13525 - COS FUV Detector Gain Maps

Cycle: 21, Proposal Category: CAL/COS

(Availability Mode: RESTRICTED)

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	DEUTERIUM NONE	COS COS/FUV	1	16-Dec-2014 15:44:19.0	yes
02	DEUTERIUM NONE	COS COS/FUV	1	16-Dec-2014 15:44:20.0	yes
11	DEUTERIUM NONE	COS COS/FUV	1	16-Dec-2014 15:44:21.0	yes
12	DEUTERIUM NONE	COS COS/FUV	1	16-Dec-2014 15:44:22.0	yes

4 Total Orbits Used

ABSTRACT

This program uses the deuterium lamp to illuminate the entire region of the detector currently being used to collect spectra. The data obtained will be used to create gain maps of the detector. Because of the strongly varying intensity of the lamp as a function of wavelength, G130M/1309 data will be obtained for Segment A, and G160M/1600 will be used for Segment B.

Gain map data will be obtained both before and after any change is made to the nominal high voltage value on either segment.

OBSERVING DESCRIPTION

This program will obtain spectra from the deuterium lamp with enough counts to permit the construction of a gain map covering the region where the spectra fall at the current lifetime position. In order to efficiently illuminate the two segments, the G130M/1309 setting will be used for Segment A, and G160M/1600 will be used for Segment B. Both segments can safely remain on with either setting.

The procedure for collecting this data is:

* Adjust the aperture in the cross dispersion direction so that the deuterium lamp will illuminate the appropriate region on Segment A when using G130M/1309. For LP2, LAPXSTP should be -235.

* Take a 400 second deuterium lamp exposure using both detector segments.

* Adjust the aperture in the cross dispersion direction so that the deuterium lamp will illuminate the appropriate region on Segment B when using G160M/1600. For LP2, LAPXSTP should be -241. Since TRANS resets its aperture zero point when the previous FCA exposure is taken, the aperture is explicitly moved by -6 steps, as it was in Program 13494.

* Take a 400 second deuterium lamp exposure using both detector segments.

------ Calibration Justification -------

Obtaining a gain map both before and after each change in the high voltage will help to improve the modeling of the modal gain as a function of time and extracted charge, since it will provide data that cover the full timespan of each high voltage. Improving these models will allow better predictions of the future lifetime of the detector.

--------- Additional Comments ----------

The first use of this program is likely to be while the nominal spectral location is at LP2. See the Observing Description in Program 13494 for an explanation of how the aperture position was chosen for this LP. If the Lifetime Position is changed, the aperture position will be adjusted.

Two Additional visits (11 and 12) were added on October 9, 2014. These visits are copies of Visits 01 and 02, and will be used before and after the Segment A High Voltage Change at LP2, which is scheduled for early November.

Visit

Proposal 13525, Before HV Change (01), completed Tue Dec 16 20:44:23 GMT 2014

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS

Special Requirements: PARALLEL

Comments: This visit collects data before the HV is increased; it should be the last COS visit executed before the HV change.

Diagnostics

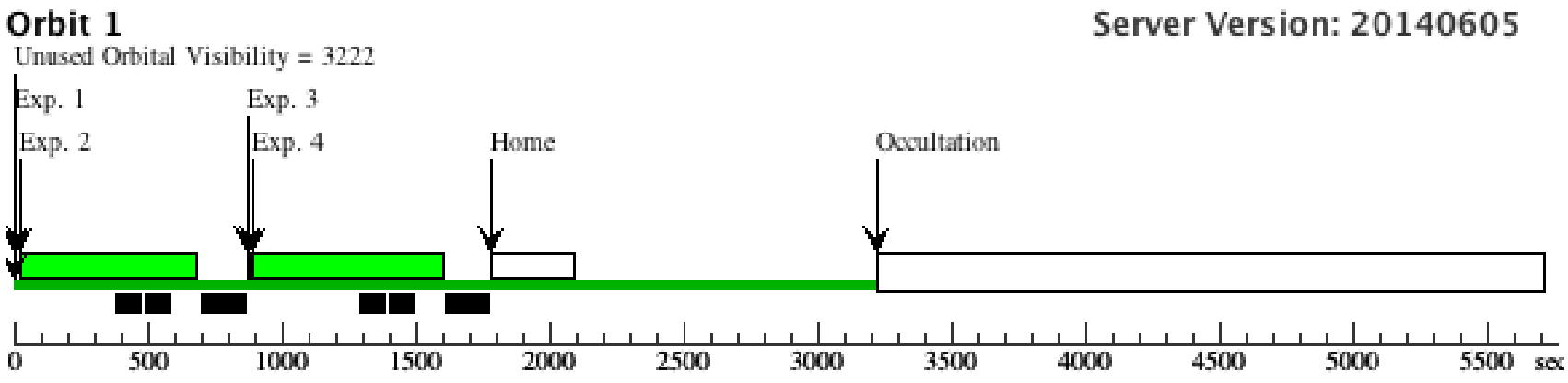
(Before HV Change (01)) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU

(Aperture Adjustment for Segment A (01.001)) Warning (Form): This ALIGN/APER exposure should be preceded by a science exposure to define the starting position for the scan.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Aperture Adjustment for Segment A	NONE	COS, ALIGN/APER		XAPER=-287			0.0 Secs (0 Secs) *[==>]*	*[1]*
Comments: Put the aperture in the appropriate position to illuminate the correct region of the detector when illuminating Segment A with G130M/1309. *PSA LAPXSTP value at LP2 is 52.1* *Desired LAPXSTP value for FCA to illuminate Segment A with G130M/1309 is -235* *Therefore, XAPER is set to -287*									
2	G130M/1309 Deuterium Exposure	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G130M 1309 A	CURRENT=MEDIUM; BUFFER-TIME=111; FP-POS=1			400 Secs (400 Secs) *[==>]*	*[1]*
Comments: Deuterium exposure optimized for Segment A. FP-POS=1 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.									
3	Aperture Adjustment for Segment B	NONE	COS, ALIGN/APER		XAPER=-293	QESIPARM XSTEPS -6		0.0 Secs (0 Secs) *[==>]*	*[1]*
Comments: Put the aperture in the appropriate position to illuminate the correct region of the detector when illuminating Segment B with G160M/1600. *PSA LAPXSTP value at LP2 is 52.1* *Desired LAPXSTP value for FCA to illuminate Segment B with G160M/1600 is -241* *Therefore, XAPER is set to -293. But because of the TRANS rules, the "QESIPARM XSTEPS -6" Special Requirement is required to move the aperture to the correct location.*									
4	G160M/1600 Deuterium Exposure	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G160M 1600 A	CURRENT=MEDIUM; BUFFER-TIME=111; FP-POS=4			400 Secs (400 Secs) *[==>]*	*[1]*
Comments: Deuterium exposure optimmized for Segment B. FP-POS=4 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.									

Orbit Structure



Visit

Proposal 13525, After HV Change (02), completed Tue Dec 16 20:44:24 GMT 2014

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS

Special Requirements: AFTER 01; PARALLEL

Comments: This visit collects data after the HV is increased; it should be the first COS visit executed after the HV change.

Diagnostics

(After HV Change (02)) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU

(Aperture Adjustment for Segment A (02.001)) Warning (Form): This ALIGN/APER exposure should be preceded by a science exposure to define the starting position for the scan.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Aperture Adjustment for Segment A	NONE	COS, ALIGN/APER		XAPER=-287			0.0 Secs (0 Secs) *[==>]*	*[1]*
2	G130M/1309 Deuterium Exposure	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G130M 1309 A	CURRENT=MEDIUM; BUFFER-TIME=111; FP-POS=1			400 Secs (400 Secs) *[==>]*	*[1]*
3	Aperture Adjustment for Segment B	NONE	COS, ALIGN/APER		XAPER=-293	QESIPARM XSTEPS -6		0.0 Secs (0 Secs) *[==>]*	*[1]*
4	G160M/1600 Deuterium Exposure	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G160M 1600 A	CURRENT=MEDIUM; BUFFER-TIME=111; FP-POS=4			400 Secs (400 Secs) *[==>]*	*[1]*

Comments: Put the aperture in the appropriate position to illuminate the correct region of the detector when illuminating Segment A with G130M/1309.

PSA LAPXSTP value at LP2 is 52.1
Desired LAPXSTP value for FCA to illuminate Segment A with G130M/1309 is -235

Therefore, XAPER is set to -287

Comments: Deuterium exposure optimized for Segment A. FP-POS=1 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.

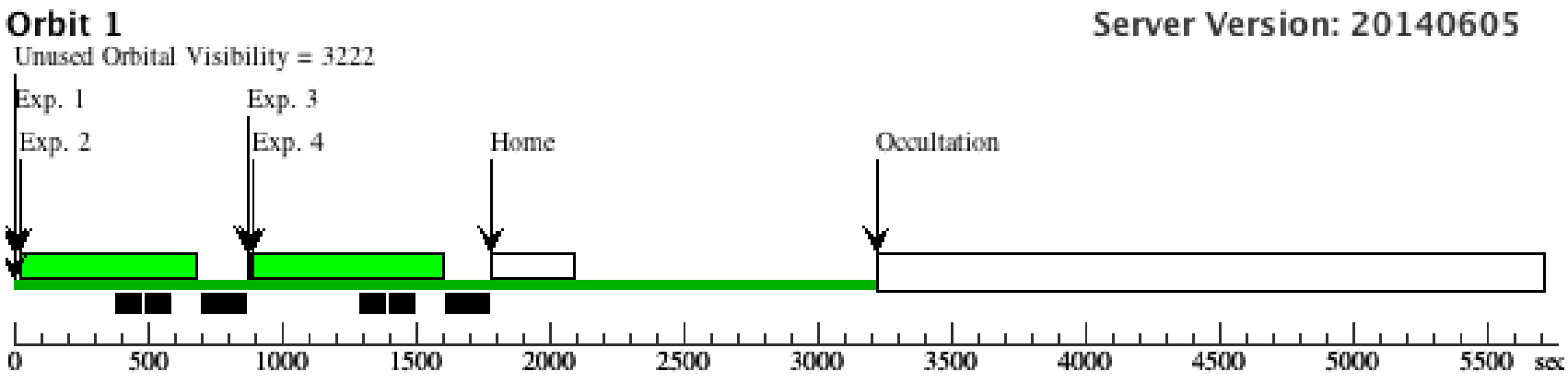
Comments: Put the aperture in the appropriate position to illuminate the correct region of the detector when illuminating Segment B with G160M/1600.

PSA LAPXSTP value at LP2 is 52.1
Desired LAPXSTP value for FCA to illuminate Segment B with G160M/1600 is -241

Therefore, XAPER is set to -293. But because of the TRANS rules, the "QESIPARM XSTEPS -6" Special Requirement is required to move the aperture to the correct location.

Comments: Deuterium exposure optimmized for Segment B. FP-POS=4 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.

Orbit Structure



Visit

Proposal 13525, Before Segment A HV Change (11) Tue Dec 16 20:44:24 GMT 2014

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS

Special Requirements: PARALLEL

Comments: This visit collects data before the HV is increased; it should be the last COS visit executed before the Segment A HV change in November 2014.

Diagnostics

(Before Segment A HV Change (11)) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU

(Aperture Adjustment for Segment A (11.001)) Warning (Form): This ALIGN/APER exposure should be preceded by a science exposure to define the starting position for the scan.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Aperture Adjustment for Segment A	NONE	COS, ALIGN/APER		XAPER=-287			0.0 Secs (0 Secs) *[==>]*	***[1]***

Comments: Put the aperture in the appropriate position to illuminate the correct region of the detector when illuminating Segment A with G130M/1309.

PSA LAPXSTP value at LP2 is 52.1
Desired LAPXSTP value for FCA to illuminate Segment A with G130M/1309 is -235

Therefore, XAPER is set to -287

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	G130M/1309 Deuterium Exposure	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G130M 1309 A	CURRENT=MEDIUM; BUFFER-TIME=111; FP-POS=1			400 Secs (400 Secs) *[==>]*	***[1]***

Comments: Deuterium exposure optimized for Segment A. FP-POS=1 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
3	Aperture Adjustment for Segment B	NONE	COS, ALIGN/APER		XAPER=-293	QESIPARM XSTEPS -6		0.0 Secs (0 Secs) *[==>]*	***[1]***

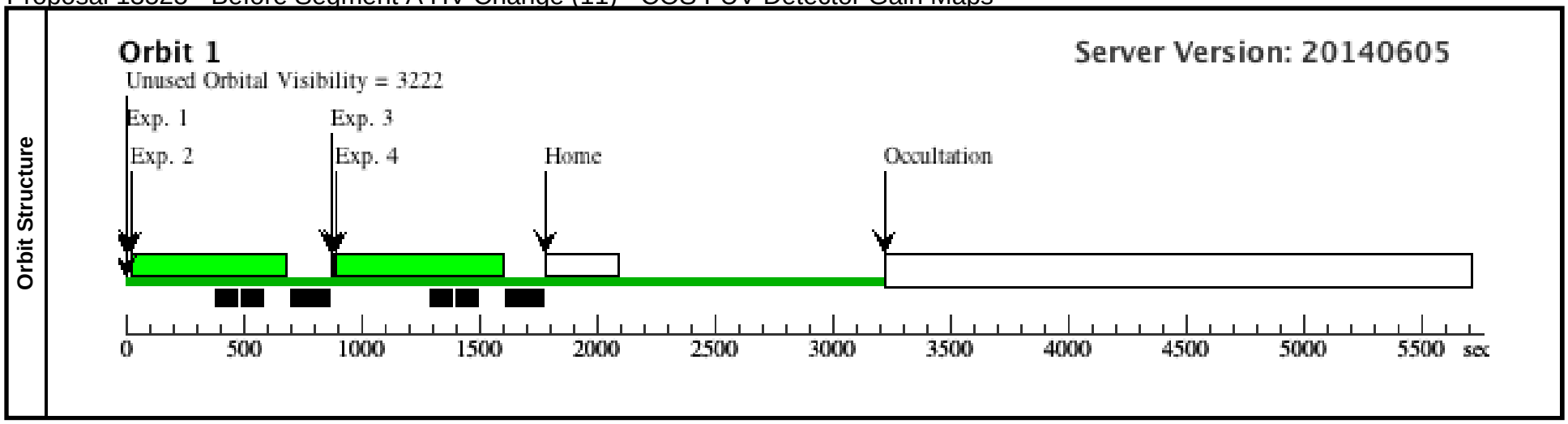
Comments: Put the aperture in the appropriate position to illuminate the correct region of the detector when illuminating Segment B with G160M/1600.

PSA LAPXSTP value at LP2 is 52.1
Desired LAPXSTP value for FCA to illuminate Segment B with G160M/1600 is -241

Therefore, XAPER is set to -293. But because of the TRANS rules, the "QESIPARM XSTEPS -6" Special Requirement is required to move the aperture to the correct location.

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
4	G160M/1600 Deuterium Exposure	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G160M 1600 A	CURRENT=MEDIUM; BUFFER-TIME=111; FP-POS=4			400 Secs (400 Secs) *[==>]*	***[1]***

Comments: Deuterium exposure optimmized for Segment B. FP-POS=4 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.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Orbit 1
Server Version: 20140605
Unused Orbital Visibility = 3222
Exp. 1
Exp. 2
Exp. 3
Exp. 4
Home
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13525, After Segment A HV Change (12) Tue Dec 16 20:44:24 GMT 2014

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS

Special Requirements: AFTER 11; PARALLEL

Comments: This visit collects data after the HV is increased; it should be one of the first COS visit executed after the Segment A HV change in November 2014.

Diagnostics

(After Segment A HV Change (12)) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU

(Aperture Adjustment for Segment A (12.001)) Warning (Form): This ALIGN/APER exposure should be preceded by a science exposure to define the starting position for the scan.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Aperture Adjustment for Segment A	NONE	COS, ALIGN/APER		XAPER=-287			0.0 Secs (0 Secs) *[==>]*	***[1]***
2	G130M/1309 Deuterium Exposure	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G130M 1309 A	CURRENT=MEDIUM; BUFFER-TIME=111; FP-POS=1			400 Secs (400 Secs) *[==>]*	***[1]***
3	Aperture Adjustment for Segment B	NONE	COS, ALIGN/APER		XAPER=-293	QESIPARM XSTEPS -6		0.0 Secs (0 Secs) *[==>]*	***[1]***
4	G160M/1600 Deuterium Exposure	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G160M 1600 A	CURRENT=MEDIUM; BUFFER-TIME=111; FP-POS=4			400 Secs (400 Secs) *[==>]*	***[1]***

Comments: Put the aperture in the appropriate position to illuminate the correct region of the detector when illuminating Segment A with G130M/1309.

PSA LAPXSTP value at LP2 is 52.1
Desired LAPXSTP value for FCA to illuminate Segment A with G130M/1309 is -235

Therefore, XAPER is set to -287

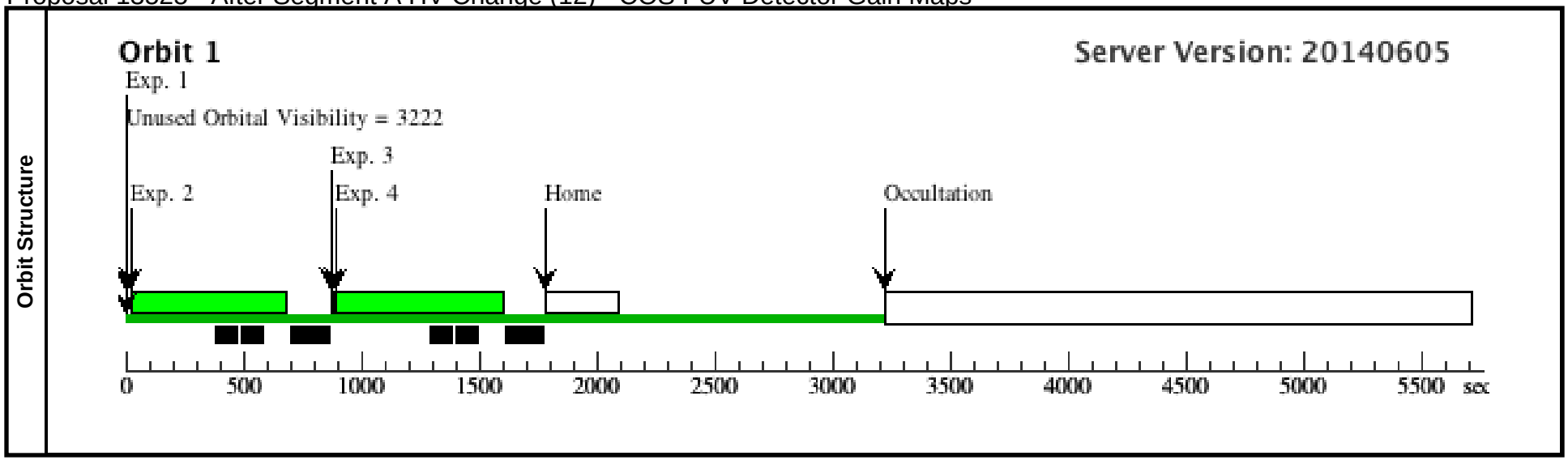
Comments: Deuterium exposure optimized for Segment A. FP-POS=1 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.

Comments: Put the aperture in the appropriate position to illuminate the correct region of the detector when illuminating Segment B with G160M/1600.

PSA LAPXSTP value at LP2 is 52.1
Desired LAPXSTP value for FCA to illuminate Segment B with G160M/1600 is -241

Therefore, XAPER is set to -293. But because of the TRANS rules, the "QESIPARM XSTEPS -6" Special Requirement is required to move the aperture to the correct location.

Comments: Deuterium exposure optimmized for Segment B. FP-POS=4 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.


Orbit Structure
Orbit 1
Server Version: 20140605
Exp. 1
Unused Orbital Visibility = 3222
Exp. 3
Exp. 2
Exp. 4
Home
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec