



11828 - X-ray and FUV Photo-Ionization/-Excitation of Transitional Disks Around the PMS Stars HD135344B and Lk Halpha 330

Cycle: 17, 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) HD135344B	COS/FUV COS/NUV	3	11-Jun-2009 21:09:17.0	yes

3 Total Orbits Used

ABSTRACT

Transitional disks have transformed most of the dust and gas in their inner regions into planetesimals or larger solid bodies. They are a rare, short-lived phase of PMS disk evolution and provide important physical insights and modeling constraints on disk and protoplanetary system evolution. We propose to observe two intermediate mass stars with transitional disks, HD135344B and Lk Halpha 330, using ACIS-S on Chandra and the COS FUV spectrograph on HST. We will use these spectra to determine the coronal, transition region, and upper chromospheric emission measure

distribution, covering temperatures from 10,000 K to 10 MK, and then calculate the full X-ray/EUV/FUV radiation field for use in modeling its photoexcitation/photoionization effects on the disk structure.

OBSERVING DESCRIPTION

The F8 pre-main-sequence star HD135344B (SAO206462) is to be observed using COS G160M/G130M during the 3 orbits allocated. HD130095 is visually bright with $V = 8.71$ and has very accurate coordinates from the Hipparcos/Tycho Catalogue. Its proper motion is small; the coordinates given in this Phase II proposal are already corrected for proper motion to 2000.0.

ORIENT restriction added 2009 June 10 ----- ORIENT from 200 deg to 80 deg. --- as requested by Contact Scientist. This restriction avoids the possibility of HD135344A falling within the PSA.

Our observational sequence is:

Acquisition consists of a 2X2 ACQ/SEARCH followed by an ACQ/IMAGE.

Five segments of G160M spectra fill the rest of Orbit 1 and all of Orbit 2. Orbit 3 contains three G130M exposures.

For our acquisition we use BOA+MIRRORA and 10 second exposures. Using $V=7.81$ to normalize an F8V model shows this to be a safe combination (see COS ETC output COS85813-COS85816).

The COS Spectroscopy ETC indicates no problems for G160M or G130M.

The scientific feasibility rationale in our proposal was:

No moderate or high resolution UV spectra in the 1200-1800 Å spectral region exist for HD135344B.

An 8.5 ksec FUSE observation of HD135344B is very helpful because it shows the presence of O VI and C III transition region emission lines and the fluxes of these lines can be used to estimate the feasibility of COS observations. The stronger O VI doublet line (1032 Å) has an integrated flux of 1.2×10^{-13} ergs cm^{-2} /s. For normal transition region

temperature structure and solar abundances the integrated flux of the equivalent C IV 1548 Å line should be about 3 times larger. Thus we expect a flux of 3×10^{-13} ergs cm^{-2}/s in the stronger C IV line. The O VI lines have a FWHM of 1 Å and we expect the C IV line widths also to have FWHM well over 0.5 Å --- this spreads the flux over more of the COS detector and significantly reduces the line peak flux density compared to that of an unresolved line. We intend to measure the FUV spectrum of HD135344B using a set of G160M and G130M settings to provide full spectral coverage between 1175 and 1775 Å at a velocity resolution of 15 km/s. These spectra will provide well-resolved emission line profiles and the opportunity to search for evidence of absorption by molecular gas close to the star.

Proposal 11828 - Visit 01 - X-ray and FUV Photo-Ionization/-Excitation of Transitional Disks Around the PMS Stars HD13...

Fri Jun 12 01:09:22 GMT 2009

Visit	Proposal 11828, Visit 01, implementation Diagnostic Status: No Diagnostics Scientific Instruments: COS/NUV, COS/FUV Special Requirements: ORIENT 200.0D TO 80.0 D									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	HD135344B	RA: 15 15 48.4390 (228.9518292d) Dec: -37 09 16.03 (-37.15445d) Equinox: J2000	Proper Motion RA: -0.0017s/yr Proper Motion Dec: -0.026"/yr Epoch of Position: 2000.0	V=8.71+/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) HD135344B	COS/NUV, ACQ/SEARCH, BOA	MIRRORA	SCAN-SIZE=2				10 Secs [==>]	[1]
	2	(1) HD135344B	COS/NUV, ACQ/IMAGE, BOA	MIRRORA					10 Secs [==>]	[1]
	3	(1) HD135344B	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=97 5				1085 Secs [==>]	[1]
	4	(1) HD135344B	COS/FUV, TIME-TAG, PSA	G160M 1589 A	BUFFER-TIME=97 5				1085 Secs [==>]	[1]
	5	(1) HD135344B	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=78 0				890 Secs [==>]	[2]
	6	(1) HD135344B	COS/FUV, TIME-TAG, PSA	G160M 1611 A	BUFFER-TIME=78 0				890 Secs [==>]	[2]
	7	(1) HD135344B	COS/FUV, TIME-TAG, PSA	G160M 1623 A	BUFFER-TIME=77 5				885 Secs [==>]	[2]
	8	(1) HD135344B	COS/FUV, TIME-TAG, PSA	G130M 1309 A	BUFFER-TIME=78 0				890 Secs [==>]	[3]
	9	(1) HD135344B	COS/FUV, TIME-TAG, PSA	G130M 1318 A	BUFFER-TIME=78 0				890 Secs [==>]	[3]
10	(1) HD135344B	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=77 5				885 Secs [==>]	[3]	



