



## 12322 - Detecting Isolated Black Holes through Astrometric Microlensing

Cycle: 18, Proposal Category: GO

(Availability Mode: AVAILABLE)

### INVESTIGATORS

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### VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(9) MOA-2010-BLG-482	WFC3/UVIS	1	12-Oct-2011 21:01:41.0	yes
02	(10) MOA-2010-BLG-364	WFC3/UVIS	1	12-Oct-2011 21:01:53.0	yes
03	(10) MOA-2010-BLG-364	WFC3/UVIS	1	12-Oct-2011 21:02:03.0	yes
04	(7) MOA-2009-BLG-260	WFC3/UVIS	1	12-Oct-2011 21:02:11.0	yes
05	(10) MOA-2010-BLG-364	WFC3/UVIS	1	12-Oct-2011 21:02:20.0	yes
06	(11) OGLE-2011-BLG-462	WFC3/UVIS	1	12-Oct-2011 21:02:29.0	yes
07	(12) OGLE-2011-BLG-0037	WFC3/UVIS	1	12-Oct-2011 21:02:43.0	yes
08	(6) OGLE-2011-BLG-310	WFC3/UVIS	1	12-Oct-2011 21:02:53.0	yes
09	(12) OGLE-2011-BLG-0037	WFC3/UVIS	1	12-Oct-2011 21:03:06.0	yes
10	(7) MOA-2009-BLG-260	WFC3/UVIS	1	12-Oct-2011 21:03:13.0	yes

10 Total Orbits Used

## **ABSTRACT**

This proposal aims to make the first detection of isolated stellar-mass black holes (BHs) in the Milky Way, and to determine their masses. Until now, the only directly measured BH masses have come from radial-velocity measurements of X-ray binaries. Our proposed method uses the astrometric shifts that occur when a Galactic-bulge microlensing event is caused by a BH lens. Out of the hundreds of bulge microlensing events found annually by the OGLE and MOA surveys, a few are found to have very long durations ( $>200$  days). It is generally believed that the majority of these long-duration events are caused by lenses that are isolated BHs.

To test this hypothesis, we will carry out high-precision astrometry of 5 long-duration events, using the WFC. The expected astrometric signal from a BH lens is  $>1.4$  mas, at least 7 times the demonstrated astrometric precision attainable with the WFC.

This proposal will thus potentially lead to the first unambiguous detection of isolated stellar-mass BHs, and the first direct mass measurement for isolated stellar-mass BHs through any technique. Detection of several BHs will provide information on the frequency of BHs in the Galaxy, with implications for the slope of the IMF at high masses, the minimum mass of progenitors that produce BHs, and constraints on theoretical models of BH formation.

## **OBSERVING DESCRIPTION**

We will select long-duration events which do not show any light contribution from the lens. In addition, the events should have reasonably high amplifications which will ensure that the centroid shift is close to zero at the peak amplification, and will facilitate detection of the parallax signal and hence the distance estimate for the lens. It is easy to identify long-duration events and to determine their time of peak amplification well before the actual peak. Our group includes members of the microlensing survey teams who have access to the survey data for proper selection of such events.

To guard against the possibility that the geometric distortion may be dependant on the location on the detector; we will position the target at different locations along close-to-central-x-axis of the of the detector.

We will take most images in a single filter, but also take a small number of images in a different filter to check the color dependency, if any, of the

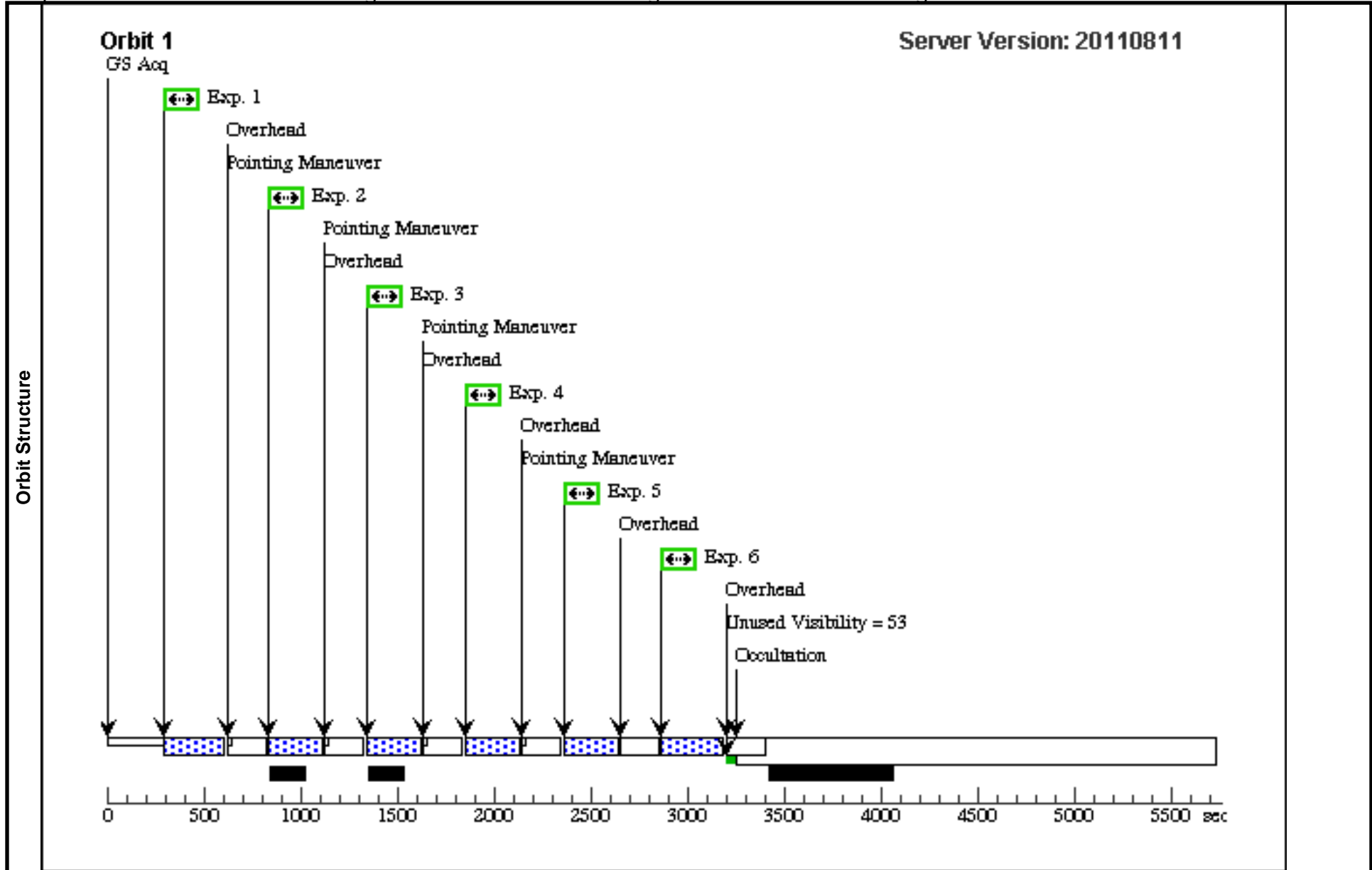
astrometric shift.

We will try to take as many images as possible in a single ORIENT for better astrometry accuracy. However, maintaining a single ORIENT may not be possible for all the observations. Since almost all of our targets are close to the ecliptic, we plan to use the same orient for nearly half of the year, and then flip it by 180 deg.

Proposal 12322 - Visit 01 - Detecting Isolated Black Holes through Astrometric Microlensing

Thu Oct 13 01:03:22 GMT 2011

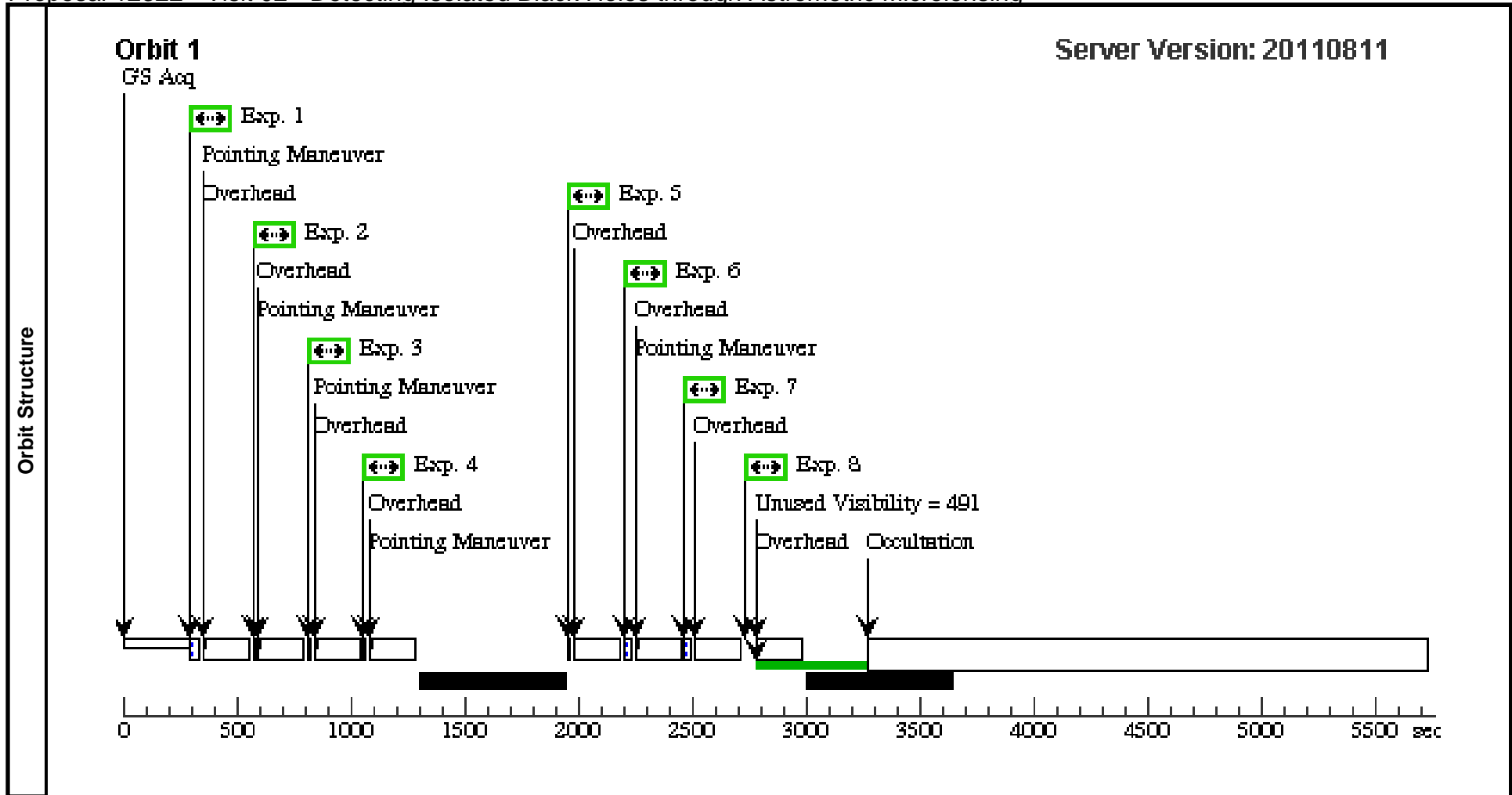
Fixed Targets	Visit									
	Proposal 12322, Visit 01, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 90D TO 90 D; BETWEEN 10-OCT-2010:00:00:00 AND 03-NOV-2010:00:00:00									
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous					
(9)	MOA-2010-BLG-482	RA: 17 59 47.9000 (269.9495833d) Dec: -27 00 29.00 (-27.00806d) Equinox: J2000		V=21.18+/-1.5	Reference Frame: ICRS					
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(9) MOA-2010-BLG-482	(9) MOA-2010-BLG-482	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG -39.9,-2.79		280 Secs [==>]	[1]
	2	(9) MOA-2010-BLG-482	(9) MOA-2010-BLG-482	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG -23.94,-1.67		280 Secs [==>]	[1]
	3	(9) MOA-2010-BLG-482	(9) MOA-2010-BLG-482	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG -7.98,-0.56		280 Secs [==>]	[1]
	4	(9) MOA-2010-BLG-482	(9) MOA-2010-BLG-482	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 7.98,0.56		280 Secs [==>]	[1]
	5	(9) MOA-2010-BLG-482	(9) MOA-2010-BLG-482	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 23.94,1.67		280 Secs [==>]	[1]
	6	(9) MOA-2010-BLG-482	(9) MOA-2010-BLG-482	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F606W	CR-SPLIT=NO	SAME POS AS 5		300 Secs [==>]	[1]



Proposal 12322 - Visit 02 - Detecting Isolated Black Holes through Astrometric Microlensing

Thu Oct 13 01:03:25 GMT 2011

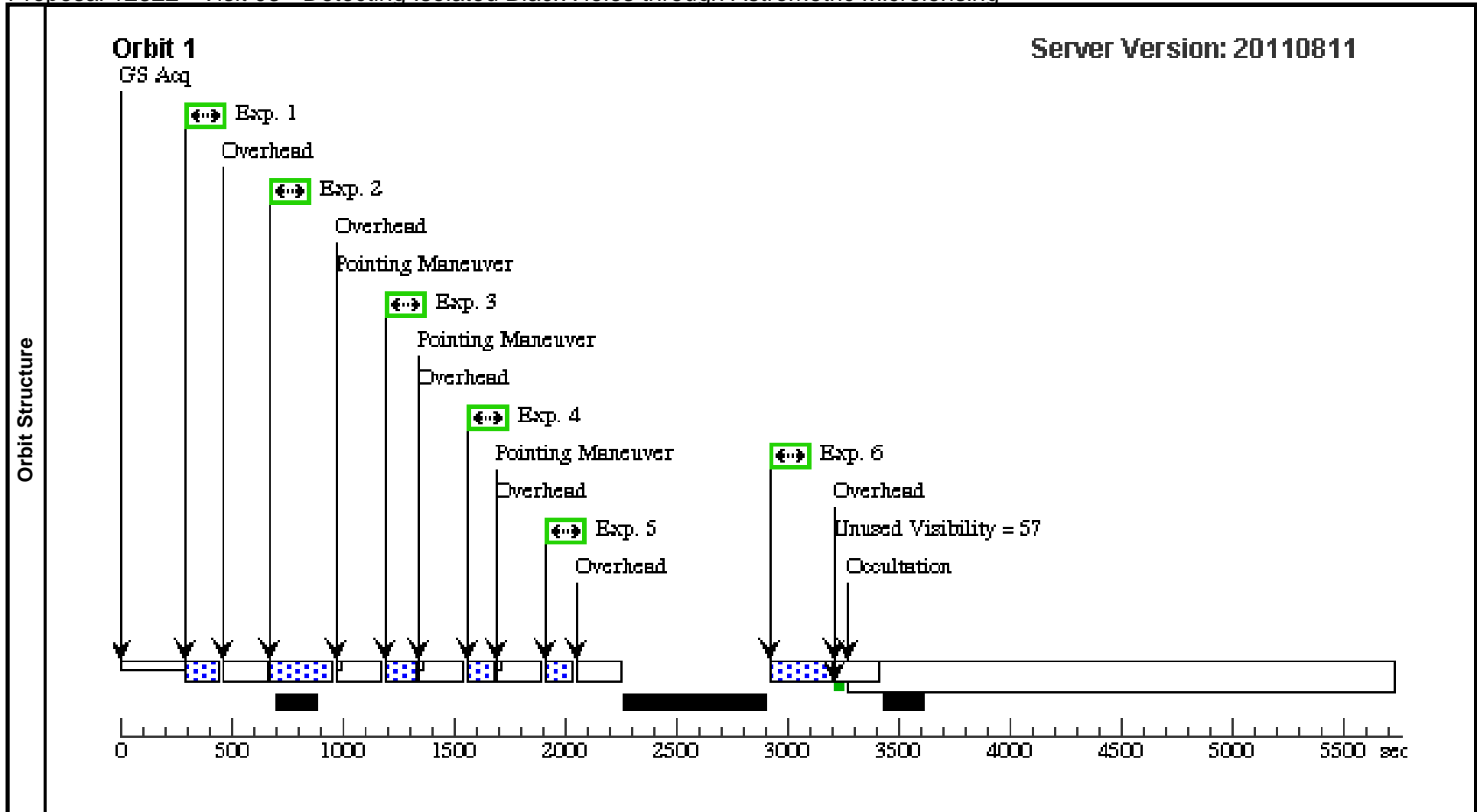
Fixed Targets	Visit									
	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(10)	MOA-2010-BLG-364	RA: 17 57 5.4000 (269.2725000d) Dec: -34 27 5.00 (-34.45139d) Equinox: J2000		V=16.75+/-1.5	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 23.94,1.67; GS ACQ SCENARI O BASE1B3		12 Secs [==>]	[1]
	2		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 27.13,1.89		12 Secs [==>]	[1]
	3		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 30.32,2.12		12 Secs [==>]	[1]
	4		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 33.52,2.34		12 Secs [==>]	[1]
	5		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 36.71,2.57		12 Secs [==>]	[1]
	6		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F606W	CR-SPLIT=NO	SAME POS AS 5		12 Secs [==>]	[1]
	7		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 40.41,3.29		12 Secs [==>]	[1]
	8		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F606W	CR-SPLIT=NO	SAME POS AS 7		12 Secs [==>]	[1]



Proposal 12322 - Visit 03 - Detecting Isolated Black Holes through Astrometric Microlensing

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Fixed Targets	Visit									
	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(10)	MOA-2010-BLG-364	RA: 17 57 5.4000 (269.2725000d) Dec: -34 27 5.00 (-34.45139d) Equinox: J2000		V=16.75+/-1.5	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG -39.90,-2.79		120 Secs [==>]	[1]
	2		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F606W	CR-SPLIT=NO	SAME POS AS 1		260 Secs [==>]	[1]
	3		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG -13.30,-0.93		120 Secs [==>]	[1]
	4		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 13.30,0.93		120 Secs [==>]	[1]
	5		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 39.90,2.79		120 Secs [==>]	[1]
	6		(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F606W	CR-SPLIT=NO	SAME POS AS 5		260 Secs [==>]	[1]



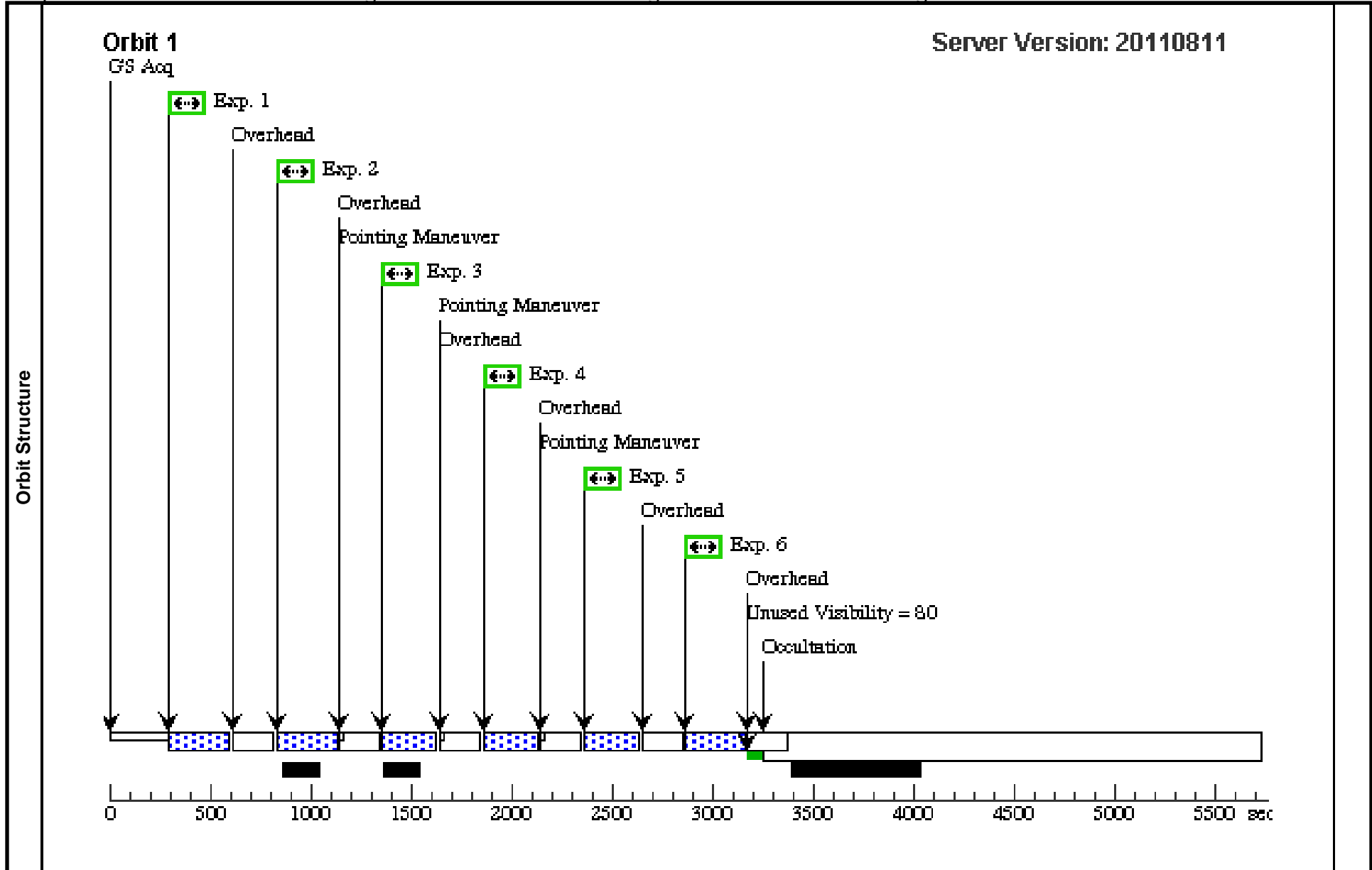
Proposal 12322 - Visit 04 - Detecting Isolated Black Holes through Astrometric Microlensing

Thu Oct 13 01:03:27 GMT 2011

Fixed Targets	Visit				
	Proposal 12322, Visit 04, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 270D TO 270 D; BETWEEN 10-APR-2011:00:00:00 AND 20-APR-2011:00:00:00				
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	MOA-2009-BLG-260	RA: 17 58 28.5700 (269.6190417d) Dec: -26 50 21.09 (-26.83919d) Equinox: J2000		V=16.61+/-1.5	Reference Frame: ICRS

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F606W	CR-SPLIT=NO	POS TARG -23.94,-1.67		275 Secs [==>]	[1]
	2		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	SAME POS AS 1		275 Secs [==>]	[1]
	3		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG -7.98,-0.56		275 Secs [==>]	[1]
	4		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 7.98,0.56		275 Secs [==>]	[1]
	5		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F814W	CR-SPLIT=NO	POS TARG 23.94,1.67		275 Secs [==>]	[1]
	6		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS1-2K4-SUB	F606W	CR-SPLIT=NO	SAME POS AS 5		275 Secs [==>]	[1]



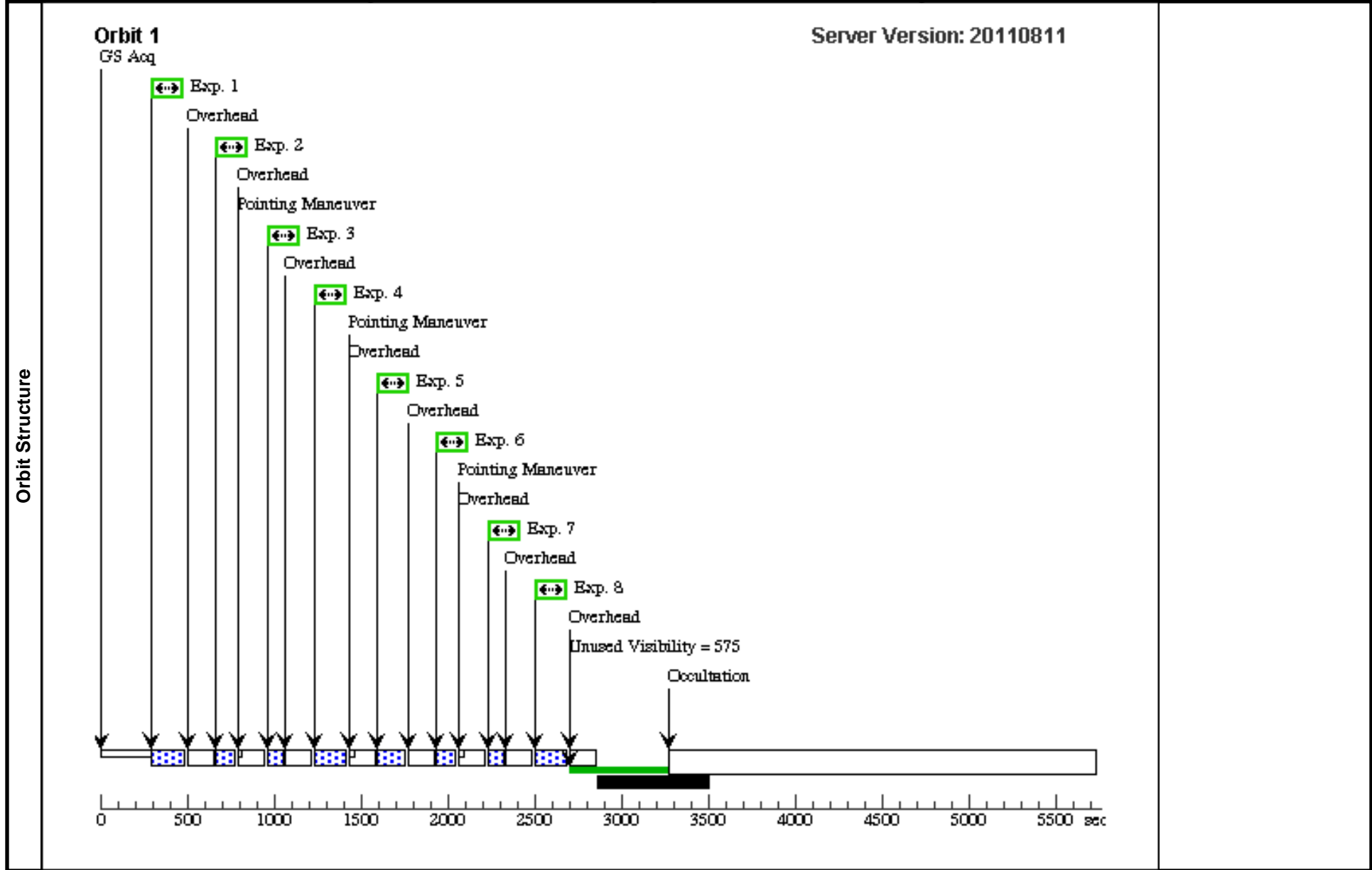
Proposal 12322 - Visit 05 - Detecting Isolated Black Holes through Astrometric Microlensing

Thu Oct 13 01:03:28 GMT 2011

Fixed Targets	Visit				
	Proposal 12322, Visit 05, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 10-JUL-2011:00:00:00 AND 25-JUL-2011:00:00:00				
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	MOA-2010-BLG-364	RA: 17 57 5.4000 (269.2725000d) Dec: -34 27 5.00 (-34.45139d) Equinox: J2000		V=16.75+/-1.5	Reference Frame: ICRS

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(10) MOA-2010-BL G-364	(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	GS ACQ SCENARI O BASE1B3		160 Secs [==>]	[1]
	2	(10) MOA-2010-BL G-364	(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO			90 Secs [==>]	[1]
	3	(10) MOA-2010-BL G-364	(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	POS TARG 13.87,8.01		90 Secs [==>]	[1]
	4	(10) MOA-2010-BL G-364	(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	SAME POS AS 3		160 Secs [==>]	[1]
	5	(10) MOA-2010-BL G-364	(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	POS TARG -13.87,8.01		160 Secs [==>]	[1]
	6	(10) MOA-2010-BL G-364	(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	SAME POS AS 5		90 Secs [==>]	[1]
	7	(10) MOA-2010-BL G-364	(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	POS TARG 0,-16.02		90 Secs [==>]	[1]
	8	(10) MOA-2010-BL G-364	(10) MOA-2010-BL G-364	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	SAME POS AS 7		160 Secs [==>]	[1]



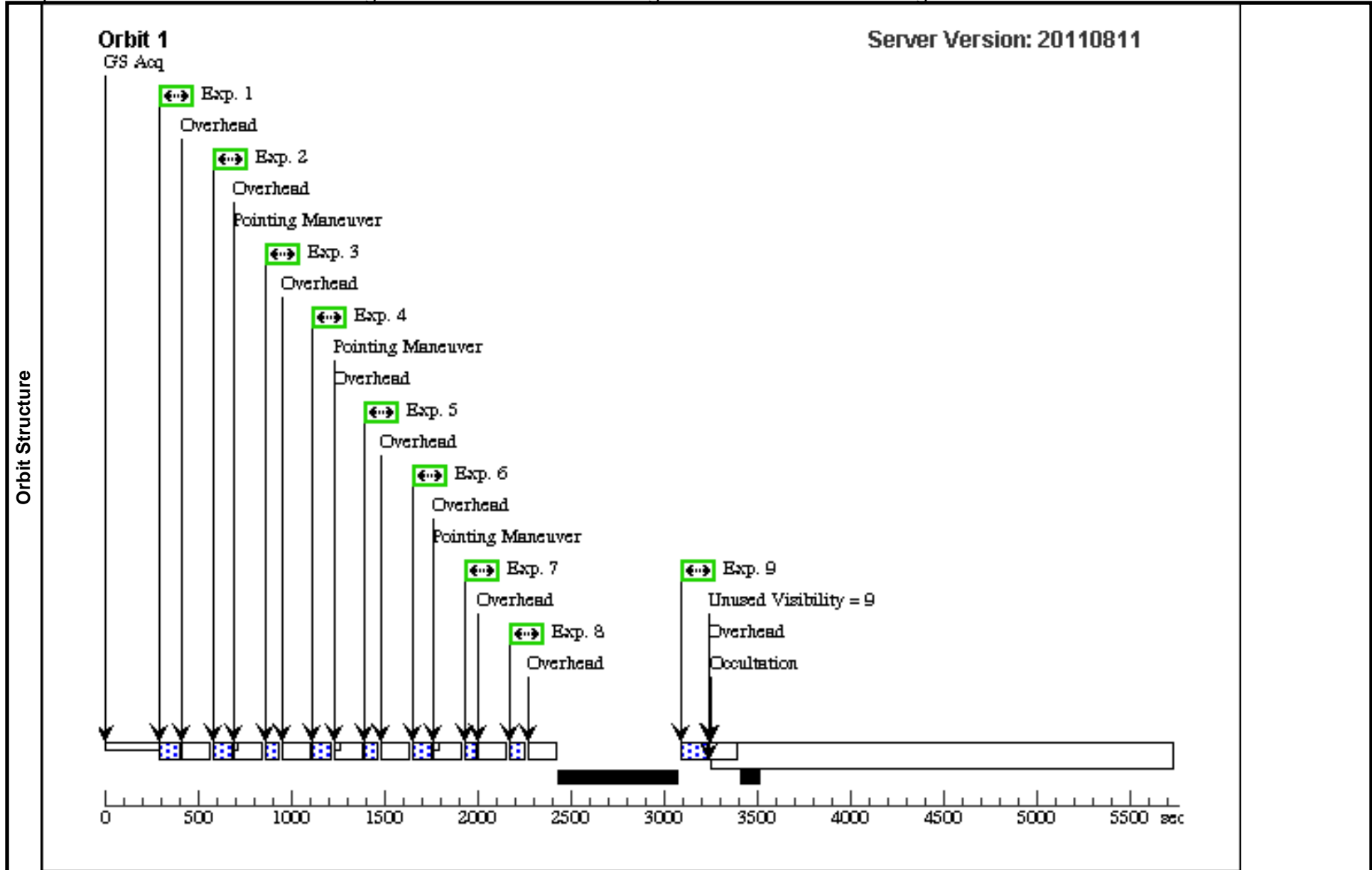
Proposal 12322 - Visit 06 - Detecting Isolated Black Holes through Astrometric Microlensing

Thu Oct 13 01:03:28 GMT 2011

Fixed Targets	Visit				
	Proposal 12322, Visit 06, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 90.0D TO 90.0 D; BETWEEN 07-AUG-2011:00:00:00 AND 10-AUG-2011:00:00:00				
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(11)	OGLE-2011-BLG-462	RA: 17 51 40.1900 (267.9174583d) Dec: -29 53 26.30 (-29.89064d) Equinox: J2000		V=20.25+/-0.1	Reference Frame: ICRS

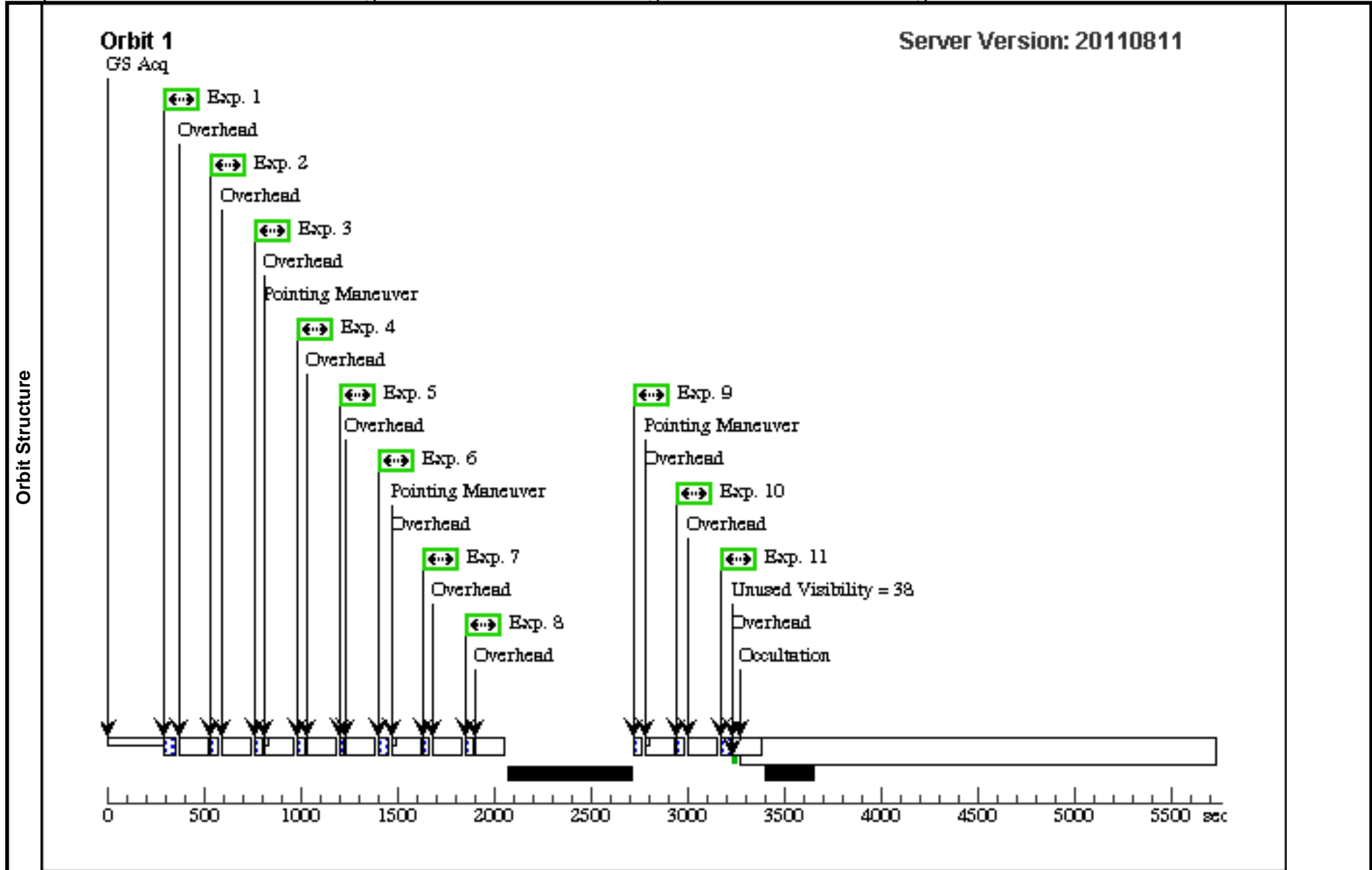
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(11) OGLE-2011-BL G-462	(11) OGLE-2011-BL G-462	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	GS ACQ SCENARI O BASE1B3		75 Secs [==>]	[1]
	2	(11) OGLE-2011-BL G-462	(11) OGLE-2011-BL G-462	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO			75 Secs [==>]	[1]
	3	(11) OGLE-2011-BL G-462	(11) OGLE-2011-BL G-462	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	POS TARG 13.87,8.01		75 Secs [==>]	[1]
	4	(11) OGLE-2011-BL G-462	(11) OGLE-2011-BL G-462	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	SAME POS AS 3		75 Secs [==>]	[1]
	5	(11) OGLE-2011-BL G-462	(11) OGLE-2011-BL G-462	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	POS TARG -13.87,8.01		75 Secs [==>]	[1]
	6	(11) OGLE-2011-BL G-462	(11) OGLE-2011-BL G-462	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	SAME POS AS 5		75 Secs [==>]	[1]
	7	(11) OGLE-2011-BL G-462	(11) OGLE-2011-BL G-462	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	POS TARG 0,-16.02		60 Secs [==>]	[1]
	8	(11) OGLE-2011-BL G-462	(11) OGLE-2011-BL G-462	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	SAME POS AS 7		60 Secs [==>]	[1]
	9	(11) OGLE-2011-BL G-462	(11) OGLE-2011-BL G-462	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	SAME POS AS 7		120 Secs [==>]	[1]



Proposal 12322 - Visit 07 - Detecting Isolated Black Holes through Astrometric Microlensing

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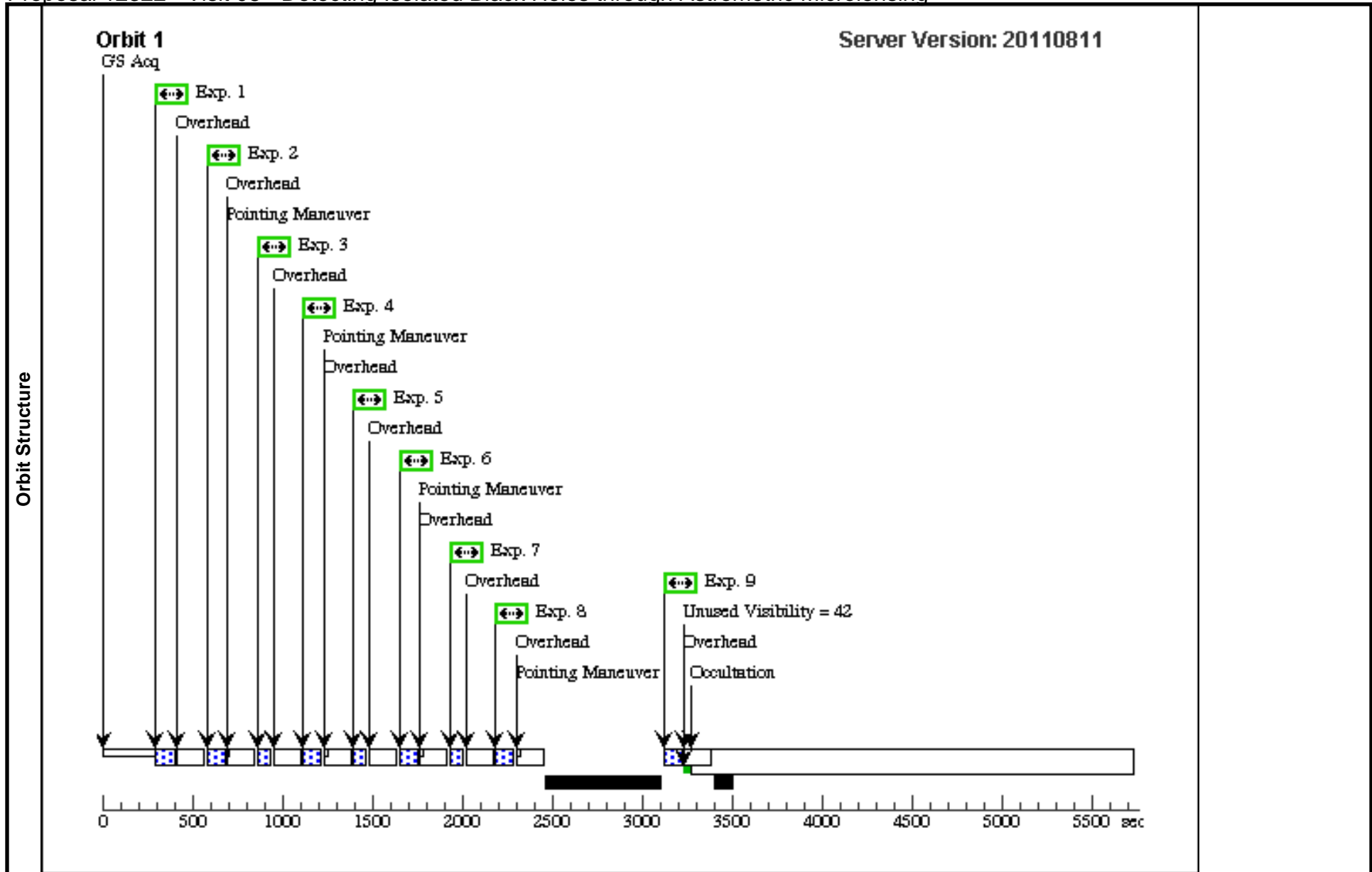
Visit	Proposal 12322, Visit 07, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: BEFORE 20-AUG-2011									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(12)	OGLE-2011-BLG-0037	RA: 17 55 55.8300 (268.9826250d) Dec: -30 33 39.70 (-30.56103d) Equinox: J2000		V=17.5	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W		POS TARG 9.36,8.2 2		30 Secs [==>]	[1]
	2	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		SAME POS AS 1		20 Secs [==>]	[1]
	3	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		SAME POS AS 1		40 Secs [==>]	[1]
	4	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		POS TARG 19.62,2. 29		40 Secs [==>]	[1]
	5	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		SAME POS AS 4		20 Secs [==>]	[1]
	6	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W		SAME POS AS 5		30 Secs [==>]	[1]
	7	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W		POS TARG 3.44,18. 48		30 Secs [==>]	[1]
	8	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		SAME POS AS 7		20 Secs [==>]	[1]
	9	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		SAME POS AS 7		40 Secs [==>]	[1]
	10	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		POS TARG 0.981,-0 .159		40 Secs [==>]	[1]
11	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W		POS TARG 0.981,-0 .159		30 Secs [==>]	[1]	



Proposal 12322 - Visit 08 - Detecting Isolated Black Holes through Astrometric Microlensing

Thu Oct 13 01:03:30 GMT 2011

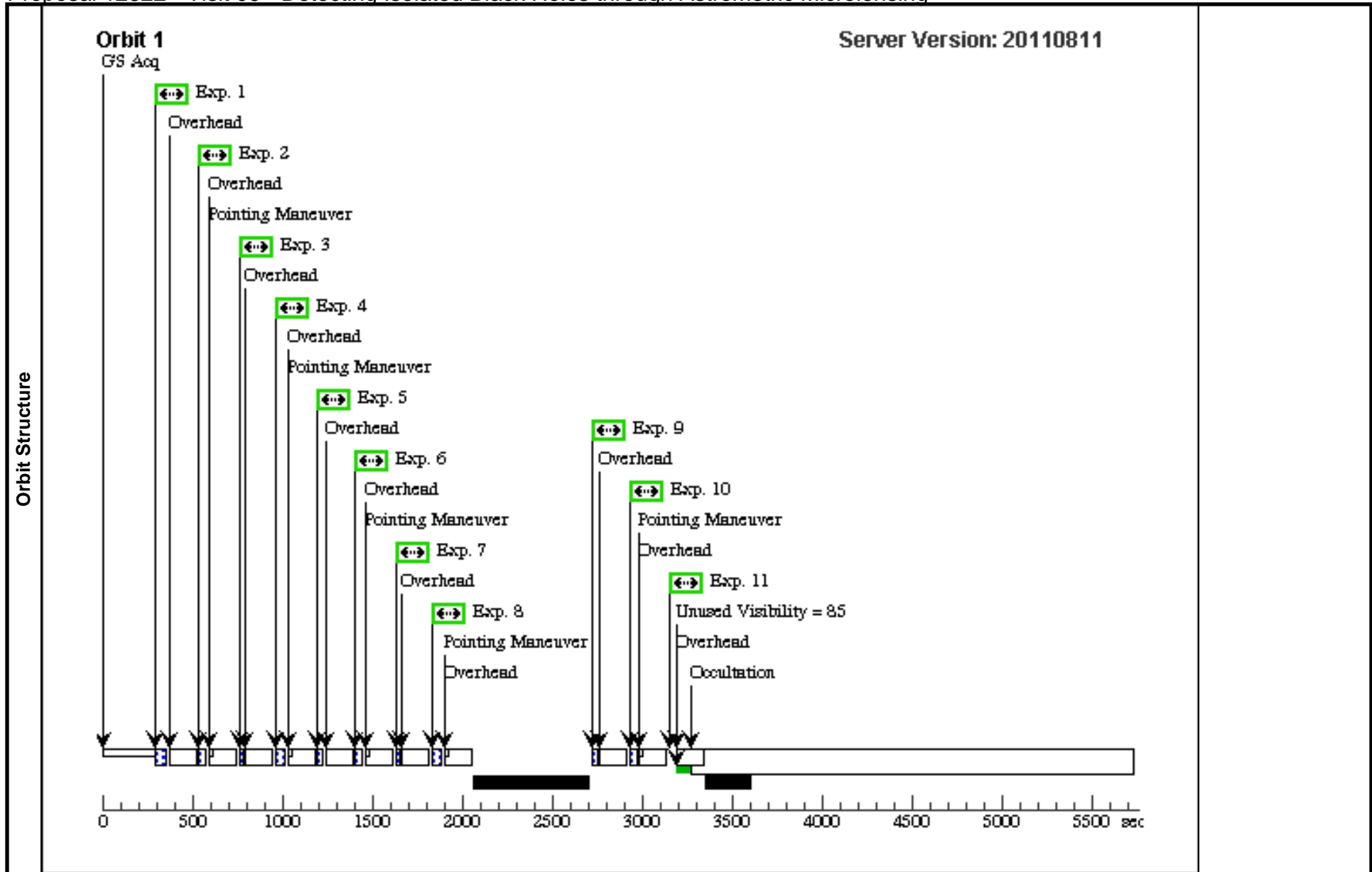
Visit	Proposal 12322, Visit 08, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 90.0D TO 90.0 D; BETWEEN 07-SEP-2011:00:00:00 AND 23-SEP-2011:00:00:00										
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(6)	OGLE-2011-BLG-310	RA: 17 51 25.3900 (267.8557917d) Dec: -30 24 35.00 (-30.40972d) Equinox: J2000			V=18	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit	
	1	(6) OGLE-2011-BL G-310	(6) OGLE-2011-BL G-310	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	POS TARG 10.4,9; GS ACQ SCENARI O BASE1B3		75 Secs [==>]	[1]	
	2	(6) OGLE-2011-BL G-310	(6) OGLE-2011-BL G-310	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	SAME POS AS 1		75 Secs [==>]	[1]	
	3	(6) OGLE-2011-BL G-310	(6) OGLE-2011-BL G-310	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	POS TARG 16.12,14 .72		75 Secs [==>]	[1]	
	4	(6) OGLE-2011-BL G-310	(6) OGLE-2011-BL G-310	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	SAME POS AS 3		75 Secs [==>]	[1]	
	5	(6) OGLE-2011-BL G-310	(6) OGLE-2011-BL G-310	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	POS TARG 4.68,14. 72		75 Secs [==>]	[1]	
	6	(6) OGLE-2011-BL G-310	(6) OGLE-2011-BL G-310	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	SAME POS AS 5		75 Secs [==>]	[1]	
	7	(6) OGLE-2011-BL G-310	(6) OGLE-2011-BL G-310	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	POS TARG 4.68,3.2 8		75 Secs [==>]	[1]	
	8	(6) OGLE-2011-BL G-310	(6) OGLE-2011-BL G-310	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	SAME POS AS 7		75 Secs [==>]	[1]	
	9	(6) OGLE-2011-BL G-310	(6) OGLE-2011-BL G-310	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	POS TARG 16.12,3. 28		75 Secs [==>]	[1]	



Proposal 12322 - Visit 09 - Detecting Isolated Black Holes through Astrometric Microlensing

Thu Oct 13 01:03:31 GMT 2011

Visit	Proposal 12322, Visit 09, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 25-SEP-2011 AND 28-SEP-2011									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(12)	OGLE-2011-BLG-0037	RA: 17 55 55.8300 (268.9826250d) Dec: -30 33 39.70 (-30.56103d) Equinox: J2000		V=17.5	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W		POS TARG 10.4,9.0		30 Secs [==>]	[1]
	2	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		SAME POS AS 1		20 Secs [==>]	[1]
	3	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		POS TARG 22.25,9.0		20 Secs [==>]	[1]
	4	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W		SAME POS AS 3		30 Secs [==>]	[1]
	5	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W		POS TARG 16.31,19.27		30 Secs [==>]	[1]
	6	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		SAME POS AS 5		20 Secs [==>]	[1]
	7	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		POS TARG 4.45,19.25		20 Secs [==>]	[1]
	8	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W		SAME POS AS 7		30 Secs [==>]	[1]
	9	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W		POS TARG -1.45,8.95		30 Secs [==>]	[1]
	10	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		SAME POS AS 9		20 Secs [==>]	[1]
11	(12) OGLE-2011-BL G-0037	(12) OGLE-2011-BL G-0037	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W		POS TARG 4.53,-1.30		20 Secs [==>]	[1]	



Proposal 12322 - Visit 10 - Detecting Isolated Black Holes through Astrometric Microlensing

Thu Oct 13 01:03:32 GMT 2011

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(7)	MOA-2009-BLG-260	RA: 17 58 28.5700 (269.6190417d) Dec: -26 50 21.09 (-26.83919d) Equinox: J2000			V=16.61+/-1.5

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	POS TARG 22.25,9; GS ACQ SCENARI O BASE1B3		275 Secs [==>]	[1]
	2		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	SAME POS AS 1		275 Secs [==>]	[1]
	3		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	POS TARG 10.37,20 .85		275 Secs [==>]	[1]
	4		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	POS TARG -1.45,8. 95		275 Secs [==>]	[1]
	5		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	CR-SPLIT=NO	POS TARG 10.48,-2 .85		275 Secs [==>]	[1]
	6		(7) MOA-2009-BLG-260	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=NO	SAME POS AS 5		275 Secs [==>]	[1]

