



13812 - Tomography of the innermost regions of NGC 985

Cycle: 22, Proposal Category: GO

(Availability Mode: SUPPORTED)

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	(1) NGC-985	COS/FUV COS/NUV	5	11-Jul-2014 21:03:49.0	yes
02	(1) NGC-985	COS/FUV COS/NUV	5	11-Jul-2014 21:03:53.0	yes

10 Total Orbits Used

ABSTRACT

AGN mass outflows inject enormous amounts of matter and energy into the interstellar medium of the host galaxy. Their location, structure, and importance as contributors to cosmic feedback processes are not yet fully understood. We propose to observe the Seyfert 1 galaxy NGC 985 with XMM-Newton for 240 ks using RGS as the prime instrument in order to accurately characterize the different ionized phases and kinematic components of the warm absorber. Together with HST/COS we will study the connection between the X-ray and UV absorbers and put stringent limits on the location of these winds in the context of the unification model of AGN.

OBSERVING DESCRIPTION

Our program consists of two 5-orbit visits simultaneous with two XMM-Newton observations. The second visit is nominally 12 days after the first XMM observation. For a median historical continuum flux of $2 \times 10^{-14} \text{ erg cm}^{-2} \text{ s}^{-1} \text{ A}^{-1}$ (Dunn et al. 2006, PASP, 118, 572) the on-line COS Exposure Time Calculator requires 2700 s in G130M/1309 to cover Ly-alpha and N V, 3200 s with G160M/1600 for Si IV and C IV, and 5700 s with G140L/1280 to cover Ly-beta and O VI. In a single 5-orbit visit we can achieve the requisite exposure times with all three gratings.

Each visit in our program will consist of multiple spectra for each grating. Since NGC 985 is faint enough, and all historical flux levels are more than a factor of two below safe limits, we will use an imaging target acquisition for each visit. For G130M, we will use three central wavelength settings that avoid placing the gap between segments A and B near the intrinsic absorption complex in NGC 985. At the same time, each central wavelength setting will obtain coverage of the segment gap in the other spectra. For each central wavelength setting, we will use different FP-POS settings, giving us a total of 4 independent grating settings with G130M that will allow us to eliminate all detector features and maximize our S/N in the merged spectrum. For G160M, we will again have 5 independent grating settings, but spread among four central wavelength settings in order to place the gap between the segments in the red wing of C IV as far from line center as possible, so that detector edge effects do not affect the intrinsic absorption lines in the blue wing of C IV.

To allow for a broad range of variability in NGC 985, we have chosen BUFFER TIMES significantly shorter than the 2/3 factor recommended in the ETC. We have also chosen the BUFFER TIMES to be integer multiples of (exposure time - 110 s) to minimize the overheads due to buffer readouts between successive exposures.

These observations pose no bright object concerns. All historical flux levels for NGC 985 lie well below the bright object limits for COS. Since Mrk 335 has been observed successfully before with STIS, there are also no surrounding field objects that are too bright. This is confirmed by the BOT tool for GALEX in APT. The violation indicated in the GSC-II BOT check is for the extended host galaxy.

Proposal 13812 - Visit 01 - Tomography of the innermost regions of NGC 985

Sat Jul 12 01:03:55 GMT 2014

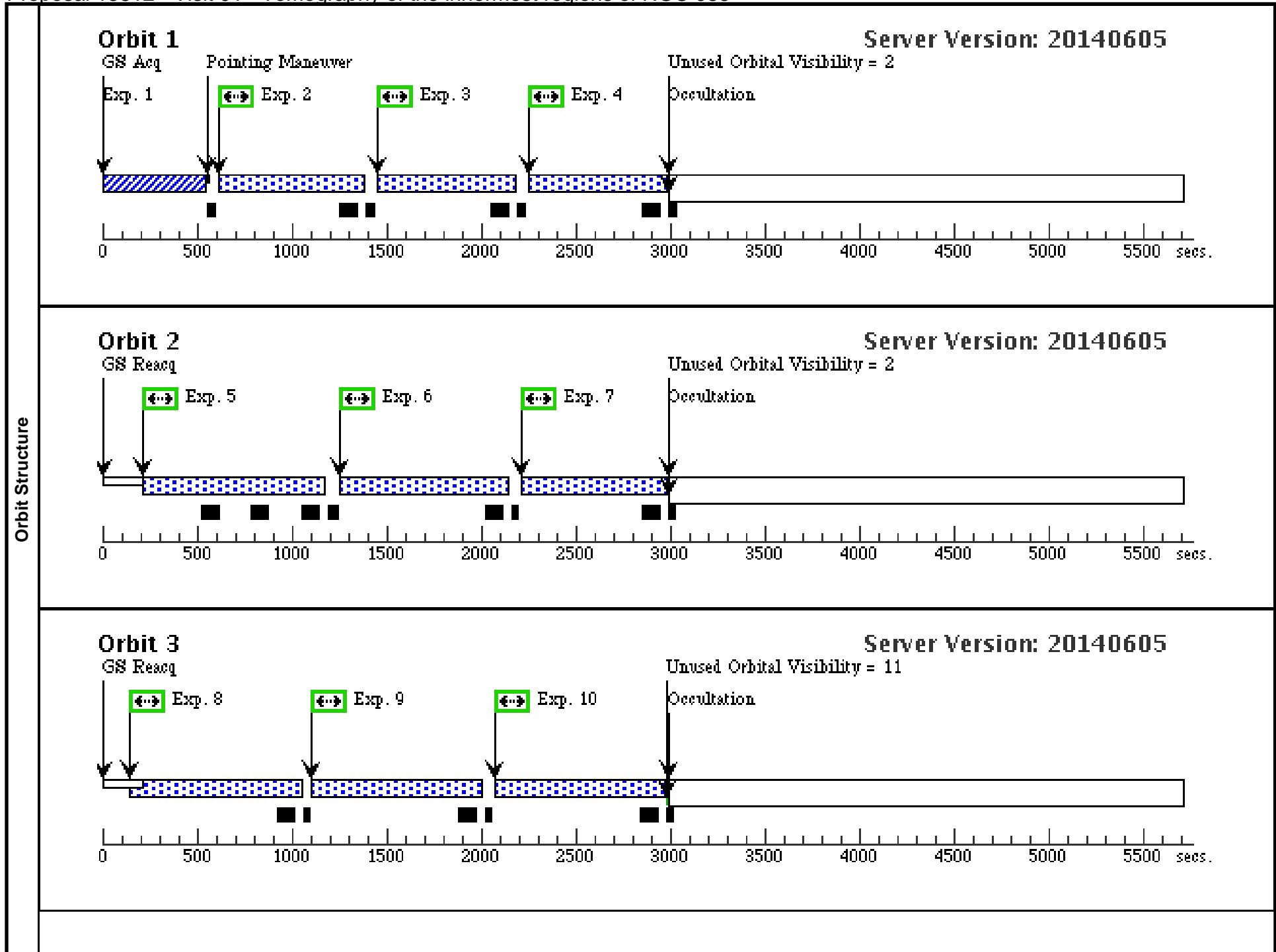
Visit	<p>Proposal 13812, Visit 01</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: COS/NUV, COS/FUV</p> <p>Special Requirements: SCHED 100%</p> <p><i>Comments: Simultaneous with first XMM-Newton visit.</i></p>												
Diagnostics	<p>(Visit 01) Warning (Form): If the target coordinates are not known to 0.4" (or better), an ACQ/SEARCH should precede the ACQ/IMAGE.</p> <p>(Visit 01) 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.</p>												
Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>NGC-985</td> <td>RA: 02 34 37.8820 (38.6578417d) Dec: -08 47 17.02 (-8.78806d) Equinox: J2000</td> <td></td> <td>V=14.28+/-0.5 1.47e-14 at 1413 A</td> <td>Reference Frame: ICRS</td> </tr> </tbody> </table> <p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i></p>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	NGC-985	RA: 02 34 37.8820 (38.6578417d) Dec: -08 47 17.02 (-8.78806d) Equinox: J2000		V=14.28+/-0.5 1.47e-14 at 1413 A	Reference Frame: ICRS
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Proposal 13812 - Visit 01 - Tomography of the innermost regions of NGC 985

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
Exposures	1	Target Acq (COS.ta.619 277)	(1) NGC-985	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			60. Secs (60 Secs) [==>]	[1]	
	<i>Comments: Exposure time is 5x ETC result to allow for target variability. We want to ensure successful target acquisition even if the target is much fainter than expected.</i>									
	2	G130M/129 1 (COS.sp.430 072)	(1) NGC-985	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=49 0; FP-POS=4			600 Secs (600 Secs) [==>]	[1]
	<i>Comments: 1291 with FP-POS=4 gives wavelength coverage down to 1130 A. Gap is still placed in red wing of Ly alpha, but far enough to the blue of N V to avoid the intrinsic absorption.</i>									
	3	G130M/130 9 (COS.sp.430 072)	(1) NGC-985	COS/FUV, TIME-TAG, PSA	G130M 1309 A	BUFFER-TIME=49 0; FP-POS=4			600 Secs (600 Secs) [==>]	[1]
	<i>Comments: 1309 with FP-POS=4 places gap on red side of N V, and avoids overlap with gap in subsequent 1327 exposures.</i>									
	4	G130M/132 7 FP-POS=1 (COS.sp.619 215)	(1) NGC-985	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=49 0; FP-POS=1			600 Secs (600 Secs) [==>]	[1]
	<i>Comments: 1327 with FP-POS=1 and 2 places gap in far red wing of N V, and non-overlapping with gaps in 1291 and 1309.</i>									
	5	G130M/132 7 FP-POS=2 (COS.sp.619 215)	(1) NGC-985	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=26 5; FP-POS=2			905 Secs (905 Secs) [==>]	[2]
	<i>Comments: 1327 with FP-POS=1 and 2 places gap in far red wing of N V, and non-overlapping with gaps in 1291 and 1309.</i>									
6	G160M/157 7 FP-POS=3 (COS.sp.619 217)	(1) NGC-985	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=60 5; FP-POS=3			715 Secs (715 Secs) [==>]	[2]	
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8	G160M/161 1 FP-POS=1 (COS.sp.430 073)	(1) NGC-985	COS/FUV, TIME-TAG, PSA	G160M 1611 A	BUFFER-TIME=66 5; FP-POS=1			775 Secs (775 Secs) [==>]	[3]	
<i>Comments: 1611 with FP-POS=1 places gap in far wing of C IV with no overlap with gaps in other central wavelength settings.</i>										
9	G160M/160 0 FP-POS=2 (COS.sp.430 073)	(1) NGC-985	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=66 5; FP-POS=2			775 Secs (775 Secs) [==>]	[3]	
<i>Comments: 1600 with FP-POS=2 places gap in far wing of C IV with no overlap with gaps in other central wavelength settings.</i>										
10	G160M/158 9 FP-POS=3 (COS.sp.619 222)	(1) NGC-985	COS/FUV, TIME-TAG, PSA	G160M 1589 A	BUFFER-TIME=66 5; FP-POS=3			775 Secs (775 Secs) [==>]	[3]	
<i>Comments: 1589 with FP-POS=3 places gap in far wing of C IV with no overlap with gaps in other central wavelength settings.</i>										

Proposal 13812 - Visit 01 - Tomography of the innermost regions of NGC 985

11	G140L/1280 (1) NGC-985 (COS.sp.430 078)	COS/FUV, TIME-TAG, PSA	G140L 1280 A	BUFFER-TIME=39 0; FP-POS=ALL	1290 Secs (5160 Secs)	
					[==>(Split 1)]	[4]
					[==>(Split 2)]	
					[==>(Split 3)]	[5]
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<p><i>Comments: Buffer time reduced by more than 2/3 of the ETC value to allow for source variability. Buffer times also chosen to be (exposure time - 110 s)/n to minimize overheads due to buffer dumps between exposures.</i></p>						

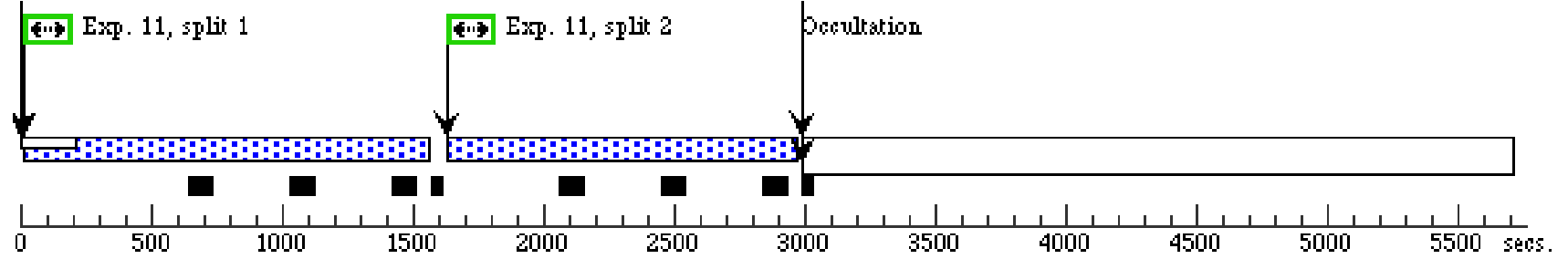


Orbit 4

Server Version: 20140605

GS Reacq

Unused Orbital Visibility = 6

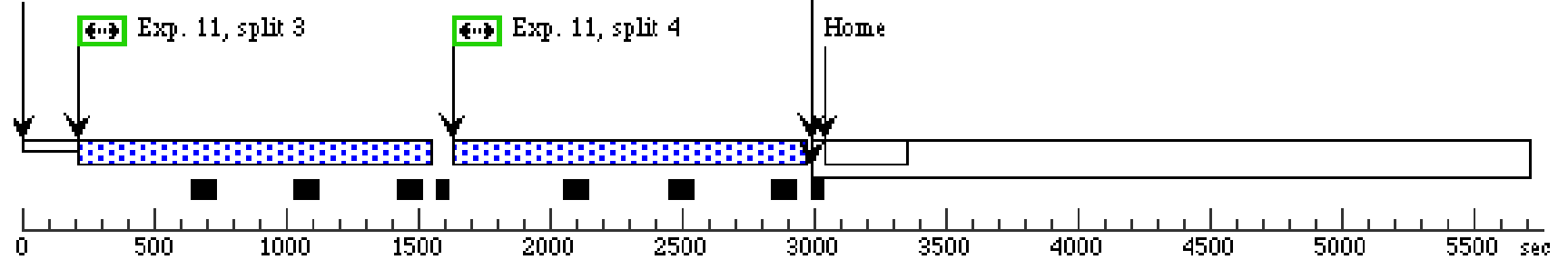


Orbit 5

Server Version: 20140605

GS Reacq

Unused Orbital Visibility = 8



Proposal 13812 - Visit 02 - Tomography of the innermost regions of NGC 985

Sat Jul 12 01:03:55 GMT 2014

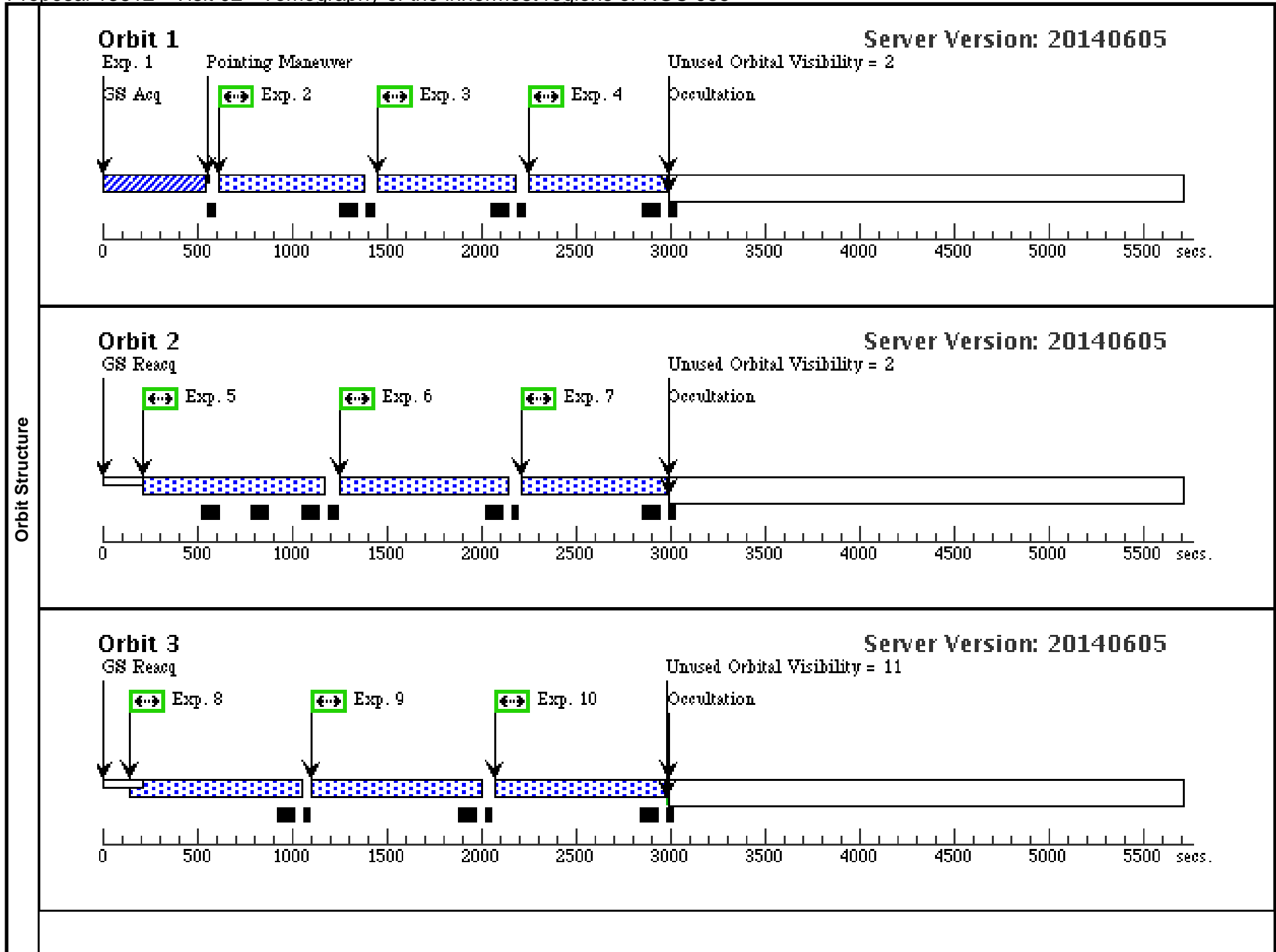
Visit	<p>Proposal 13812, Visit 02</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: COS/NUV, COS/FUV</p> <p>Special Requirements: SCHED 100%</p> <p><i>Comments: Simultaneous with second XMM-Newton visit. This is nominally 12 days after the first observation.</i></p>												
Diagnostics	<p>(Visit 02) Warning (Form): If the target coordinates are not known to 0.4" (or better), an ACQ/SEARCH should precede the ACQ/IMAGE.</p> <p>(Visit 02) 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.</p>												
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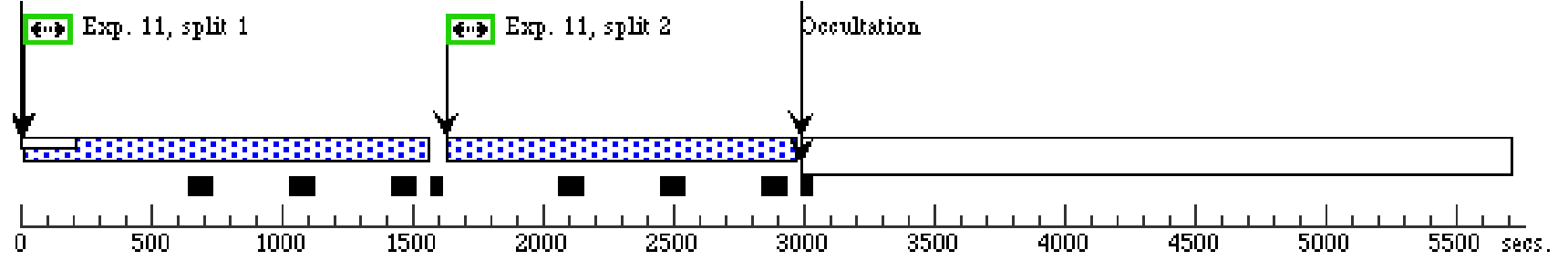


Orbit 4

Server Version: 20140605

GS Reacq

Unused Orbital Visibility = 6



Orbit 5

Server Version: 20140605

GS Reacq

Unused Orbital Visibility = 8

