13320 - Unveiling the nature of ultraluminous X-ray sources via UV spectroscopy

Cycle: 21, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Fabien Grise (PI) (ESA Member) (Contact)	**Instituto de Astrofisica de Canarias**	**fabien-grise@uiowa.edu**
Dr. Philip Kaaret (CoI) (AdminUSPI)	University of Iowa	philip-kaaret@uiowa.edu
Prof. Stephane Corbel (CoI) (ESA Member)	Commissariat a l'Energie Atomique (CEA)	stephane.corbel@cea.fr
Dr. David Cseh (CoI) (ESA Member)	Radboud Universiteit Nijmegen	d.cseh@astro.ru.nl
Dr. Hua Feng (CoI)	Tsinghua University	hfeng@tsinghua.edu.cn
Dr. Lian Tao (CoI)	Tsinghua University	lian.taotao@gmail.com

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) NGC5408X-1	COS/FUV COS/NUV	4	21-Jun-2013 21:33:06.0	yes
02	(1) NGC5408X-1	COS/FUV COS/NUV	4	21-Jun-2013 21:33:16.0	yes

8 Total Orbits Used

ABSTRACT

Our recent HST/Chandra study of the ultraluminous X-ray source (ULX) in NGC 5408 showed that the X-ray/UV/optical/NIR spectral energy distribution (SED) is consistent with emission from an irradiated accretion disk, while the UV/optical/NIR SED alone can also be explained as a B0I supergiant star. If the accretion disk dominates in the far-UV, then we expect to see a wealth of spectral lines features in the far-UV spectrum. If,

instead, the far-UV light arises from an early B supergiant, we expect to see UV lines with strong P-Cygni profiles. To determine the physical origin of the UV/optical/NIR emission, we propose to take a deep look at the far-UV spectrum of the ULX using the unique capabilities of the Cosmic Origins Spectrograph. The spectrum obtained will definitively distinguish between an irradiated accretion disk and a supergiant companion star. Detection of UV lines is likely one of the only direct ways to constrain the physical nature of ultraluminous X-ray sources.

OBSERVING DESCRIPTION

This program consists of two COS observations (4 orbits each), to be carried out with the G140L spectral element at the central wavelength 1105 A. As recommended, we will be using all four FP-POS offsets.
Given the well-known position of the target, the acquisition will be done using the ACQ/IMAGE mode.

REAL TIME JUSTIFICATION

To look for variability, the second observation should be carried out at least 5 days after the first observation has been executed.

Visit

Proposal 13320, Visit 01 Sat Jun 22 01:33:24 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: (none)

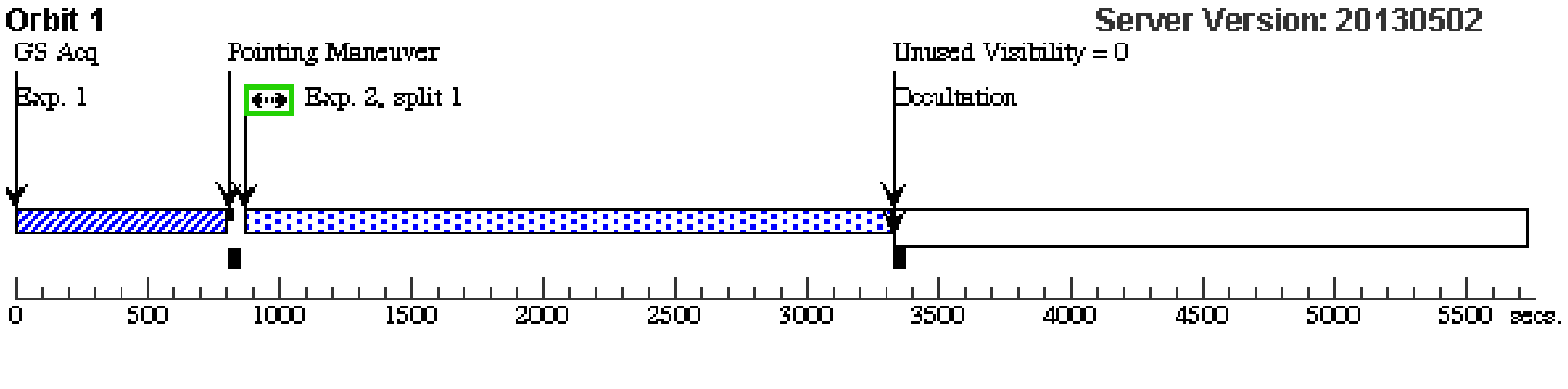
Fixed Targets

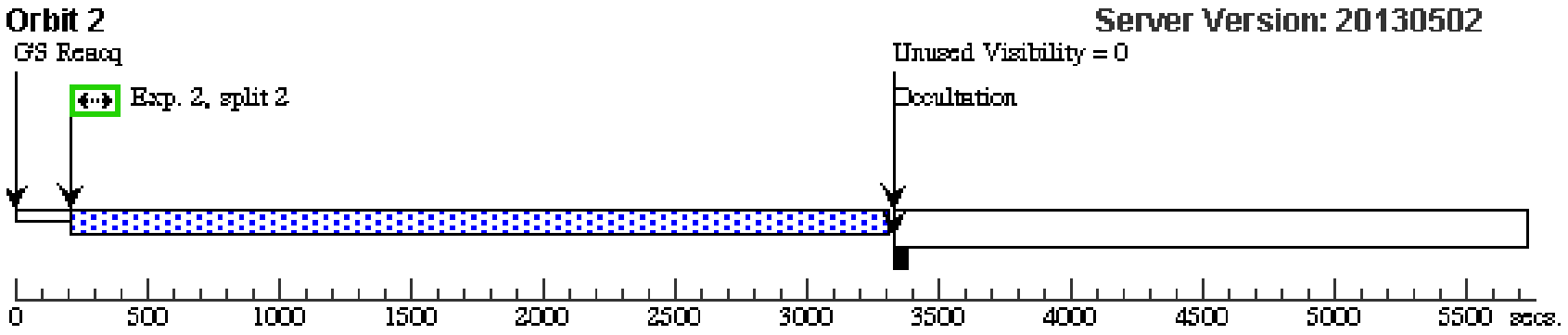
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC5408X-1	RA: 14 03 19.6200 (210.8317500d) Dec: -41 22 58.50 (-41.38292d) Equinox: J2000		V=22.4+/-0.1 m_F225W (VegaMag) = 20.05 + /- 0.1 ; F_F225W = 4.05 +/- 0.25 10^-17 erg/s/cm^2/A	Reference Frame: ICRS

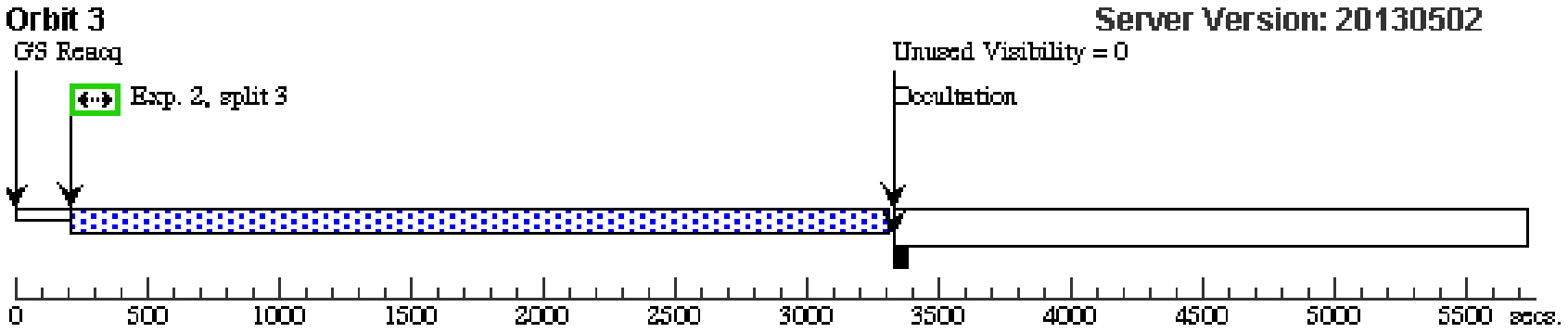
Exposures

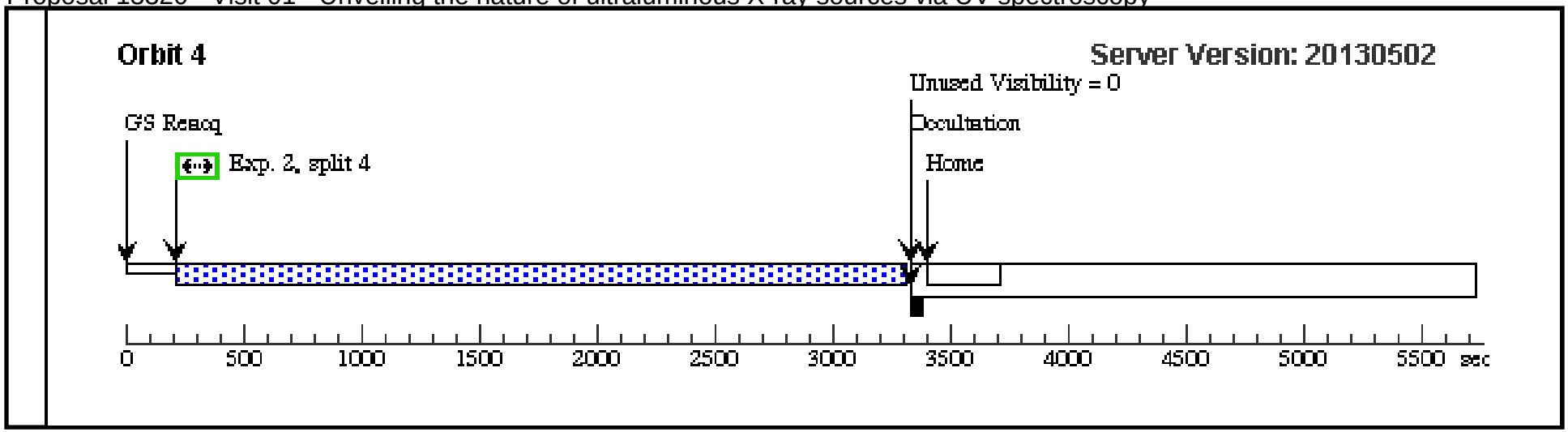
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.514217)	(1) NGC5408X-1	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				200 Secs (200 Secs)	
								[==>]	***[1]***
2	(COS.sp.514368)	(1) NGC5408X-1	COS/FUV, TIME-TAG, PSA	G140L 1105 A	FP-POS=ALL; BUFFER-TIME=8600; FLASH=YES; SEGMENT=A			2750 Secs (11408 Secs)	
								[==>2267.0 Secs (Split 1)]	***[1]***
								[==>3047.0 Secs (Split 2)]	***[2]***
								[==>3047.0 Secs (Split 3)]	***[3]***
								[==>3047.0 Secs (Split 4)]	***[4]***

Orbit Structure





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GS Reacq
Occultation
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500
1000
1500
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2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13320, Visit 02 Sat Jun 22 01:33:28 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: AFTER 01 BY 5 D TO 60 D

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC5408X-1	RA: 14 03 19.6200 (210.8317500d) Dec: -41 22 58.50 (-41.38292d) Equinox: J2000		V=22.4+/-0.1 m_F225W (VegaMag) = 20.05 +/- 0.1 ; F_F225W = 4.05 +/- 0.25 10^-17 erg/s/cm^2/A	Reference Frame: ICRS

Exposures

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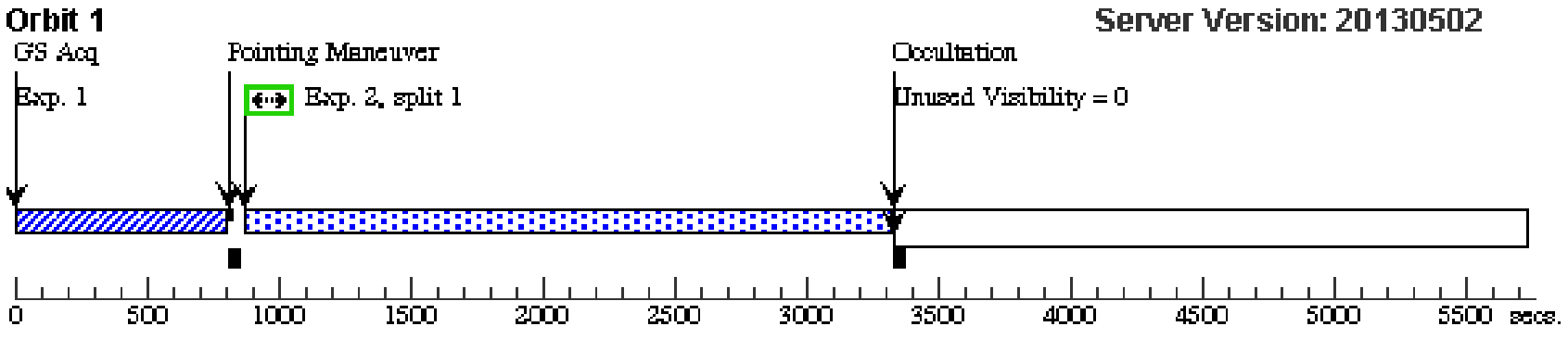
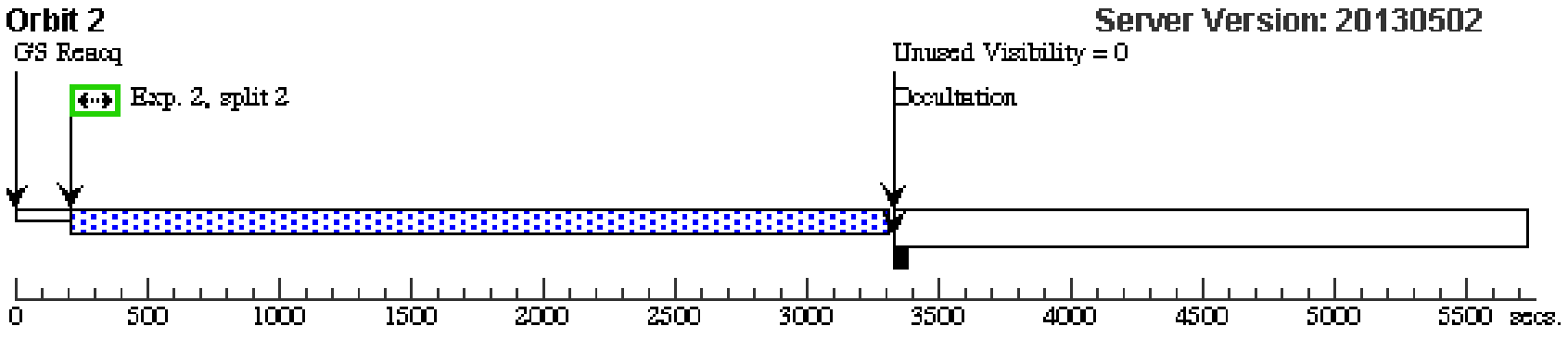
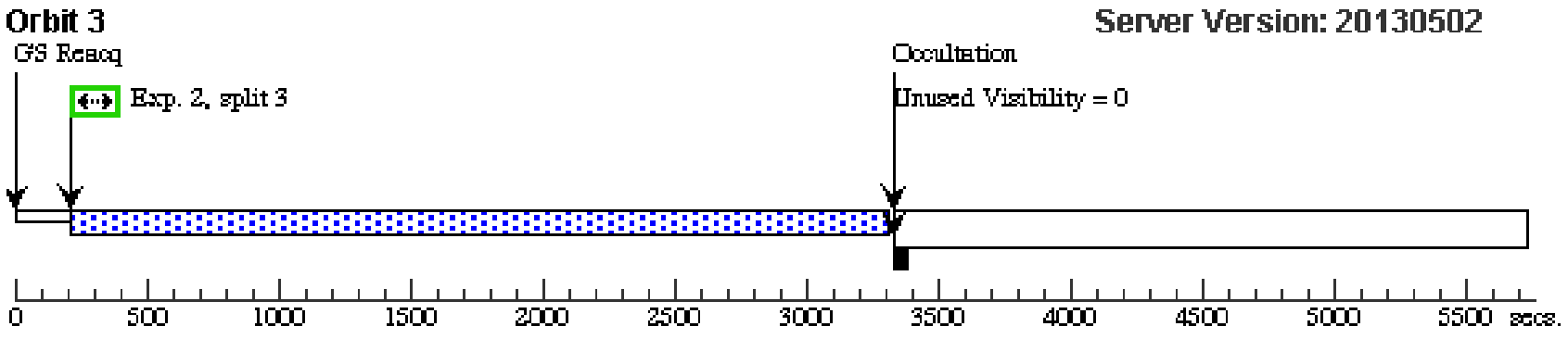
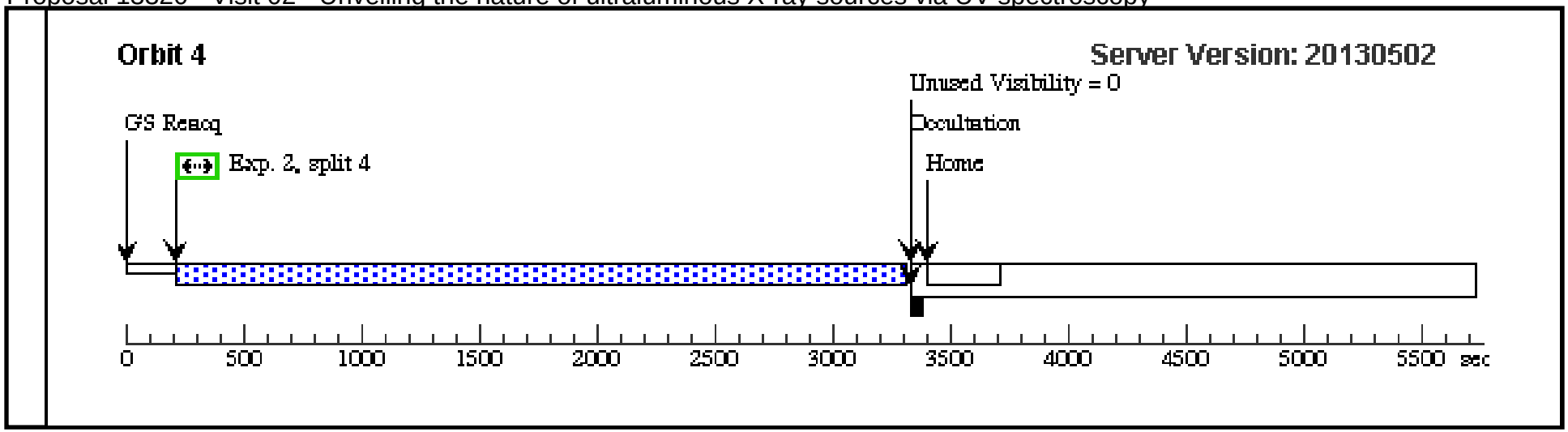
								[==>]	***[1]***
2	(COS.sp.514368)	(1) NGC5408X-1	COS/FUV, TIME-TAG, PSA	G140L 1105 A	FP-POS=ALL; BUFFER-TIME=8600; FLASH=YES; SEGMENT=A			2750 Secs (11408 Secs)	
								[==>2267.0 Secs (Split 1)]	***[1]***
								[==>3047.0 Secs (Split 2)]	***[2]***
								[==>3047.0 Secs (Split 3)]	***[3]***
								[==>3047.0 Secs (Split 4)]	***[4]***

Orbit Structure








Orbit 4
Server Version: 20130502
Unused Visibility = 0
GS Reacq
Occultation
Exp. 2, split 4
Home
0
500
1000
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sec