



13115 - A High-Resolution Study of Long-Term Absorption Variation and the X-ray/UV Connection in NGC 3783

Cycle: 20, Proposal Category: GO

(Availability Mode: SUPPORTED)

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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-3783	COS/FUV	2	18-Sep-2012 21:21:32.0	yes

2 Total Orbits Used

ABSTRACT

We propose a 170 ks HETGS observation of the bright Seyfert 1 galaxy NGC 3783 to explore the new parameter space of high-resolution warm absorber (WA) variation in ionization, structure, and kinematics over 11 yr. NGC 3783 is the ideal candidate for such a long-term variation study, due to its extraordinary baseline of HETGS (from 2000-2001) and UV spectroscopy, its extremely rich absorption spectrum, and its X-ray/UV

brightness. In addition to mapping long-term WA evolution in unprecedented detail, we will assess joint X-ray/UV absorption variations over long time scales with a supporting HST COS spectrum; substantial UV variations over the past 11 yr indicate that corresponding X-ray variations should be detected and be physically informative.

Note this is an accepted joint proposal between HST COS and Chandra HETGS. As per our original Chandra proposal, we prefer that the HST and Chandra observations be conducted reasonably close together in time (within about 10 days), although we do not have a formal time constraint.

OBSERVING DESCRIPTION

Here we are essentially repeating the HST COS observations of NGC 3783 done as part of program 12212 in order to investigate variation of its intrinsic multi-component UV absorption-line system. Our new observations will complement about 30 yr of existing low-resolution and high-resolution UV spectroscopy.

One orbit with each of the medium-resolution (G160M and G130M) FUV gratings should provide a S/N of about 30 in 3 ks (based on the HST exposure-time calculator) at excellent resolution (about 16 km/s). The continuum of NGC 3783 has been consistently bright, with F_{λ} of about $4e-14$ erg/s/cm²/Å at 1470 Å (e.g., see Figure 1a of Gabel et al. 2003a), so we do not expect a low S/N for our observations. The advantages of high S/N for this observation justify the use of a second HST orbit.

Note this is an accepted joint proposal between HST COS and Chandra HETGS. As per our original Chandra proposal, we prefer that the HST and Chandra observations be conducted reasonably close together in time (within about 10 days), although we do not have a formal time constraint.

I would be happy to provide a copy of the original Chandra + HST proposal if desired. Also, Steven Penton there at STScI has a copy already, I believe.

REAL TIME JUSTIFICATION

Note this is an accepted joint proposal between HST COS and Chandra HETGS. As per our original Chandra proposal, we prefer that the HST and Chandra observations be conducted reasonably close together in time (within about 10 days), although we do not have a formal time constraint.

Proposal 13115 - Visit 01 - A High-Resolution Study of Long-Term Absorption Variation and the X-ray/UV Connection in NGC 3783

Wed Sep 19 01:21:42 GMT 2012

Visit	Proposal 13115, Visit 01, implementation Diagnostic Status: Warning Scientific Instruments: COS/FUV Special Requirements: SCHED 100%																
	(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. (Visit 01) Warning (Form): If the target coordinates are not known to 0.4" (or better) an ACQ/SEARCH should precede the ACQ/PEAKXD.																
Diagnosics																	
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-3783</td> <td>RA: 11 39 1.7208 (174.7571700d) Dec: -37 44 18.89 (-37.73858d) Equinox: J2000</td> <td></td> <td>V=12.6</td> <td>Reference Frame: ICRS</td> </tr> </tbody> </table>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	NGC-3783	RA: 11 39 1.7208 (174.7571700d) Dec: -37 44 18.89 (-37.73858d) Equinox: J2000		V=12.6	Reference Frame: ICRS				
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<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>																	

Proposal 13115 - Visit 01 - A High-Resolution Study of Long-Term Absorption Variation and the X-ray/UV Connection in NGC 3783

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time[Actual Dur.]	Orbit	
Exposures	1	(COS.sa.427 (1) NGC-3783 715)	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A				10 Secs [==>]	[1]	
	<i>Comments: Here we are essentially repeating the HST COS observations of NGC 3783 done as part of program 12212 in order to investigate variation of its intrinsic multi-component UV absorption-line system.</i>									
	<i>Previous COS observations place the target flux at $F(1280)=4.5E-14$; we used this flux to simulate the target with a composite QSO spectrum redshifted to $z=0.00973$. Total count rate on Segment A is 745 counts/s. To get $S/N=40$ on Seg A would take about 3.4s, we use 10s to ensure a good centering and allow for target variability.</i>									
	2	(COS.sa.427 (1) NGC-3783 715)	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	NUM-POS=5; CENTER=DEF; STEP-SIZE=0.9; SEGMENT=BOTH			10 Secs [==>]	[1]	
	<i>Comments: Here we are essentially repeating the HST COS observations of NGC 3783 done as part of program 12212 in order to investigate variation of its intrinsic multi-component UV absorption-line system.</i>									
	<i>Previous COS observations place the target flux at $F(1280)=4.5E-14$; we used this flux to simulate the target with a composite QSO spectrum redshifted to $z=0.00973$. Total count rate on Segment A is 745 counts/s. To get $S/N=40$ on Seg A would take about 3.4s, we use 10s to ensure a good centering and allow for target variability.</i>									
	3	(COS.sp.427 (1) NGC-3783 716)	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=36 0; FP-POS=3			460 Secs [==>]	[1]	
	<i>Comments: Here we are essentially repeating the HST COS observations of NGC 3783 done as part of program 12212 in order to investigate variation of its intrinsic multi-component UV absorption-line system.</i>									
	4	(COS.sp.427 (1) NGC-3783 716)	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=36 0; FP-POS=3			460 Secs [==>]	[1]	
	<i>Comments: Here we are essentially repeating the HST COS observations of NGC 3783 done as part of program 12212 in order to investigate variation of its intrinsic multi-component UV absorption-line system.</i>									
5	(COS.sp.427 (1) NGC-3783 716)	COS/FUV, TIME-TAG, PSA	G130M 1309 A	BUFFER-TIME=36 0; FP-POS=3			460 Secs [==>]	[1]		
<i>Comments: Here we are essentially repeating the HST COS observations of NGC 3783 done as part of program 12212 in order to investigate variation of its intrinsic multi-component UV absorption-line system.</i>										
6	(COS.sp.427 (1) NGC-3783 716)	COS/FUV, TIME-TAG, PSA	G130M 1318 A	BUFFER-TIME=23 0; FP-POS=3			340 Secs [==>]	[1]		
<i>Comments: Here we are essentially repeating the HST COS observations of NGC 3783 done as part of program 12212 in order to investigate variation of its intrinsic multi-component UV absorption-line system.</i>										
7	(COS.sp.427 (1) NGC-3783 717)	COS/FUV, TIME-TAG, PSA	G160M 1589 A	BUFFER-TIME=48 0; FP-POS=3			580 Secs [==>]	[2]		
<i>Comments: Here we are essentially repeating the HST COS observations of NGC 3783 done as part of program 12212 in order to investigate variation of its intrinsic multi-component UV absorption-line system.</i>										
8	(COS.sp.427 (1) NGC-3783 717)	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=48 0; FP-POS=3			580 Secs [==>]	[2]		
<i>Comments: Here we are essentially repeating the HST COS observations of NGC 3783 done as part of program 12212 in order to investigate variation of its intrinsic multi-component UV absorption-line system.</i>										
9	(COS.sp.427 (1) NGC-3783 717)	COS/FUV, TIME-TAG, PSA	G160M 1611 A	BUFFER-TIME=48 0; FP-POS=3			580 Secs [==>]	[2]		
<i>Comments: Here we are essentially repeating the HST COS observations of NGC 3783 done as part of program 12212 in order to investigate variation of its intrinsic multi-component UV absorption-line system.</i>										
10	(COS.sp.427 (1) NGC-3783 717)	COS/FUV, TIME-TAG, PSA	G160M 1623 A	BUFFER-TIME=31 4; FP-POS=3			424 Secs [==>]	[2]		
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