12540 - UV Studies of a Core Collapse Supernova

Cycle: 19, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Prof. Robert P. Kirshner (PI)	**Harvard University**	**kirshner@cfa.harvard.edu**
Dr. Stephane Blondin (CoI) (ESA Member)	CPPM, Centre de Physique des Particules de Marseille	blondin@cppm.in2p3.fr
Mr. Peter Challis (CoI)	Australian National University	pchallis@mso.anu.edu.au
Dr. Roger A. Chevalier (CoI)	The University of Virginia	rac5x@virginia.edu
Dr. Bruno Leibundgut (CoI) (ESA Member)	European Southern Observatory - Germany	bleibund@eso.org
Prof. Claes Fransson (CoI) (ESA Member)	Stockholm University	fransson@astro.su.se
Prof. Alicia M. Soderberg (CoI)	Harvard University	asoderberg@cfa.harvard.edu
Dr. Jesper Sollerman (CoI) (ESA Member)	Stockholm University	jesper@astro.su.se
Dr. Nathan Smith (CoI)	University of Arizona	nathans@as.arizona.edu
Dr. Ryan Chornock (CoI)	Harvard University	rchornock@cfa.harvard.edu
Dr. Ryan Foley (CoI)	Smithsonian Institution Astrophysical Observatory	rfoley@cfa.harvard.edu
Dr. Kevin France (CoI)	University of Colorado at Boulder	kevin.france@colorado.edu
Dr. G. H. Marion (CoI)	Harvard University	gmarion@cfa.harvard.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(4) SN2011DH CCDFLAT	STIS/CCD	2	09-May-2012 22:26:50.0	yes
02	(4) SN2011DH	STIS/CCD STIS/NUV-MAMA	2	09-May-2012 22:27:03.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
20	(3) SN2010JL	STIS/CCD STIS/NUV-MAMA	2	09-May-2012 22:27:16.0	yes
22	(3) SN2010JL	COS/FUV COS/NUV	3	09-May-2012 22:27:24.0	yes
23	(3) SN2010JL	COS/FUV COS/NUV	3	09-May-2012 22:27:33.0	yes

12 Total Orbits Used

ABSTRACT

The UV spectrum of a core collapse SN encodes unique information about nucleosynthesis, the star's mass loss history, shock physics, and dust formation. This proposal aims at a detailed study of one bright core collapse SN, discoved as a result of the many ongoing surveys, either a Type IIP, IIn or Ib or Ic supernova. We will address the role of circumstellar interaction and mass loss through CNO lines in the UV, the nature of dust formation from UV line profiles, and we will use the UV continuum as a diagnostic of non-thermal emission from the shock. The overall goal is to achieve a better understanding of these objects by combining ground-based observations with complementary HST data. In cycle 17 and cycle 18 we obtained excellent data for SN 2010al and SN 2010jl that live up to our expectations. In the past, we have used HST to obtain critical UV spectra from the explosion to the nebular phase with good results for a limited number of objects. The advent of COS provides new capability for UV observations which we would like to exploit. When nature provides a bright candidate, HST should be ready to respond.

OBSERVING DESCRIPTION

first visit will be just STIS/CCD

second visit STISCCD+COS, 20-40 days after first visit

thrid visit STIS/CCD+COS, 60=80 days after first visit

Visit

Proposal 12540, Visit 01, completed Thu May 10 02:27:40 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: BETWEEN 10-JUN-2011:00:00:00 AND 30-JUN-2011:00:00:00

Comments: ToO
Acquisition time is correct for sn2011dh @ mag 14.0

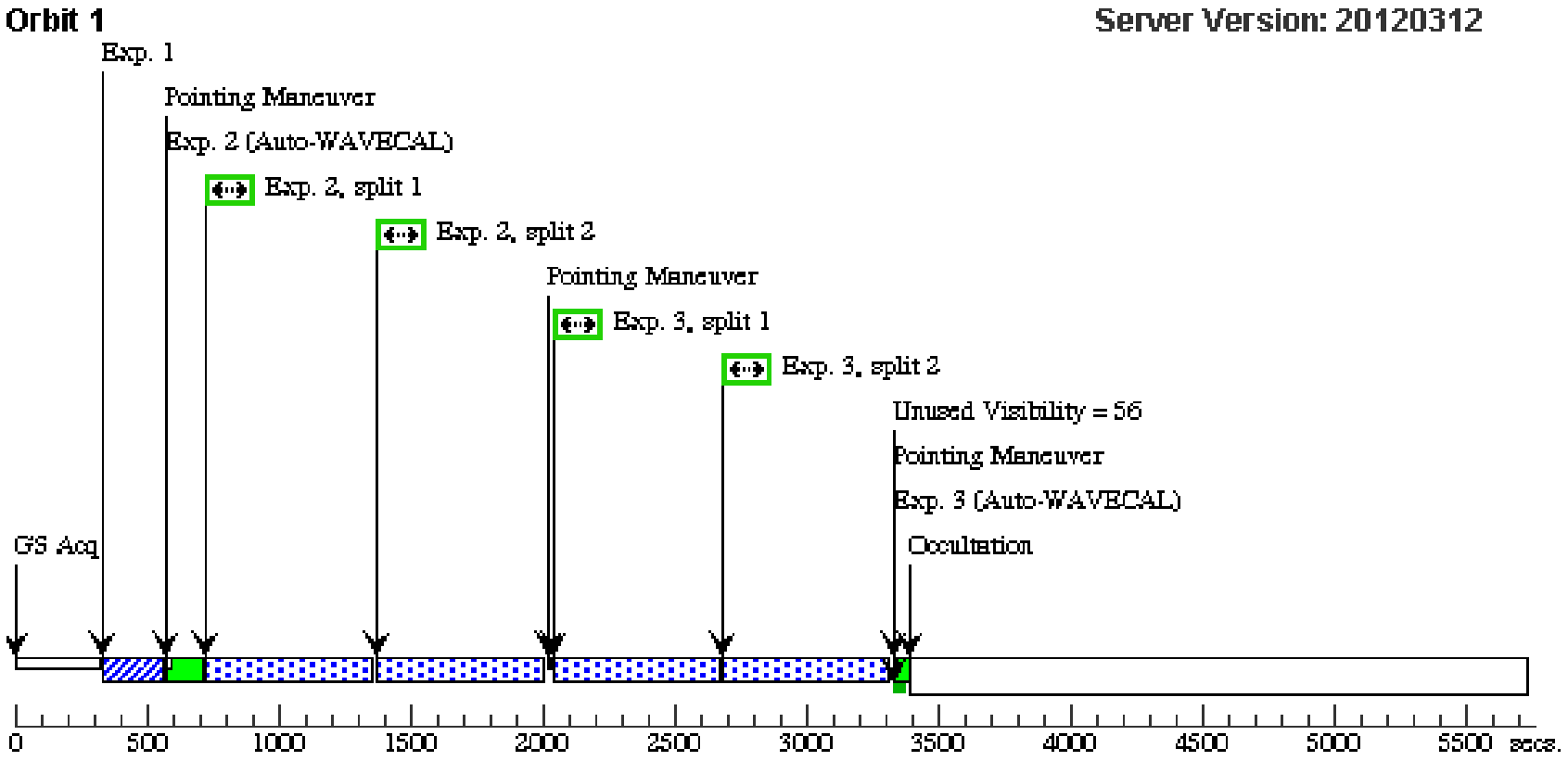
Fixed Targets

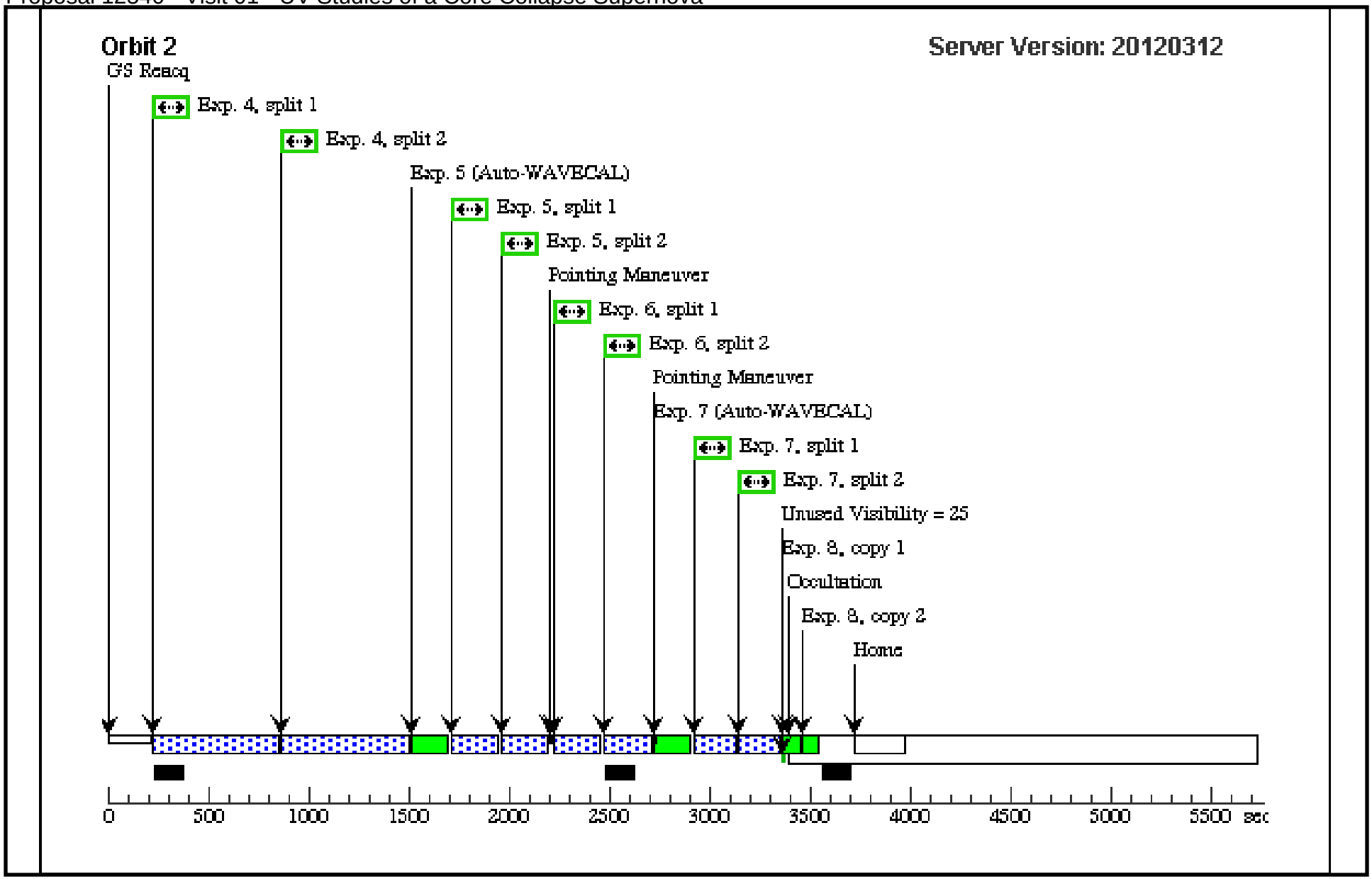
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SN2011DH	RA: 13 30 5.1240 (202.5213500d) Dec: +47 10 11.30 (47.16981d) Equinox: J2000		V=14.0	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(4) SN2011DH	STIS/CCD, ACQ, F28X50LP	MIRROR		GS ACQ SCENARIO BASE1B3		0.2 Secs *[==>]*	***[1]***
Comments: Acq for supernova v=14.0									
2		(4) SN2011DH	STIS/CCD, ACCUM, 52X0.2E1	G230LB 2375 A	CR-SPLIT=2			1200 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
3		(4) SN2011DH	STIS/CCD, ACCUM, 52X0.2E1	G230LB 2375 A	CR-SPLIT=2	POS TARG 0,0.5		1200 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
4		(4) SN2011DH	STIS/CCD, ACCUM, 52X0.2E1	G230LB 2375 A	CR-SPLIT=2	POS TARG 0,1.0		1200 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[2]***
5		(4) SN2011DH	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A	CR-SPLIT=2	POS TARG 0,1.0		400 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[2]***
6		(4) SN2011DH	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A	CR-SPLIT=2	POS TARG 0,0.5		400 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[2]***
7		(4) SN2011DH	STIS/CCD, ACCUM, 52X0.2E2	G750L 7751 A	CR-SPLIT=2	POS TARG null,0.5		350 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[2]***
8		CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				*[==>(Copy 1)]* *[==>(Copy 2)]*	***[2]***

Orbit Structure

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GS Reacq
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Exp. 4, split 2
Exp. 5 (Auto-WAVECAL)
Exp. 5, split 1
Exp. 5, split 2
Pointing Maneuver
Exp. 6, split 1
Exp. 6, split 2
Pointing Maneuver
Exp. 7 (Auto-WAVECAL)
Exp. 7, split 1
Exp. 7, split 2
Unused Visibility = 25
Exp. 8, copy 1
Occultation
Exp. 8, copy 2
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12540, Visit 02, completed Thu May 10 02:27:42 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/NUV-MAMA

Special Requirements: BETWEEN 01-FEB-2012:00:00:00 AND 30-APR-2012:00:00:00

Comments: Visit 2 will provide the UV spectrum of sn2011dh. Then we can measure the flux in the UV to caclulate the proper exposures times for the acqusition in visit 3.

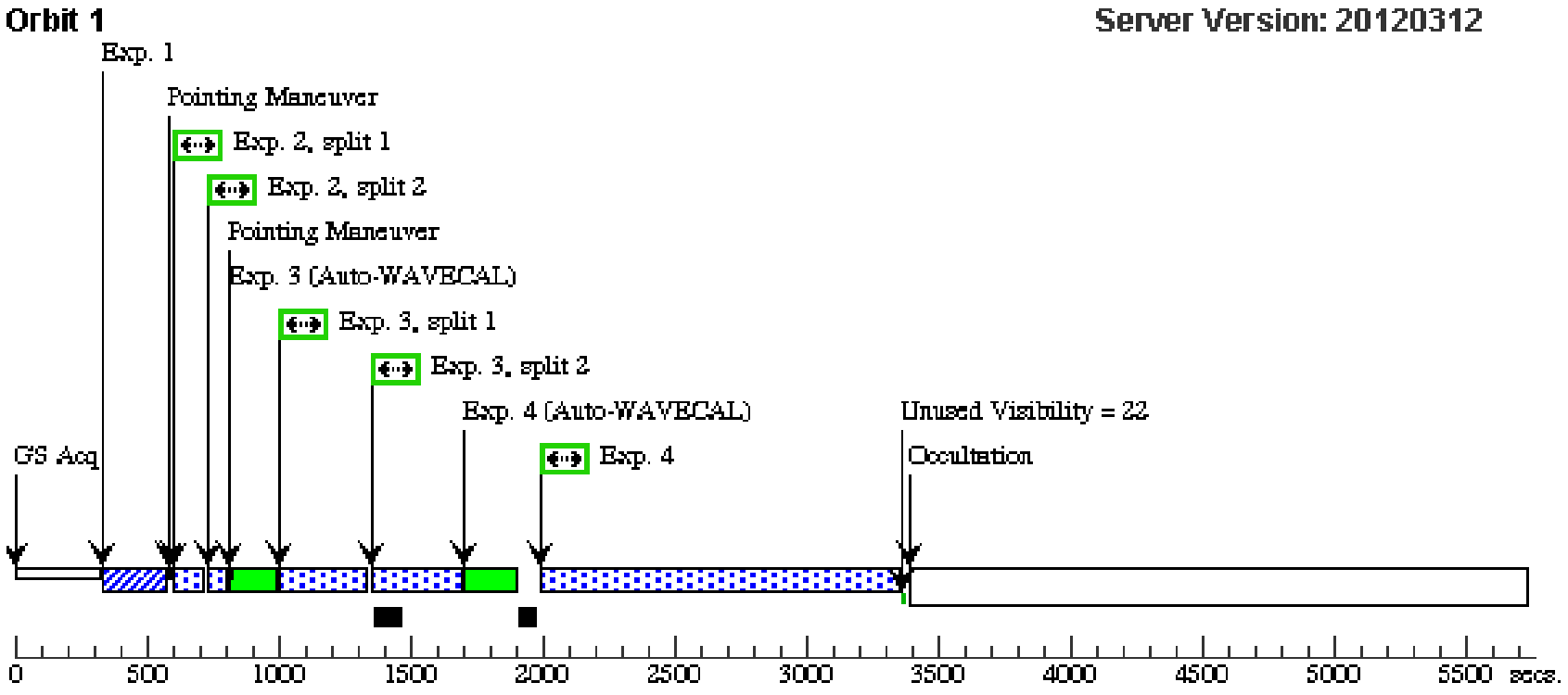
Fixed Targets

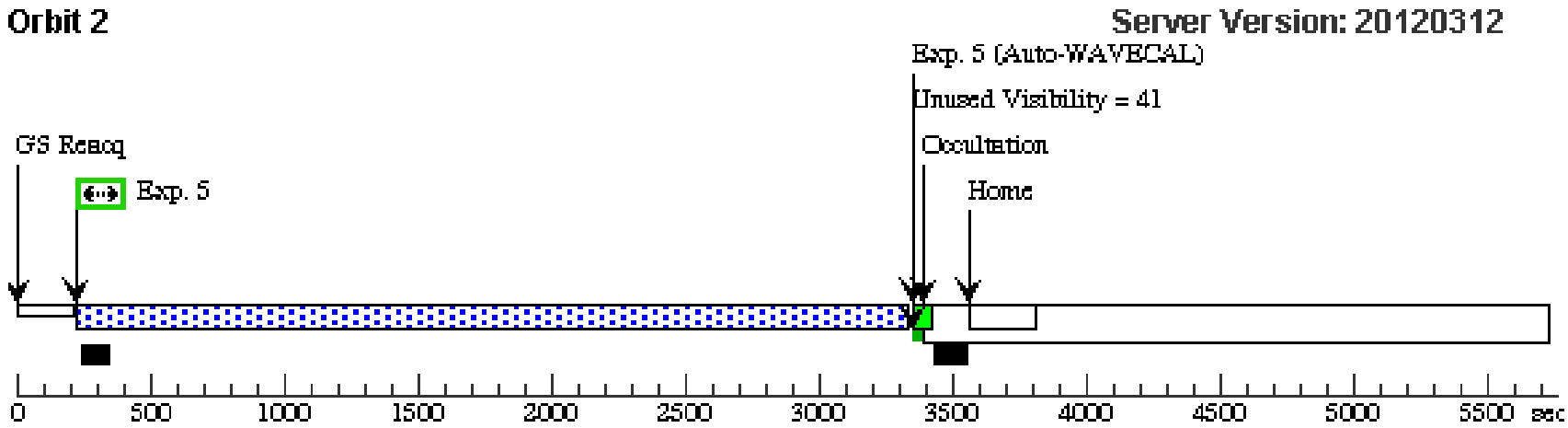
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SN2011DH	RA: 13 30 5.1240 (202.5213500d) Dec: +47 10 11.30 (47.16981d) Equinox: J2000		V=14.0	Reference Frame: ICRS

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	(STIS.ta.357348)	(4) SN2011DH	STIS/CCD, ACQ, F28X50LP	MIRROR				3 Secs *[==>]*	***[1]***
Comments: Acq for supernova v=18.0									
2		(4) SN2011DH	STIS/CCD, ACCUM, F28X50LP	MIRROR	CR-SPLIT=2			60 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
3		(4) SN2011DH	STIS/CCD, ACCUM, 52X0.2	G430L 4300 A	CR-SPLIT=2			600 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
4	(STIS.sp.357436)	(4) SN2011DH	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				1350 Secs *[==>]*	***[1]***
Comments: STIS.sp.357436 93J-nuv STIS.sp.357438 98S-nuv									
5	(STIS.sp.357436)	(4) SN2011DH	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				3100 Secs *[==>]*	***[2]***
Comments: STIS.sp.357436 93J-nuv STIS.sp.357438 98S-nuv									

Orbit Structure





Proposal 12540 - Visit 20 - UV Studies of a Core Collapse Supernova

Visit

Proposal 12540, Visit 20, completed Thu May 10 02:27:43 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/NUV-MAMA

Special Requirements: BETWEEN 01-JAN-2012:00:00:00 AND 31-MAY-2012:00:00:00

Comments: Visit 20 will provide the UV spectrum of sn2010jl.
on Jan 25, 2012 the brightness of the supernova was B 16.8
The supernova is declining @ 0.012 mags/day

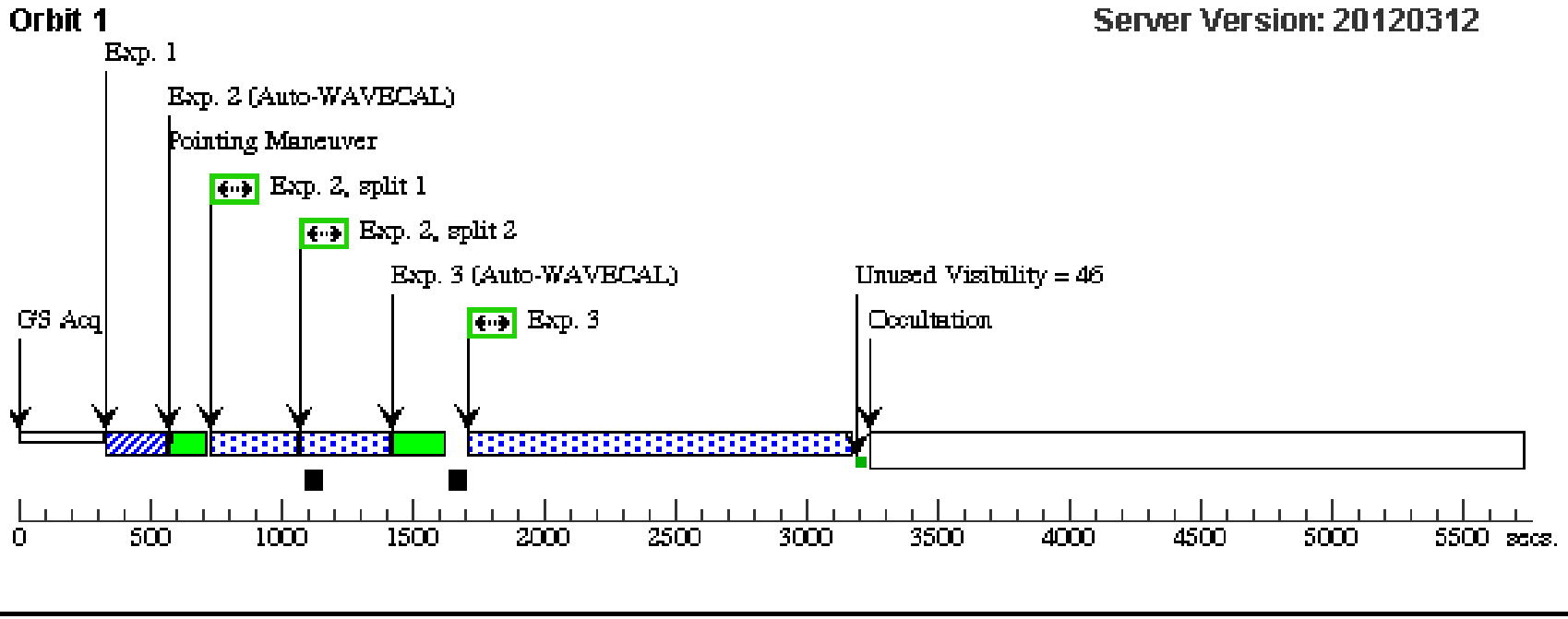
Fixed Targets

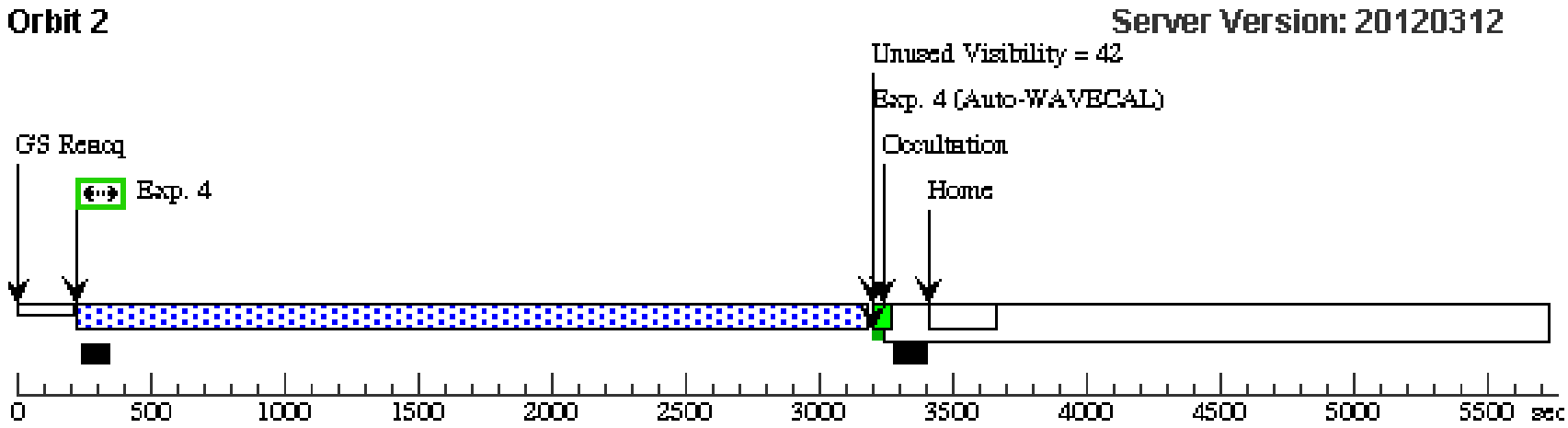
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	SN2010JL	RA: 09 42 53.3300 (145.7222083d) Dec: +09 29 42.10 (9.49503d) Equinox: J2000		V=13.0	Reference Frame: ICRS

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	(STIS.ta.352068)	(3) SN2010JL	STIS/CCD, ACQ, F28X50LP	MIRROR		GS ACQ SCENARIO BASE1B3		1 Secs *[==>]*	 ***[1]***
Comments: an exposure time of 1 second will work find for B mag of 17.5 we expect the brightness to be about 17.5 on March 1, 2012 decling at 0.012 mags/day									
2		(3) SN2010JL	STIS/CCD, ACCUM, 52X0.2	G430L 4300 A	CR-SPLIT=2			600 Secs *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***
3	(STIS.sp.352069)	(3) SN2010JL	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				1450 Secs *[==>]*	 ***[1]***
4	(STIS.sp.352070)	(3) SN2010JL	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				2950 Secs *[==>]*	 ***[2]***

Orbit Structure





Visit

Proposal 12540, Visit 22 Thu May 10 02:27:44 GMT 2012

Diagnostic Status: Warning

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: AFTER 20 BY 20 D TO 60 D; SEQ 22,23 WITHIN 3 D

Comments: The STS observation on May 5, 2012 is shown here:
COS.ta.401074

MIRROR B = 314 seconds, I put 350 as the supernova is slowly fading
please try to schedule visits 22 and 23 in the same SMS.
a couple days different is not critical.

Diagnostics

(Visit 22) Warning (Form): For the best data quality, it is strongly recommended that all four FP-POS positions be used when observing at a given COS CENWAVE setting.

(Visit 22) Warning (Form): If the target coordinates are not known to 0.4" (or better) an ACQ/SEARCH should precede the ACQ/IMAGE.

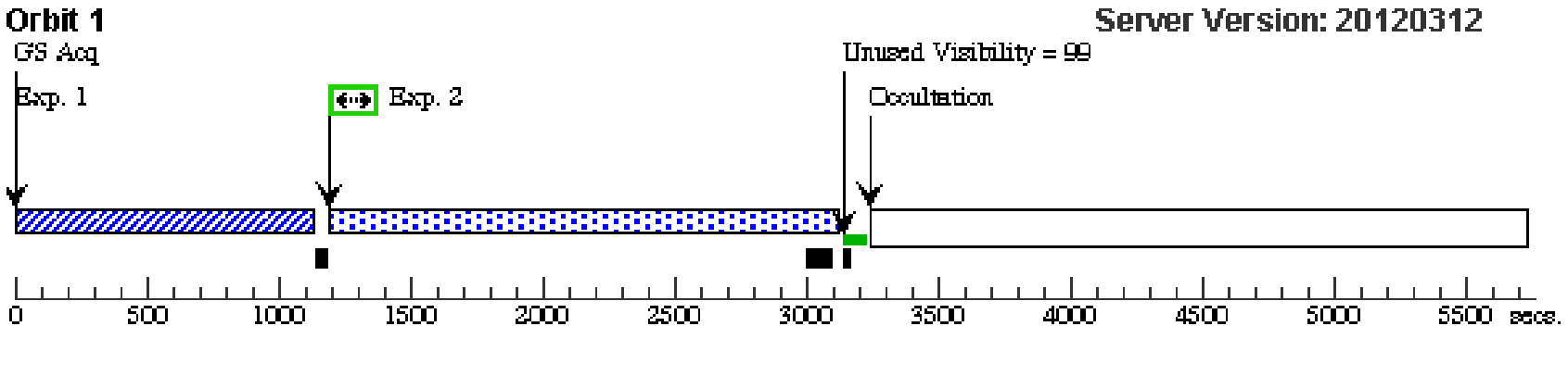
Fixed Targets

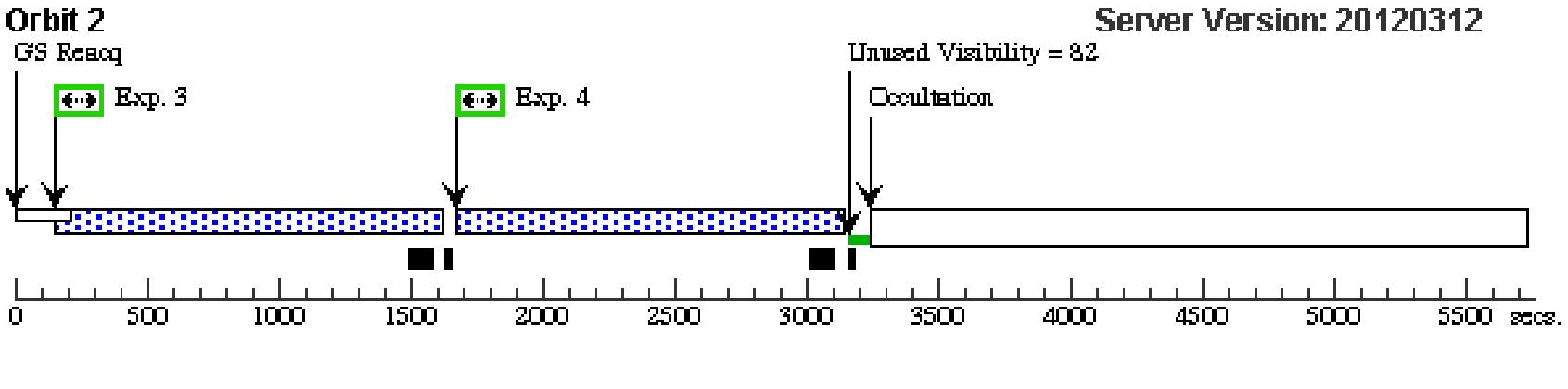
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	SN2010JL	RA: 09 42 53.3300 (145.7222083d) Dec: +09 29 42.10 (9.49503d) Equinox: J2000		V=13.0	Reference Frame: ICRS

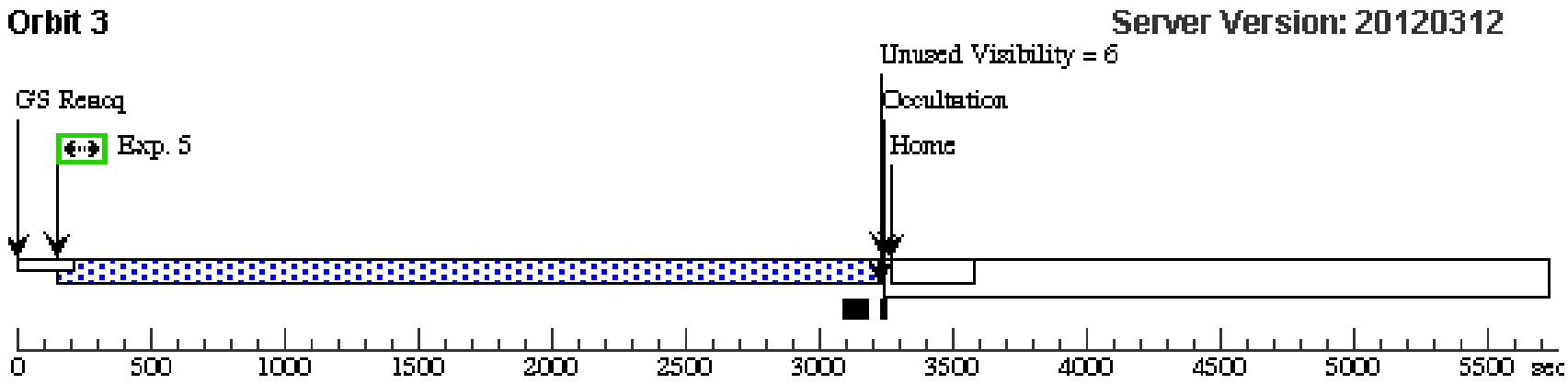
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	(COS.ta.401074)	(3) SN2010JL	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				350 Secs *[==>]*	*[1]*
	Comments: we will haev to update the acq time after getting the data in visit 20 *new light curve shows an estimated mag of B = 16.8 for May 15, 2012* *MIRROR B with 132 seconds yields a s/n = 40* *We observed sn2010jl with COS on 2011-01-23. by far the brightest feature in the spectrum is the sky Lyman- alpha. the spectrum can be viewed here. https://www.cfa.harvard.edu/~pchallis/sn2010jl_cos.ps* *a STIS image of the SN + host is here.. there is nothing nearby that is bright. https://www.cfa.harvard.edu/~pchallis/sn2010jl_pic.jpg https://www.cfa.harvard.edu/~pchallis/sn2010jl_pic.jpg*								
2	(COS.sp.352071)	(3) SN2010JL	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1640; FP-POS=1			1750 Secs *[==>]*	*[1]*
3	(COS.sp.352071)	(3) SN2010JL	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=1240; FP-POS=2			1350 Secs *[==>]*	*[2]*
4	(COS.sp.352071)	(3) SN2010JL	COS/FUV, TIME-TAG, PSA	G130M 1309 A	BUFFER-TIME=1240; FP-POS=3			1350 Secs *[==>]*	*[2]*
5	(COS.sp.352071)	(3) SN2010JL	COS/FUV, TIME-TAG, PSA	G130M 1318 A	BUFFER-TIME=2840; FP-POS=4			2950 Secs *[==>]*	*[3]*

Orbit Structure







Visit

Proposal 12540, Visit 23 Thu May 10 02:27:45 GMT 2012

Diagnostic Status: Warning

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: AFTER 20 BY 20 D TO 60 D

Comments: The STS observation on May 5, 2012 is shown here:
COS.ta.401074

MIRROR B = 314 seconds, I put 350 as the supernova is slowly fading
please try to schedule visits 22 and 23 in the same SMS.
a couple days different is not critical.

Diagnostics

(Visit 23) Warning (Form): If the target coordinates are not known to 0.4" (or better) an ACQ/SEARCH should precede the ACQ/IMAGE.

(Visit 23) Warning (Form): For the best data quality, it is strongly recommended that all four FP-POS positions be used when observing at a given COS CENWAVE setting.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	SN2010JL	RA: 09 42 53.3300 (145.7222083d) Dec: +09 29 42.10 (9.49503d) Equinox: J2000		V=13.0	Reference Frame: ICRS

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	(COS.ta.401074)	(3) SN2010JL	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				350 Secs *[==>]*	***[1]***
Comments: we will haev to update the acq time after getting the data in visit 20 *new light curve shows an estimated mag of B = 16.8 for May 15, 2012* *MIRROR B with 132 seconds yields a s/n = 40* *We observed sn2010jl with COS on 2011-01-23. by far the brightest feature in the spectrum is the sky Lyman- alpha. the spectrum can be viewed here. https://www.cfa.harvard.edu/~pchallis/sn2010jl_cos.ps* *a STIS image of the SN + host is here.. there is nothing nearby that is bright. https://www.cfa.harvard.edu/~pchallis/sn2010jl_pic.jpg* *https://www.cfa.harvard.edu/~pchallis/sn2010jl_pic.jpg*									
2	(COS.sp.352071)	(3) SN2010JL	COS/FUV, TIME-TAG, PSA	G160M 1589 A	BUFFER-TIME=1640; FP-POS=1			1750 Secs *[==>]*	***[1]***
3	(COS.sp.352071)	(3) SN2010JL	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=1240; FP-POS=2			1350 Secs *[==>]*	***[2]***
4	(COS.sp.352071)	(3) SN2010JL	COS/FUV, TIME-TAG, PSA	G160M 1611 A	BUFFER-TIME=1240; FP-POS=3			1350 Secs *[==>]*	***[2]***
5	(COS.sp.352071)	(3) SN2010JL	COS/FUV, TIME-TAG, PSA	G160M 1623 A	BUFFER-TIME=2840; FP-POS=4			2950 Secs *[==>]*	***[3]***

Orbit Structure