

# 16052 - Testing for Systematics When Moving the COS Aperture Block

Cycle: 27, Proposal Category: CAL/COS (Availability Mode: RESTRICTED)

#### **INVESTIGATORS**

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#### **VISITS**

Visit	Targets used in Visit	Configurations used in Visit	Orbits Used		OP Current with Visit?
01	NONE WAVE	COS COS/FUV	3	07-Nov-2019 13:01:21.0	yes
		COS/NUV			

<sup>3</sup> Total Orbits Used

#### **ABSTRACT**

When operating at LP5, the G160M wavecal exposures will need to occur at LP2 due to light leaking through the FCA at 5.5". As such, we need to investigate if there are systematic effects introduced by obtaining science at LP5 and wavecal exposures at LP2, that would affect the wavelength calibration for G160M when operating at LP5. With that goal in mind, this program is designed to determine whether there is movement on the

Proposal 16052 (STScI Edit Number: 0, Created: Thursday, November 7, 2019 at 1:01:23 PM Eastern Standard Time) - Overview detector in the dispersion (x) or cross-dispersion direction (y) when moving the aperture between LP2 and LP5.

The basic design of the program is to obtain a series of lamp flashes at LP2 and LP5 on the detector, emulating how G160M operations coupld potenatially occur at LP5 if wavecals cannot be taken concurrently with the science exposures. At each LP, we perform 5x50s lampflashes before moving to the next LP. Each LP will be sampled 5 times. The spectra will then cross-correlated to assess changes in pixel space to check for aperture shift and/or drift in x-dispersion and dispersion direction.

#### **OBSERVING DESCRIPTION**

The aperture is moved between LP2 and LP5 five times. Each time, the wavecal lamp is flashed for 50s every 200s. This will allow us to investigate the existence of shift/drift in the dispersion and cross-dispersion direction due to movement of the COS aperture.

From program 16006 we know that WCA FUVA G160M/1577 can be operated at LP5 (+5.4") without light leak

All lamp exposures to be taken with G160M/1577/FUVA, FP-POS=4 and the default lamp setting (LAMP = PtNe1 with current = Medium)

In order to minimize the amount of OSM drift, we start the program with a lamp image using mirror A (i.e. engaging the OSM position at NCM1 before we move to G160M). We do this because OSM drift studies have shown that the settling time for OSM drift is shorter when the OSM mechanism moves from NCM1->G160M compared to G130M->G160M. Then, in order to isolate shift/drift due to aperture movement \*only\*, the program takes a long lamp exposure at LP2 for t=2000s using 50s flashes every 200s, to allow OSM1 to fully settle. There are no OSM movements in subsequent exposures, with all G160M/1577/FUVA exposures taken at the LP2 focus.

### Program design:

- (1) Lamp image with mirror A to move OSM mechanism to NCM1
- (2) Settling exposure at LP2
- (3) LP2 lampflash exposure
- (4) Aperture move to LP5
- (5) LP5 lampflash exposure
- (6) Aperture move to LP2
- (7) Repeat (2)-(5) 4 times.

Proposal 16052 (STScI Edit Number: 0, Created: Thursday, November 7, 2019 at 1:01:23 PM Eastern Standard Time) - Overview

## Exposure times:

- -50s gives peak counts of 20-50 in G160M/FUVA lines which are ~0.4-1 cnts/s
- -Flash sequence of 50s on every 200s (50:150, on:off) is consistent with 1:3 on:off lamp flash ratio deemed safe for temperature offset between the lamp and the chamber.

XSTEPS qesiparms are needed, with the relative move between one exposure and the next.

All the exposures have LIFETIME-POSITION = LP2

In order for us to accurately test for drift due to aperture movement, it is essential that the exposures after an aperture movement are not interrupted. As such, aperture movements and the exposure following an aperture movement are inside a non-interruptible sequence to facilitate visit scheduling around SAA interruptions.

>>> Please note that SQL will be needed to by-pass calibration. <<<

>>> Files should not be associated <<<

<u>Pro</u>	oposal 16052 - Visit 01 - Testing for Systematics When Moving the COS Aperture Block	
	Proposal 16052, Visit 01	Thu Nov 07 18:01:23 GMT 2019
isit	Diagnostic Status: Warning	
	Scientific Instruments: COS, COS/FUV, COS/NUV	
	Special Requirements: (none)	
ı	(Visit 01) Warning (Orbit Planner): LAMP EXPOSURE EXCEEDS 300 SECONDS	
ı	(Visit 01) Warning (Orbit Planner): LAMP EXPOSURE EXCEEDS 300 SECONDS	
ı	(Visit 01) Warning (Orbit Planner): LAMP EXPOSURE EXCEEDS 300 SECONDS	
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ı	(Visit 01) Warning (Orbit Planner): LAMP EXPOSURE EXCEEDS 300 SECONDS	
ı	(Visit 01) Warning (Orbit Planner): LAMP EXPOSURE EXCEEDS 300 SECONDS	
	(Visit 01) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU	

Proposal 16052 - Visit 01 - Testing for Systematics When Moving the COS Aperture Block

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Regs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Lamp image	WAVE	COS/NUV, TIME-TAG, WCA	MIRRORA				10 Secs (10 Secs)	
								[==>]	[1]
Com	ments: Lamp	image to engage	OSM mechanism at NCM1 before we mo	ve to G160M					
2	Long lamp s		COS/FUV, TIME-TAG, WCA	G160M	FLASH=S0200D050	)		2000 Secs (2000 Secs)	
	ettling OSM			1577 A	;			f==>1	
	drift				FP-POS=4;				
					LIFETIME-POS=L				[1]
					P2;				
					SEGMENT=BOTH				
Com	ments: Long	lamp exposure to	allow for OSM settling						
3	Wave_LP2_	WAVE	COS/FUV, TIME-TAG, WCA	G160M	FLASH=S0200D050	)		1000 Secs (1000 Secs)	
	1			1577 A	;			I = => J	
					FP-POS=4;				
					SEGMENT=A;				[1]
					LIFETIME-POS=L				
_	_				P2				
	ments: Expos	ure at LP2 -pass calibration							
	Ap_move_+		COS, ALIGN/APER		XAPER=-40;		Sequence 4-5 Non-In	0 Secs (0 Secs)	T
-	5.4	NONE	COS, ALION/AI EK		YAPER=0		t in Visit 01	[==>]	[1]
_			ve the aperture from +3.5" (LP2) to +5.4		IAFER-U			[>]	[1]
Conv XAP	version is ER = 21 steps	s per arcsec or 1 s	$re\ step => XAPER = -40\ steps$ $step = 0.0476''$						
XAP. XSTI	ER = 21 steps EPS is not req	s per arcsec or 1 s quired for first ape	step = 0.0476" erture move because it is relative to previ	-		)	Sequence 4-5 Non-In	1000 Secs (1000 Secs)	
XAP. XSTI	ER = 21 steps	s per arcsec or 1 s quired for first ape	step = 0.0476"	G160M	f which there was none.  FLASH=S0200D050;	)	Sequence 4-5 Non-In t in Visit 01	1000 Secs (1000 Secs)	
XAP. XSTI	ER = 21 steps  EPS is not req Wave_LP5_	s per arcsec or 1 s quired for first ape	step = 0.0476" erture move because it is relative to previ	-		)	Sequence 4-5 Non-In t in Visit 01	1000 Secs (1000 Secs)  [==>]	
XAP. XSTI	ER = 21 steps  EPS is not req Wave_LP5_	s per arcsec or 1 s quired for first ape	step = 0.0476" erture move because it is relative to previ	G160M	FLASH=S0200D050;	)	Sequence 4-5 Non-In t in Visit 01		[1]
XAP. XSTI	ER = 21 steps  EPS is not req Wave_LP5_	s per arcsec or 1 s quired for first ape	step = 0.0476" erture move because it is relative to previ	G160M	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L	)	Sequence 4-5 Non-In t in Visit 01		[1]
XAP. XSTI	ER = 21 steps  EPS is not req Wave_LP5_	s per arcsec or 1 s quired for first ape	step = 0.0476" erture move because it is relative to previ	G160M	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A;	)	Sequence 4-5 Non-In t in Visit 01		[1]
XAP. XSTI	ER = 21 stepsEPS is not red Wave_LP5_ 1 ments: Expos	s per arcsec or 1 s quired for first ape WAVE	step = 0.0476" erture move because it is relative to previ	G160M	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L	)	Sequence 4-5 Non-In t in Visit 01		[1]
XAP. XSTI  5	ER = 21 steps: EPS is not req Wave_LP5_ 1  ments: Expos needed to by:	s per arcsec or 1 s quired for first ape WAVE WAVE ure at +5.4" -pass calibration	step = 0.0476" erture move because it is relative to previ COS/FUV, TIME-TAG, WCA	G160M	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2		t in Visit 01	[==>]	[1]
XAP. XSTI  5	ER = 21 steps: EPS is not red Wave_LP5_ 1  ments: Expos needed to by: Ap_move_L	s per arcsec or 1 s quired for first ape WAVE WAVE ure at +5.4" -pass calibration	step = 0.0476" erture move because it is relative to previ	G160M	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2	QESIPARM XSTEF	t in Visit 01  Sequence 6-7 Non-In	[==>]  0 Secs (0 Secs)	
XAP. XSTI  5  Com. SQL	ER = 21 steps: EPS is not req Wave_LP5_ 1  ments: Expos needed to by: Ap_move_L P2	s per arcsec or 1 s quired for first ape . WAVE . WAVE . was at +5.4" . NONE	step = 0.0476"  erture move because it is relative to previ COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0	QESIPARM XSTEF S 40	t in Visit 01	[==>]	
XAP. XSTI  5  Com SQL  6	ER = 21 steps: EPS is not red Wave_LP5_ 1  ments: Expos needed to by: Ap_move_L P2  ments: In this	s per arcsec or 1 s quired for first ape WAVE  were at +5.4" -pass calibration NONE s exposure we mov	ctep = 0.0476"  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The aperture from +5.4" (LP5) to +3.5	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0	QESIPARM XSTEF S 40	t in Visit 01  Sequence 6-7 Non-In	[==>]  0 Secs (0 Secs)	
XAP. XSTI  5  Com SQL  6	ER = 21 steps: EPS is not red Wave_LP5_ 1  ments: Expos needed to by: Ap_move_L P2  ments: In this	s per arcsec or 1 s quired for first ape WAVE  were at +5.4" -pass calibration NONE s exposure we mov	step = 0.0476"  erture move because it is relative to previ COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0	QESIPARM XSTEF S 40	t in Visit 01  Sequence 6-7 Non-In	[==>]  0 Secs (0 Secs)	
XAP. XSTI  5  Com. SQL  6  Com. So, (	ER = 21 stepsEPS is not red Wave_LP5_  ments: Expos needed to by. Ap_move_L P2 ments: In this 3.5-3.5)"/0.04 version is	s per arcsec or 1 s quired for first ape WAVE  were at +5.4" -pass calibration NONE s exposure we mov 476 arcsec/apertus	Step = $0.0476$ "  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The aperture from $+5.4$ " (LP5) to $+3.5$ re step => $XAPER=0$ steps	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0	QESIPARM XSTEF S 40	t in Visit 01  Sequence 6-7 Non-In	[==>]  0 Secs (0 Secs)	
XAP. XSTI  5  Com. SQL  6  Com. So, (	ER = 21 stepsEPS is not red Wave_LP5_  ments: Expos needed to by. Ap_move_L P2 ments: In this 3.5-3.5)"/0.04 version is	s per arcsec or 1 s quired for first ape WAVE  were at +5.4" -pass calibration NONE s exposure we mov	Step = $0.0476$ "  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The aperture from $+5.4$ " (LP5) to $+3.5$ re step => $XAPER=0$ steps	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0	QESIPARM XSTEF S 40	t in Visit 01  Sequence 6-7 Non-In	[==>]  0 Secs (0 Secs)	
ComsQL  ConvXAP.	ER = 21 steps: EPS is not red Wave_LP5_  1  ments: Expos needed to by: Ap_move_L P2  ments: In this 3.5-3.5)"/0.04 version is ER = 21 steps:	s per arcsec or 1 s quired for first ape WAVE  wre at +5.4" -pass calibration NONE s exposure we mov 476 arcsec/apertus s per arcsec or 1 s	Step = $0.0476$ "  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The aperture from $+5.4$ " (LP5) to $+3.5$ re step => $XAPER=0$ steps	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0 as are defined as being at	QESIPARM XSTEF S 40 2 LP2.	t in Visit 01  Sequence 6-7 Non-In t in Visit 01	[==>]  0 Secs (0 Secs) [==>]	
XAP.	ER = 21 steps: EPS is not red Wave_LP5_  1  ments: Expos needed to by: Ap_move_L P2  ments: In this 3.5-3.5)"/0.04 version is ER = 21 steps:	s per arcsec or 1 s quired for first ape WAVE  wre at +5.4" -pass calibration NONE s exposure we mov 476 arcsec/apertus s per arcsec or 1 s	step = $0.0476$ "  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The the aperture from $+5.4$ " (LP5) to $+3.5$ are step = $0.0476$ "  Step = $0.0476$ "	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0 as are defined as being at	QESIPARM XSTEF S 40 2 LP2.	t in Visit 01  Sequence 6-7 Non-In t in Visit 01	[==>]  0 Secs (0 Secs) [==>]	
ComsQL  ConvXAP.	ER = 21 steps: EPS is not red Wave_LP5_  1  ments: Expos needed to by: Ap_move_L P2  ments: In this 3.5-3.5)"/0.04 version is ER = 21 steps:	s per arcsec or 1 s quired for first ape WAVE  wre at +5.4" -pass calibration NONE s exposure we mov 476 arcsec/apertus s per arcsec or 1 s	step = $0.0476$ "  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The the aperture from $+5.4$ " (LP5) to $+3.5$ are step = $0.0476$ "  Step = $0.0476$ "	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0 as are defined as being at	QESIPARM XSTEF S 40 2 LP2.	t in Visit 01  Sequence 6-7 Non-In t in Visit 01	[==>]  0 Secs (0 Secs) [==>]	
ComsQL  ConvXAP.	ER = 21 steps: EPS is not red Wave_LP5_  1  ments: Expos needed to by: Ap_move_L P2  ments: In this 3.5-3.5)"/0.04 version is ER = 21 steps:	s per arcsec or 1 s quired for first ape WAVE  wre at +5.4" -pass calibration NONE s exposure we mov 476 arcsec/apertus s per arcsec or 1 s	step = $0.0476$ "  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The the aperture from $+5.4$ " (LP5) to $+3.5$ are step = $0.0476$ "  Step = $0.0476$ "	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0 as are defined as being at	QESIPARM XSTEF S 40 2 LP2.	t in Visit 01  Sequence 6-7 Non-In t in Visit 01	[==>]  0 Secs (0 Secs) [==>]	
ComsQL  ConvXAP.	ER = 21 steps: EPS is not red Wave_LP5_  1  ments: Expos needed to by: Ap_move_L P2  ments: In this 3.5-3.5)"/0.04 version is ER = 21 steps:	s per arcsec or 1 s quired for first ape WAVE  wre at +5.4" -pass calibration NONE s exposure we mov 476 arcsec/apertus s per arcsec or 1 s	step = $0.0476$ "  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The the aperture from $+5.4$ " (LP5) to $+3.5$ are step = $0.0476$ "  Step = $0.0476$ "	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0 as are defined as being at	QESIPARM XSTEF S 40 2 LP2.	t in Visit 01  Sequence 6-7 Non-In t in Visit 01	[==>]  0 Secs (0 Secs) [==>]	[1]
ComsQL  ConvXAP.	ER = 21 steps: EPS is not red Wave_LP5_  1  ments: Expos needed to by: Ap_move_L P2  ments: In this 3.5-3.5)"/0.04 version is ER = 21 steps:	s per arcsec or 1 s quired for first ape WAVE  wre at +5.4" -pass calibration NONE s exposure we mov 476 arcsec/apertus s per arcsec or 1 s	step = $0.0476$ "  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The the aperture from $+5.4$ " (LP5) to $+3.5$ are step = $0.0476$ "  Step = $0.0476$ "	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0 as are defined as being at	QESIPARM XSTEF S 40 2 LP2.	t in Visit 01  Sequence 6-7 Non-In t in Visit 01	[==>]  0 Secs (0 Secs) [==>]	
ComsQL  ConvXAP.	ER = 21 steps: EPS is not red Wave_LP5_  1  ments: Expos needed to by: Ap_move_L P2  ments: In this 3.5-3.5)"/0.04 version is ER = 21 steps:	s per arcsec or 1 s quired for first ape WAVE  wre at +5.4" -pass calibration NONE s exposure we mov 476 arcsec/apertus s per arcsec or 1 s	step = $0.0476$ "  COS/FUV, TIME-TAG, WCA  COS, ALIGN/APER  The the aperture from $+5.4$ " (LP5) to $+3.5$ are step = $0.0476$ "  Step = $0.0476$ "	G160M 1577 A	FLASH=S0200D050; ; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2  XAPER=0; YAPER=0 as are defined as being at	QESIPARM XSTEF S 40 2 LP2.	t in Visit 01  Sequence 6-7 Non-In t in Visit 01	[==>]  0 Secs (0 Secs) [==>]	

	pass calibration		1577 A	; FP-POS=4;		t in Visit 01	[==>]	
QL needed to by-p Ap_move_+ 5.4 Comments: In this	pass calibration			SEGMENT=A; LIFETIME-POS=L P2				[1]
5.4 Comments: In this	NONE							
Comments: In this	NUNE	COS, ALIGN/APER		XAPER=-40;	QESIPARM XSTEP	Sequence 8-9 Non-In	0 Secs (0 Secs)	
				YAPER=0	S -40	t in Visit 01	[==>]	[2]
, ( ,		the aperture from $+3.5"$ (LP2) to $+5.4"$ . step => XAPER= $-40$ steps						
Conversion is YAPER = 21 steps	per arcsec or 1 step	p = 0.0476"						
	40. *HOWEVER*,	because of the TRANS rules, the "QES.	PARM XSTEPS -4	40" [(-40 - 0) = -40] Specie	al Requirement is nece.	ssary to move the apert	ure to the correct location.	
Wave_LP5_	WAVE	COS/FUV, TIME-TAG, WCA	G160M	FLASH=S0200D050		Sequence 8-9 Non-In	1000 Secs (1000 Secs)	
2			1577 A	; ED DOG 4.		t in Visit 01	[==>]	
				FP-POS=4; SEGMENT=A;				[2]
				LIFETIME-POS=L P2				
Comments: Exposu QL needed to by- <sub>l</sub>				12				
0 Ap_move_L P2	NONE	COS, ALIGN/APER		XAPER=0;	QESIPARM XSTEP S 40	Sequence 10-11 Non -Int in Visit 01	0 Secs (0 Secs)	
P2			YAPER=0	YAPER=0			[==>]	[2]
Conversion is IAPER = 21 steps	per arcsec or 1 step	step => $XAPER = 0$ steps $p = 0.0476$ " ecause of the TRANS rules, the "QESIP"	ARM XSTEPS +40	)" [(040) = +40] Specia	ıl Requirement is neces	ssary to move the aperti	ure to the correct location.	
1 Wave_LP2_	WAVE	COS/FUV, TIME-TAG, WCA	G160M	FLASH=S0200D050			1000 Secs (1000 Secs)	
3			1577 A	; ED DOS 4.		-Int in Visit 01	[==>]	
				FP-POS=4; SEGMENT=A:				[2]
				LIFETIME-POS=L				[2]
Comments: Exposu QL needed to by- <sub>1</sub>				P2				
2 Ap_move_+		COS, ALIGN/APER		XAPER=-40;	QESIPARM XSTEP	Sequence 12-13 Non	0 Secs (0 Secs)	
5.4				YAPER=0	S -40	-Int in Visit 01	[==>]	[2]
Comments: In this o, (5.4-3.5)"/0.042	exposure we move t 6 arcsec/aperture s	the aperture from $+3.5$ " (LP2) to $+5.4$ ". step => XAPER= $-40$ steps						
Conversion is CAPER = 21 steps	per arcsec or 1 step	o = 0.0476"						
APER is set to =	40. *HOWEVER*.	because of the TRANS rules, the "OES.	IPARM XSTEPS -4	40" [(-40 - 0) = -401 Specia	al Requirement is nece.	ssary to move the apert	ure to the correct location.	

Wave_LP5_ WAVE	COS/FUV, TIME-TAG, WCA	G160M	FLASH=S0200D050		Sequence 12-13 Non	1000 Secs (1000 Secs)	
3		1577 A	; FP-POS=4; SEGMENT=A; LIFETIME-POS=L P2		-Int in Visit 01	[==>]	[2]
Comments: Exposure at +5.4" SQL needed to by-pass calibration							·
4 Ap_move_L NONE	COS, ALIGN/APER		XAPER=0;		Sequence 14-15 Non	0 Secs (0 Secs)	
PŽ			YAPER=0	S 40	-Int in Visit 01	[==>]	[2]
Comments: In this exposure we mov So, (3.5-3.5)"/0.0476 arcsec/apertu	ve the aperture from +5.4" (LP5) to +3.5' re step => XAPER= 0 steps	' (LP2). Observatio	ons are defined as being at	LP2.			
Conversion is XAPER = 21 steps per arcsec or 1 s	step = 0.0476"						
	, because of the TRANS rules, the "QESII	PARM XSTEPS +40	0" [(040) = +40] Specia	al Requirement is neces	sary to move the apert	ure to the correct location.	
15 Wave_LP2_ WAVE	COS/FUV, TIME-TAG, WCA	G160M	FLASH=S0200D050		Sequence 14-15 Non	1000 Secs (1000 Secs)	
4		1577 A	; FP-POS=4;		-Int in Visit 01	[==>]	
			SEGMENT=A;				[2]
			LIFETIME-POS=L P2				
Comments: Exposure at LP2 SQL needed to by-pass calibration			rz				ļ
6 Ap_move_+ NONE	COS, ALIGN/APER		XAPER=-40;		Sequence 16-17 Non 0 Secs (0 Secs)	0 Secs (0 Secs)	
5.4			YAPER=0	S -40	-Int in Visit 01	[==>]	[2]
So, (5.4-3.5)"/0.0476 arcsec/apertu Conversion is XAPER = 21 steps per arcsec or 1 s 			40" [(-40 - 0) = -40] Specie	al Requirement is nece	ssary to move the apert	ure to the correct location.	
7 Wave_LP5_ WAVE	COS/FUV, TIME-TAG, WCA	G160M	FLASH=S0200D050		Sequence 16-17 Non		
4		1577 A	;		-Int in Visit 01	[==>]	
			FP-POS=4; SEGMENT=A;				[2]
			LIFETIME-POS=L				[2]
			P2				
Comments: Exposure at +5.4"  SQL needed to by-pass calibration							
8 Ap_move_L NONE	COS, ALIGN/APER		XAPER=0;		Sequence 18-19 Non -Int in Visit 01		
P2			YAPER=0	S 40		[==>]	[3]
ammonta. In this armosura wa ma	ve the aperture from +5.4" (LP5) to +3.5" re step => XAPER= 0 steps	' (LP2). Observatio	ons are defined as being at	LP2.			
So, (3.5-3.5)"/0.0476 arcsec/apertu	I						

Proposal 16052 - Visit 01 - Testing for Systematics When Moving the COS Aperture Block 19 Wave\_LP2\_ WAVE COS/FUV, TIME-TAG, WCA FLASH=S0200D050 1000 Secs (1000 Secs) G160M Sequence 18-19 Non -Int in Visit 01 1577 A *[==>1* FP-POS=4; SEGMENT=A; [3] LIFETIME-POS=L Comments: Exposure at LP2 SQL needed to by-pass calibration Ap\_move\_+ NONE COS, ALIGN/APER XAPER=-40; QESIPARM XSTEP Sequence 20-21 Non | 0 Secs (0 Secs) S -40 -Int in Visit 01 YAPER=0 f = = > 1[3] Comments: In this exposure we move the aperture from +3.5" (LP2) to +5.4". So, (5.4-3.5)"/0.0476 arcsec/aperture step => XAPER= -40 steps Conversion is XAPER = 21 steps per arcsec or 1 step = 0.0476" XAPER is set to = -40. \*HOWEVER\*, because of the TRANS rules, the "QESIPARM XSTEPS -40" [(-40 - 0) = -40] Special Requirement is necessary to move the aperture to the correct location. Wave\_LP5\_ WAVE COS/FUV, TIME-TAG, WCA FLASH=S0200D050 Sequence 20-21 Non | 1000 Secs (1000 Secs) G160M -Int in Visit 01 1577 A [==>] FP-POS=4; SEGMENT=A; [3] LIFETIME-POS=L P2

Comments: Exposure at +5.4" SOL needed to by-pass calibration



