

12678 - COS/FUV Characterization of Optical Effects

Cycle: 18, Proposal Category: CAL/COS (Availability Mode: RESTRICTED)

INVESTIGATORS

Name	Institution	E-Mail
Dr. David J. Sahnow (PI)	The Johns Hopkins University	sahnow@pha.jhu.edu
Dr. Cristina Oliveira (CoI)	Space Telescope Science Institute	oliveira@stsci.edu
Dr. Derck L. Massa (CoI)	Space Telescope Science Institute	massa@stsci.edu
Dr. Steven Osterman (CoI)	University of Colorado at Boulder	steven.osterman@colorado.edu
Dr. Steven V. Penton (CoI)	University of Colorado at Boulder	steven.penton@colorado.edu
Dr. Alessandra Aloisi (CoI)	Space Telescope Science Institute	aloisi@stsci.edu
Dr. Charles R. Proffitt (CoI)	Computer Sciences Corporation	proffitt@stsci.edu

VISITS

Visit	Targets used in Visit	Configurations used in Visit	Orbits Used		OP Current with Visit?
01	(1) SK191 NONE	COS COS/FUV	2	14-Oct-2011 21:07:10.0	yes
02	(1) SK191 NONE	COS COS/FUV	2	14-Oct-2011 21:07:38.0	yes
11	(1) SK191 NONE	COS COS/FUV	2	14-Oct-2011 21:08:00.0	yes

6 Total Orbits Used

ABSTRACT

Proposal 12678 (STScI Edit Number: 2, Created: Friday, October 14, 2011 8:08:14 PM EST) - Overview

This program will obtain COS FUV spectra of external targets at a range of cross-dispersion and dispersion positions in order to evaluate the optical performance of the spectrograph at different lifetime positions. Changes to throughput, resolution, gain, rotation, etc. as a function of position will be measured and compared to raytrace models. The data obtained in this program will be used, along with that from programs 12676 and 12677, to determine which positions are suitable for future science operations.

Initially (the first three visits), data will be collected at only G130M/1291, using all FP-POS positions. Followup observations may be made with the other FUV gratings once the initial results are examined.

OBSERVING DESCRIPTION

STRUCTURE:

This program curently consists of three two-orbit visits:

01 - G130M/1291

with (cross-dispersion, dispersion) = (0.0,0.0), $(-3.0^{\circ},0.0)$, $(-6.0^{\circ},0.0)$

02 - G130M/1291 with (cross-dispersion, dispersion) = (0.0,0.0), (+3.0",0.0), (+6.0,0.0)

11 - G130M/1291 with (cross-dispersion, dispersion) = (0.0,0.0), (-3.0",-3.0"), (-3.0,+2.0")

More visits will likely be added once the initial data is evaluated.

Each visit follows the same pattern:

- 1. Perform an acquisition.
- 2. Take an exposure at the nominal position at one FP-POSs.
- 3a. Move the aperture to a position corresponding to an offset in the cross-dispersion and/or dispersion direction using ALIGN/APER..

Aperture positions are specified with the YAPER (XAPER) optional parameter, using a scale of -0.0476 arcseconds per YAPER (XAPER) step.

- 3b. Take an exposure with X and Y POS TARGs corresponding to the XAPER and YAPER value in the previous step. The ELNOAPMAIN special instruction is required for every exposure after an ALIGN/APER.
- 4. Repeat steps 2, 3a and 3b for the remaining positions.

Proposal 12678 (STScI Edit Number: 2, Created: Friday, October 14, 2011 8:08:14 PM EST) - Overview

TARGET COUNT RATES:

Both targets have been previously observed, so the count rates and spectra are known.

Previous observations of SK191 in G130M had \sim 2.5 c/s/resel; G160M had similar count rates. Thus, with exposure times of 300 seconds, we will obtain S/N of 40 - 50 per resel in this proposal.

LAMP FLASHES:

At locations where program 12677 has verified that there is no light leakage from the wavecal lamp, FLASH=YES has been used. At other locations, we have used FLASH=NO.

CALIBRATION JUSTIFICATION

Optical performance of the possible lifetime positions must be evaluated before moving to a new 'permanent' position.

ADDITIONAL COMMENTS

TIMING CONSTRAINTS:

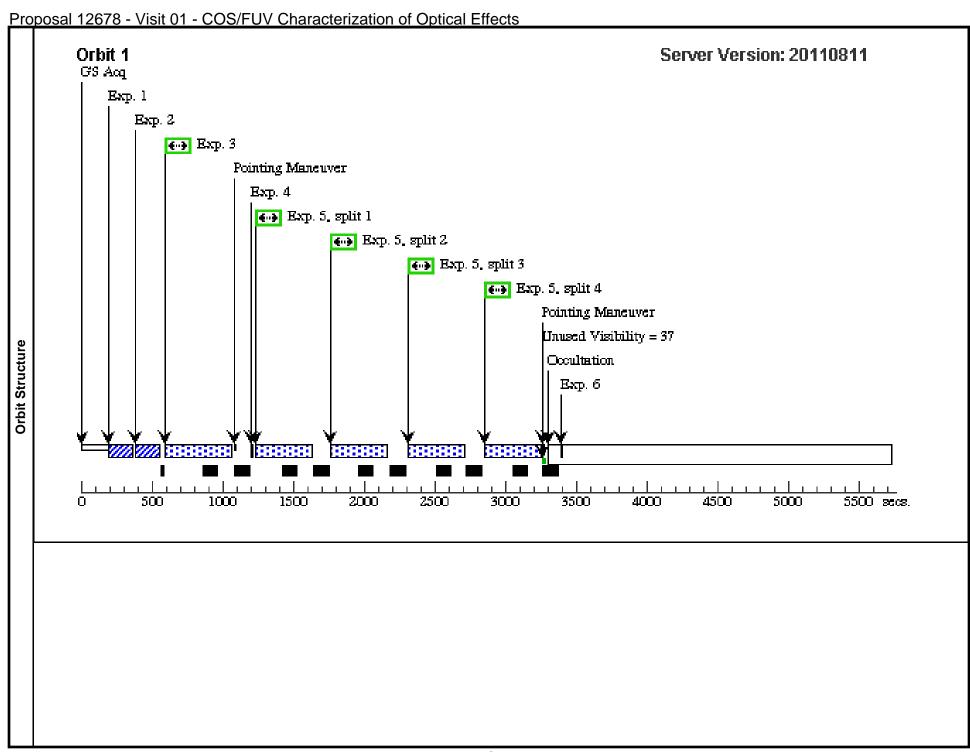
Visits 01 and 02 have no constraints, and can be scheduled as soon as possible, since FLASH is set to NO for the +/-6" cross-dispersion position. If Program 12677 has completed and the lamp is found to be safe at -6", this proposal may be modified to set FLASH=YES in that case.

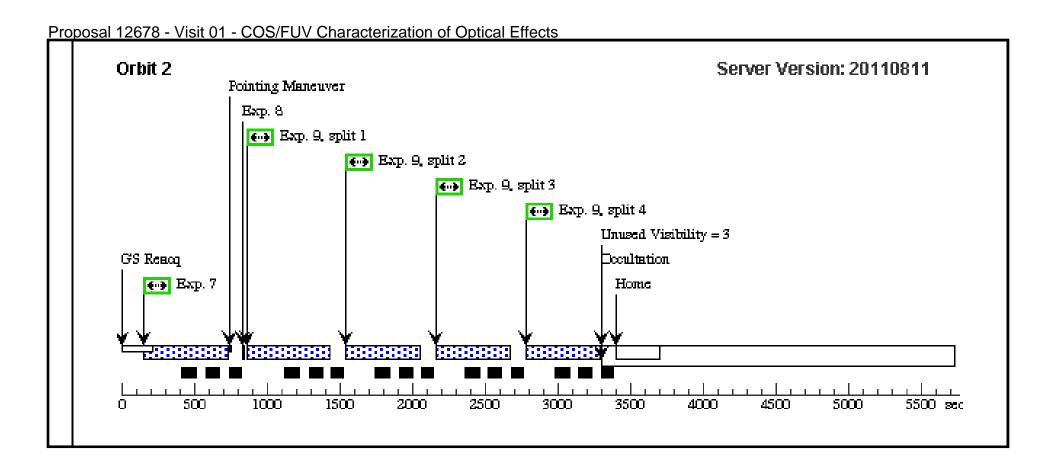
Visit 11 has no constraints since we have set FLASH=NO for the off-nominal exposures.

<u> 11</u>	<u>oposai 12678 -</u>	Visit 01 - COS/FUV Characterization	on of Optical Effects			
	Proposal 12678, Visit	01, scheduled			Sat Oct 15 01:08:15 GM	T 2011
<u>.</u> ±	Diagnostic Status: W	arning				
/is	Scientific Instruments:	COS/FUV, COS				
_	Special Requirements:	SCHED 70%				
L	Comments: G130M/12	91 at (cross-dispersion, dispersion) positions of $(0.0",0.0"$	'), (-3.0",0.0"), (-6.0",0.0")			
ı	(Visit 01) Warning (Or	bit Planner): POS TARG OUTSIDE OF APERTURE				
ı	(Visit 01) Warning (Or	bit Planner): POS TARG OUTSIDE OF APERTURE				
SS	(Visit 01) Warning (Fo	rm): If the target coordinates are not known to 0.4" (or be	tter) an ACQ/SEARCH should precede the ACQ/	PEAKXD.		
iti		bit Planner): POS TARG OUTSIDE OF APERTURE				
2	(Visit 01) Warning (Or	bit Planner): POS TARG OUTSIDE OF APERTURE				
<u>a</u>	(Visit 01) Warning (Or	bit Planner): POS TARG OUTSIDE OF APERTURE				
		bit Planner): POS TARG OUTSIDE OF APERTURE				
	(Visit 01) Warning (Or	bit Planner): POS TARG OUTSIDE OF APERTURE				
_		bit Planner): POS TARG OUTSIDE OF APERTURE				
t S	# Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	
raets	(1) SK191	RA: 01 41 42.0723 (25.4253012d)	Proper Motion RA: 3.19 mas/yr	V=11.84	Reference Frame: ICRS	
<u> </u>		Dec: -73 50 38.20 (-73.84394d)	Proper Motion Dec: -2.90 mas/yr			
۵ ا		Equinox: J2000	Epoch of Position: 1991.25			
ixed						

Proposal 12678 - Visit 01 - COS/FUV Characterization of Optical Effects

	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	G130M/129 1 ACQ/PEA KXD (0)		COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A				2 Secs [==>]	[1]
2	G130M/129 1 ACQ/PEA KD (0)		COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	NUM-POS=5; STEP-SIZE=1.0			$ \frac{2 \text{ Secs}}{I = => J} $	[1]
3	G130M/129 1/1 Exposur e at 0.0 (0)		COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=16 5; FP-POS=1; FLASH=YES	POS TARG 0.0,0.0		300 Secs [==>347.0 Secs]	[1]
4	Aperture at - 3.0 arcsec (XD) (0)	1	csec with aperture at 0.0 arcsec. COS, ALIGN/APER		XAPER=63; YAPER=0			$0.0 \operatorname{Secs}$ $I = > I$	[1]
Cor	nments: Move o	aperture to an alt	ernate lifetime position. This corresponds i	to displacement in	the cross-dispersion direc	ction of: -3.0 arcsec	(63 x -0.0476)		•
5 Сон 6	G130M/129 1/ALL Expo sure at -3.0 (XD) (0)		COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=16 5; FP-POS=ALL; FLASH=YES	POS TARG 0.0,-3.0 SPEC COM INSTR ELNOAPMAIN	- 7	300 Secs [==>347.0 Secs (Split 1)] [==>347.0 Secs (Split 2)] [==>347.0 Secs (Split 3)] [==>347.0 Secs (Split 4)]	[1]
Cor		1	arcsec with aperture at -3.0 arcsec.		VADED O			0.0 Secs	
6	Aperture at 0.0 arcsec (XD)	NONE	COS, ALIGN/APER		XAPER=0; YAPER=0			[==>]	[1]
Cor	nments: Move c	aperture back to r	nominal position.						<u>'</u>
7	G130M/129 1/3 Exposur e at 0.0 (0)		COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=16 5; FP-POS=3; FLASH=YES	POS TARG 0.0,0.0 SPEC COM INSTR ELNOAPMAIN		300 Secs [==>456.0 Secs]	[2]
Cor			csec with aperture at 0.0 arcsec.						
8	Aperture at - 6.0 arcsec (XD) (0)	NONE	COS, ALIGN/APER		XAPER=126; YAPER=0			0.0 Secs [==>]	[2]
Cor	nments: Move a	aperture to an alt	ernate lifetime position. This corresponds i	to displacement in	the cross-dispersion direc	ction of: -6.0 arcsec	(126 x -0.0476)		
9	G130M/129 1/ALL Expo sure at -6.0 (XD) (0)	` /	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=16 5; FP-POS=ALL; FLASH=NO;	POS TARG 0.0,-6.0 SPEC COM INSTR ELNOAPMAIN		300 Secs [==>456.0 Secs (Split 1)] [==>456.0 Secs (Split 2)] [==>456.0 Secs (Split 3)]	[2]

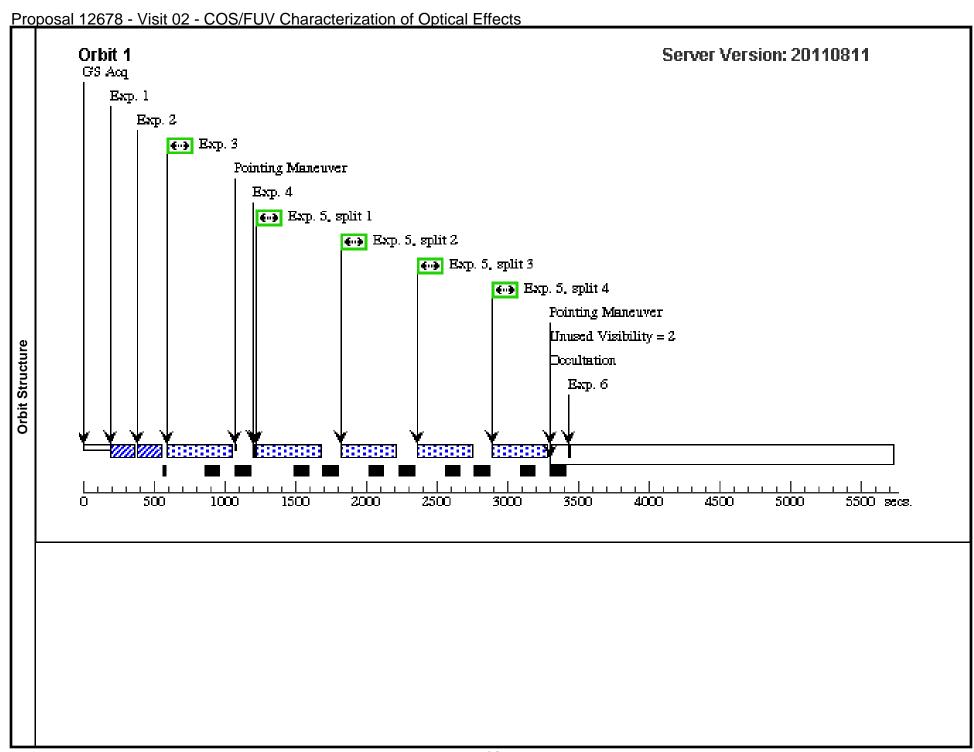


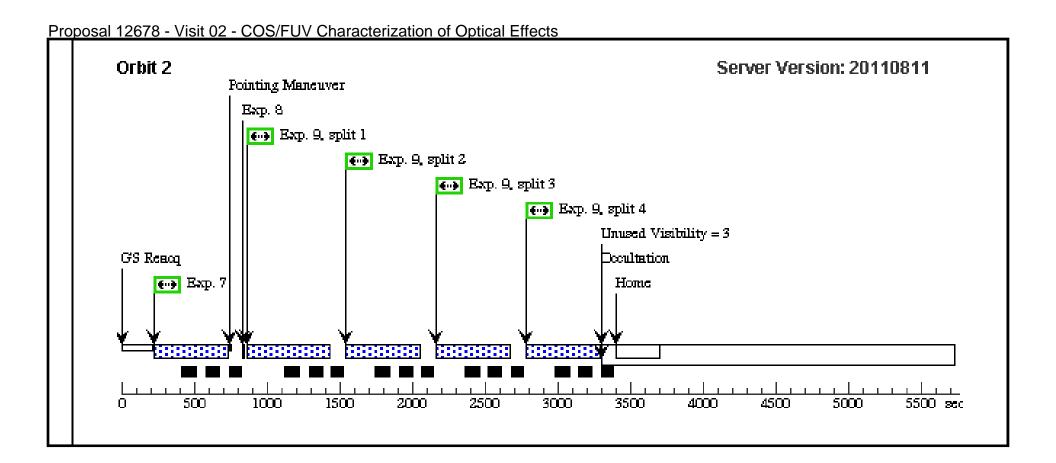


<u> </u>	<u> </u>	t 02 - COS/FUV Characterization	n oi Opticai Effects		
1	Proposal 12678, Visit 02, scl	neduled			Sat Oct 15 01:08:18 GMT 2011
<u>.</u>	Diagnostic Status: Warning				
Vis	Scientific Instruments: COS/I	FUV, COS			
1	Special Requirements: SCHE	D 70%			
	Comments: G130M/1291 at (cross-dispersion, dispersion) positions of (0.0",0.0"),	(+3.0",0.0"), (+6.0",0.0")		
	(Visit 02) Warning (Orbit Pla	nner): POS TARG OUTSIDE OF APERTURE			
1	(Visit 02) Warning (Orbit Pla	nner): POS TARG OUTSIDE OF APERTURE			
SS	(Visit 02) Warning (Orbit Pla	nner): POS TARG OUTSIDE OF APERTURE			
sti	(Visit 02) Warning (Form): If	the target coordinates are not known to 0.4" (or bette	er) an ACQ/SEARCH should precede the ACQ/	PEAKXD.	
12		nner): POS TARG OUTSIDE OF APERTURE			
iag	(Visit 02) Warning (Orbit Pla	nner): POS TARG OUTSIDE OF APERTURE			
ן≌		nner): POS TARG OUTSIDE OF APERTURE			
	(Visit 02) Warning (Orbit Pla	nner): POS TARG OUTSIDE OF APERTURE			
	(Visit 02) Warning (Orbit Pla	nner): POS TARG OUTSIDE OF APERTURE			
ts	# Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
rgets	(1) SK191	RA: 01 41 42.0723 (25.4253012d)	Proper Motion RA: 3.19 mas/yr	V=11.84	Reference Frame: ICRS
ᇗ		Dec: -73 50 38.20 (-73.84394d)	Proper Motion Dec: -2.90 mas/yr		
۵ ا		Equinox: J2000	Epoch of Position: 1991.25		
-ixed					

Proposal 12678 - Visit 02 - COS/FUV Characterization of Optical Effects

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbi
1	G130M/129 1 ACQ/PEA KXD (0)	(1) SK191	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A				2 Secs [==>]	[1]
2	G130M/129 1 ACQ/PEA KD (0)	(1) SK191	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	NUM-POS=5; STEP-SIZE=1.0			2 Secs [==>]	[1]
3	G130M/129 1/2 Exposur e at 0.0 (0)	,	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=16 5; FP-POS=2; FLASH=YES	POS TARG 0.0,0.0		300 Secs [==>340.0 Secs]	[1]
4	Aperture at +3.0 arcsec (XD) (0)	1	csec with aperture at 0.0 arcsec. COS, ALIGN/APER		XAPER=-63; YAPER=0			0.0 Secs [==>]	[1]
5	G130M/129 1/ALL Expo sure at +3.0 (XD) (0)	(1) SK191	ernate lifetime position. This corresponds COS/FUV, TIME-TAG, PSA arcsec with aperture at +3.0 arcsec.	to displacement in t G130M 1291 A	the cross-dispersion direct BUFFER-TIME=16 5; FP-POS=ALL; FLASH=YES		,	300 Secs [==>340.0 Secs (Split 1)] [==>340.0 Secs (Split 2)] [==>340.0 Secs (Split 3)] [==>340.0 Secs (Split 4)]	[1]
6	Aperture at 0.0 arcsec (XD) (0)	•	COS, ALIGN/APER		XAPER=0; YAPER=0			$0.0 \operatorname{Secs}$ $[==>]$	[1]
Con	nments: Move a	perture back to i	nominal position.						·
7	G130M/129 1/4 Exposur e at 0.0 (0)	(1) SK191	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=16 5; FP-POS=4; FLASH=YES	POS TARG 0.0,0.0 SPEC COM INSTF ELNOAPMAIN		300 Secs [==>456.0 Secs]	[2]
Con	nments: FUV E	xposure at 0.0 ar	csec with aperture at 0.0 arcsec.						
8	Aperture at +6.0 arcsec (XD) (0)	NONE	COS, ALIGN/APER		XAPER=-126; YAPER=0			0.0 Secs [==>]	[2]
Con			ernate lifetime position. This corresponds		,		·	Tanan	
9	G130M/129 1/ALL Expo sure at +6.0 (XD) (0)	(1) SK191	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=16 5; FP-POS=ALL; FLASH=NO; WAVECAL=NO	POS TARG 0.0,6.0 SPEC COM INSTR ELNOAPMAIN		300 Secs [==>456.0 Secs (Split 1)] [==>456.0 Secs (Split 2)] [==>456.0 Secs (Split 3)]	[2]





	Proposal 12678 -	- Visit 11 - COS/FUV	Characterization of Optical Effects
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<u> Pr</u>	<u>oposal 12678 - Visi</u>	<u>t 11 - COS/FUV Characterization</u>	n of Optical Effects		
	Proposal 12678, Visit 11				Sat Oct 15 01:08:20 GMT 2011
l. <u>±</u>	Diagnostic Status: Warning	.			
ij	Scientific Instruments: COS/	FUV, COS			
[Special Requirements: SCHE	ED 80%			
	Comments: G130M/1291 at (cross-dispersion, dispersion) positions of (0.0",0.0"),	(-3.0",-3.0"), (-3.0",+2.0")		
	(Visit 11) Warning (Orbit Pla	nner): POS TARG OUTSIDE OF APERTURE			
ı	(Visit 11) Warning (Orbit Pla	nner): POS TARG OUTSIDE OF APERTURE			
ď	(Visit 11) Warning (Form): I	f the target coordinates are not known to 0.4" (or bette	er) an ACQ/SEARCH should precede the ACQ/I	PEAKXD.	
ij		nner): POS TARG OUTSIDE OF APERTURE			
2	(Visit 11) Warning (Orbit Pla	nner): POS TARG OUTSIDE OF APERTURE			
<u>2</u>	(Visit 11) Warning (Orbit Pla	nner): POS TARG OUTSIDE OF APERTURE			
=		nner): POS TARG OUTSIDE OF APERTURE			
ı	(Visit 11) Warning (Orbit Pla	nner): POS TARG OUTSIDE OF APERTURE			
L		nner): POS TARG OUTSIDE OF APERTURE			
Ų.	# Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
raets	(1) SK191	RA: 01 41 42.0723 (25.4253012d)	Proper Motion RA: 3.19 mas/yr	V=11.84	Reference Frame: ICRS
12		Dec: -73 50 38.20 (-73.84394d)	Proper Motion Dec: -2.90 mas/yr		
7		Equinox: J2000	Epoch of Position: 1991.25		
i v					

Proposal 12678 - Visit 11 - COS/FUV Characterization of Optical Effects

	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	G130M/129	(1) SK191	COS/FUV, ACQ/PEAKXD, PSA	G130M				2 Secs	
	1 ACQ/PEA KXD (0)			1291 A				[==>]	[1]
2	G130M/129	(1) SK191	COS/FUV, ACQ/PEAKD, PSA	G130M	NUM-POS=5;			2 Secs	
	1 ACQ/PEA KD (0)			1291 A	STEP-SIZE=1.0			[==>]	[1]
3	G130M/129	(1) SK191	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=16	POS TARG 0.0,0.0		300 Secs	
	1/1 Exposur e at 0.0			1291 A	5;			[==>]	
	(0)				FP-POS=1; FLASH=YES				[1]
Com			csec with aperture at 0.0 arcsec.						
4	Aperture at -	NONE	COS, ALIGN/APER		XAPER=63;			0.0 Secs	
	3.0 arcsec (XD), -3.0 ar				YAPER=-63			I = => J	
	csec (D) (0)								[1]
Com 6).	nments: Move o	aperture to an alte	ernate lifetime position. This corresponds	to displacement in i	he cross-dispersion direc	ction of: -3.0 arcsec (163 x -0.0476), and	l in the dispersion direction of: -3.0 arc	sec (-63 x 0.0
5	G130M/129	(1) SK191	COS/FUV, TIME-TAG, PSA	G130M	BUFFER-TIME=16	POS TARG -3.0,-3.	0	335 Secs	
	1/ALL Expo sure at -3.0 (1291 A	5;	;		$[==>(Split\ 1)]$	
					FP-POS=ALL;	SPEC COM INSTR ELNOAPMAIN		$[==>(Split\ 2)]$	[1]
	XD), -3.0 (D								1 /1
)				FLASH=NO;			$[==>(Split\ 3)]$	1 1
	XD), -3.0 (D) (0)				WAVECAL=NO			[==>(Split 3)] $[==>(Split 4)]$	
Com FLA) (0) nments: FUV E	Exposures at (-3.0,	, -3.0) arcsec (XD,D) with aperture at (-3. ispersion locations.	0, -3.0) arcsec.	*				
Com FLA 6) (0) ments: FUV E SH set to NO c Aperture at	Exposures at (-3.0, at non-standard d	, -3.0) arcsec (XD,D) with aperture at (-3. ispersion locations. COS, ALIGN/APER	0, -3.0) arcsec.	*				
Com FLA 6) (0) nments: FUV E SH set to NO c	Exposures at (-3.0, at non-standard d	ispersion locations.	0, -3.0) arcsec.	WAVECAL=NO			$[==>(Split\ 4)]$	
<i>FLA</i> 6) (0) ments: FUV E SH set to NO of Aperture at 0.0 arcsec (XD) (0)	Exposures at (-3.0, at non-standard d	ispersion locations. COS, ALIGN/APER	0, -3.0) arcsec.	WAVECAL=NO XAPER=0;			[==>(Split 4)] 0.0 Secs	[1]
<i>FLA</i> 6) (0) ments: FUV E SH set to NO o Aperture at 0.0 arcsec (XD) (0) ments: Move o G130M/129	Exposures at (-3.0, at non-standard d NONE aperture back to n	ispersion locations. COS, ALIGN/APER	0, -3.0) arcsec.	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16	POS TARG 0.0,0.0;		[==>(Split 4)] 0.0 Secs	
<i>FLA</i> 6) (0) ments: FUV E SH set to NO of Aperture at 0.0 arcsec (XD) (0) ments: Move of G130M/129 1/3 Exposur	Exposures at (-3.0, at non-standard d NONE aperture back to n	ispersion locations. COS, ALIGN/APER nominal position.		WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5;	SPEC COM INSTR		[I = > (Split 4)] $0.0 Secs$ $[I = > J]$	
<i>FLA</i> 6) (0) ments: FUV E SH set to NO o Aperture at 0.0 arcsec (XD) (0) ments: Move o G130M/129	Exposures at (-3.0, at non-standard d NONE aperture back to n	ispersion locations. COS, ALIGN/APER nominal position.	G130M	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5; FP-POS=3;			[==>(Split 4)] $0.0 Secs$ $[==>]$ $300 Secs$	
FLA 6 Com 7) (0) ments: FUV E SH set to NO of Aperture at 0.0 arcsec (XD) (0) ments: Move of G130M/129 1/3 Exposur e at 0.0 (0)	Exposures at (-3.0, at non-standard d NONE NONE aperture back to n (1) SK191	cOS, ALIGN/APER nominal position. COS/FUV, TIME-TAG, PSA	G130M	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5;	SPEC COM INSTR		[==>(Split 4)] $0.0 Secs$ $[==>]$ $300 Secs$	[1]
FLA 6 Com 7) (0) ments: FUV E SH set to NO of Aperture at 0.0 arcsec (XD) (0) ments: Move of G130M/129 1/3 Exposur e at 0.0 (0)	Exposures at (-3.0, at non-standard d NONE Apperture back to n (1) SK191 Exposure at 0.0 ar	csec with aperture at 0.0 arcsec.	G130M	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5; FP-POS=3; FLASH=YES	SPEC COM INSTR		[I = > (Split 4)] $0.0 Secs$ $[I = > J]$ $300 Secs$ $[I = > J]$	[1]
FLA 6 Com 7) (0) ments: FUV E SH set to NO c Aperture at 0.0 arcsec (XD) (0) ments: Move c G130M/129 1/3 Exposur e at 0.0 (0) ments: FUV E Aperture at	Exposures at (-3.0, at non-standard d NONE Apperture back to n (1) SK191 Exposure at 0.0 ar	cOS, ALIGN/APER nominal position. COS/FUV, TIME-TAG, PSA	G130M	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5; FP-POS=3; FLASH=YES XAPER=63;	SPEC COM INSTR		[l] = >(Split 4)] $0.0 Secs$ $[l] = > J$ $300 Secs$ $[l] = > J$ $0.0 Secs$	[1]
FLA 6 Com 7) (0) mments: FUV E SH set to NO of Aperture at 0.0 arcsec (XD) (0) mments: Move of G130M/129 1/3 Exposur e at 0.0 (0) mments: FUV E Aperture at 3.0 arcsec (XD), +2.0 ar csec (D)	Exposures at (-3.0, at non-standard de NONE Superture back to reconstruction (1) SK191 Exposure at 0.0 are NONE	csec with aperture at 0.0 arcsec.	G130M	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5; FP-POS=3; FLASH=YES	SPEC COM INSTR		[I = > (Split 4)] $0.0 Secs$ $[I = > J]$ $300 Secs$ $[I = > J]$	[2]
FLA6Com7Com8) (0) mments: FUV E SH set to NO of Aperture at 0.0 arcsec (XD) (0) mments: Move of G130M/129 1/3 Exposur e at 0.0 (0) mments: FUV E Aperture at 3.0 arcsec (XD), +2.0 ar csec (D) (0)	Exposures at (-3.0, at non-standard d) NONE Aperture back to n (1) SK191 Exposure at 0.0 ar NONE	csec with aperture at 0.0 arcsec.	G130M 1291 A	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5; FP-POS=3; FLASH=YES XAPER=63; YAPER=42	SPEC COM INSTR ELNOAPMAIN		[l] = >(Split 4)] $0.0 Secs$ $[l] = > J$ $300 Secs$ $[l] = > J$ $0.0 Secs$ $[l] = > J$	[2]
FLA 6 Com 7 Com 8	ments: FUV E SH set to NO of Aperture at 0.0 arcsec (XD) (0) ments: Move of G130M/129 1/3 Exposur e at 0.0 (0) ments: FUV E Aperture at 3.0 arcsec (XD), +2.0 ar csec (D) ments: Move of	Exposures at (-3.0, at non-standard de NONE Aperture back to re (1) SK191 Exposure at 0.0 are NONE	cosc with aperture at 0.0 arcsec. COS, ALIGN/APER cosc with aperture at 0.0 arcsec. COS, ALIGN/APER	G130M 1291 A to displacement in a	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5; FP-POS=3; FLASH=YES XAPER=63; YAPER=42	SPEC COM INSTR ELNOAPMAIN	63 x -0.0476), and	[l] = >(Split 4)] $0.0 Secs$ $[l] = > J$ $0.0 Secs$ $[l] = > J$ $0.0 Secs$ $[l] = > J$ $l in the dispersion direction of: +2.0 are$	[2]
FLA6Com7Com8) (0) mments: FUV E SH set to NO c Aperture at 0.0 arcsec (XD) (0) mments: Move c G130M/129 1/3 Exposur e at 0.0 (0) mments: FUV E Aperture at 3.0 arcsec (XD), +2.0 ar csec (D) (0) mments: Move c G130M/129 1/ALL Expo	Exposures at (-3.0, at non-standard de NONE Aperture back to re (1) SK191 Exposure at 0.0 are NONE	cosc with aperture at 0.0 arcsec.	G130M 1291 A to displacement in a	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5; FP-POS=3; FLASH=YES XAPER=63; YAPER=42	SPEC COM INSTR ELNOAPMAIN ction of: -3.0 arcsec (POS TARG 2.0,-3.0	63 x -0.0476), and	[I = > (Split 4)] $0.0 Secs$ $[I = >]$ $300 Secs$ $[I = >]$ $0.0 Secs$ $[I = >]$ $I in the dispersion direction of: +2.0 are 450 Secs$	[2]
FLA 6 Com 7 Com 8	ments: FUV E SH set to NO of Aperture at 0.0 arcsec (XD) (0) ments: Move of G130M/129 1/3 Exposur e at 0.0 (0) ments: FUV E Aperture at 3.0 arcsec (XD), +2.0 ar csec (D) (0) ments: Move of G130M/129 1/ALL Expo sure at -3.0 (Exposures at (-3.0, at non-standard de NONE Aperture back to re (1) SK191 Exposure at 0.0 are NONE	cosc with aperture at 0.0 arcsec. COS, ALIGN/APER cosc with aperture at 0.0 arcsec. COS, ALIGN/APER	G130M 1291 A to displacement in a	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5; FP-POS=3; FLASH=YES XAPER=63; YAPER=42	SPEC COM INSTR ELNOAPMAIN	63 x -0.0476), and	[l] = >(Split 4)] $0.0 Secs$ $[l] = > J$ $0.0 Secs$ $[l] = > J$ $0.0 Secs$ $[l] = > J$ $l in the dispersion direction of: +2.0 are dispersion direction direction$	[2] [2] [2] [2]
FLA 6 Com 7 Com 8	ments: FUV E SH set to NO of Aperture at 0.0 arcsec (XD) (0) Aments: Move of G130M/129 1/3 Exposur e at 0.0 (0) Aperture at 3.0 arcsec (XD), +2.0 arcsec (D) (0) Aments: Move of G130M/129 1/ALL Expo sure at -3.0 (XD), +2.0 (D)	Exposures at (-3.0, at non-standard de NONE Aperture back to re (1) SK191 Exposure at 0.0 are NONE	cosc with aperture at 0.0 arcsec. COS, ALIGN/APER cosc with aperture at 0.0 arcsec. COS, ALIGN/APER	G130M 1291 A to displacement in a	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5; FP-POS=3; FLASH=YES XAPER=63; YAPER=42 the cross-dispersion direction direction of the control of the cont	SPEC COM INSTR ELNOAPMAIN ction of: -3.0 arcsec (POS TARG 2.0,-3.0 SPEC COM INSTR	63 x -0.0476), and	[l] = >(Split 4)] $0.0 Secs$ $[l] = > J$ $300 Secs$ $[l] = > J$ $0.0 Secs$ $[l] = > J$ $l in the dispersion direction of: +2.0 are dispersion direction direction direction direction dispersion direction direct$	[2]
FLA 6 Com 7 Com 8	ments: FUV E SH set to NO of Aperture at 0.0 arcsec (XD) (0) ments: Move of G130M/129 1/3 Exposur e at 0.0 (0) Aperture at 3.0 arcsec (XD), +2.0 ar csec (D) (0) ments: Move of G130M/129 1/ALL Expo sure at -3.0 (XD), +2.0 (Exposures at (-3.0, at non-standard de NONE Aperture back to re (1) SK191 Exposure at 0.0 are NONE	cosc with aperture at 0.0 arcsec. COS, ALIGN/APER cosc with aperture at 0.0 arcsec. COS, ALIGN/APER	G130M 1291 A to displacement in a	WAVECAL=NO XAPER=0; YAPER=0 BUFFER-TIME=16 5; FP-POS=3; FLASH=YES XAPER=63; YAPER=42 the cross-dispersion direction direct	SPEC COM INSTR ELNOAPMAIN ction of: -3.0 arcsec (POS TARG 2.0,-3.0 SPEC COM INSTR	63 x -0.0476), and	[l] = >(Split 4)] $0.0 Secs$ $[l] = > J$ $0.0 Secs$ $[l] = > J$ $0.0 Secs$ $[l] = > J$ $l in the dispersion direction of: +2.0 are dispersion direction direction$	[2] [2] [2]

