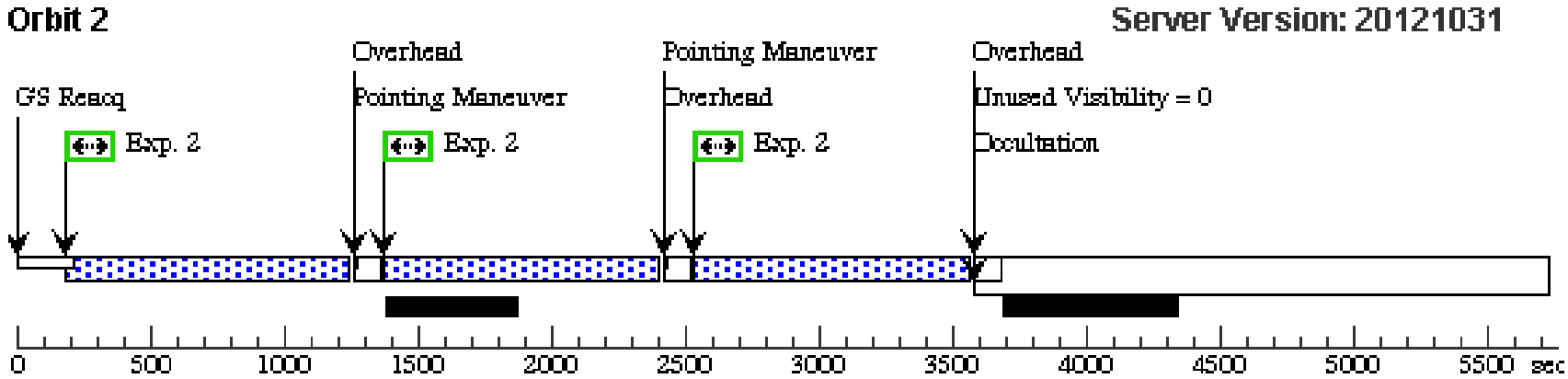
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	1849+670	RA: 18 49 16.1000 (282.3170833d) Dec: +67 05 42.00 (67.09500d) Equinox: J2000	Redshift: 0.657000	V=17.9	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(2) 1849+670	WFC3/IR, MULTIACCUM, IR-UVIS-FIX	F160W	NSAMP=11; SAMP-SEQ=SPARS100		Pattern 1, Exps 1-1 in Visit 02 (1)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(2) 1849+670	WFC3/UVIS, ACCUM, UVIS-IR-FIX	F475W		POS TARG 0,20	Pattern 2, Exps 2-2 in Visit 02 (2)	433 Secs *[==>1032.0 Secs (Pattern 1)]* *[==>1032.0 Secs (Pattern 2)]* *[==>1032.0 Secs (Pattern 3)]*	***[2]***

Orbit Structure





Visit

Proposal 13116, Visit 03, implementation Tue Apr 09 01:04:04 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, WFC3/UVIS

Special Requirements: ORIENT 75D TO 115 D; ORIENT 165D TO 205 D; ORIENT 241D TO 295 D; ORIENT 345D TO 25 D

Comments: Observing 2216-038 through IR filter F160W and UVIS filter F475W

Jet PA = 140 deg

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)
(2)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	2216-038	RA: 22 18 52.0000 (334.7166667d) Dec: -03 35 37.00 (-3.59361d) Equinox: J2000	Redshift: 0.901000	V=16.52	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(3) 2216-038	WFC3/IR, MULTIACCUM, IR-UVIS-FIX	F160W	NSAMP=10; SAMP-SEQ=SPARS100	GS ACQ SCENARIO BASE1B3	Pattern 1, Exps 1-1 in Visit 03 (1)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(3) 2216-038	WFC3/UVIS, ACCUM, UVIS-IR-FIX	F475W		POS TARG 0,30	Pattern 2, Exps 2-2 in Visit 03 (2)	433 Secs *[==>914.0 Secs (Pattern 1)]* *[==>914.0 Secs (Pattern 2)]* *[==>914.0 Secs (Pattern 3)]*	***[2]***

Orbit Structure