



10348 - The Production of X-ray Emission in Classical T Tauri Stars

Cycle: 13, Proposal Category: GO

(Availability Mode: AVAILABLE)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets</i>	<i>Configurations</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) V4046SGR	ACS/HRC ACS/SBC	1	27-Jun-2005 21:06:25.0	yes

1 Total Orbits Used

ABSTRACT

We propose to obtain a 150 ks HETG spectrum of the Classical T Tauri Star (CTTS) V4046 Sgr. The unknown source of strong X-ray emission remains a glaring weakness in our understanding of energetics around young stars. An HETG observation of the CTTS TW Hya suggested that the physical properties of the hot gas around accreting stars may be different from solar-like coronae. This difference hints that accretion may produce most of the X-rays from CTTSs. However, this tentative conclusion is based on observations of only one CTTS, that may not be representative of its class. We seek to verify this conclusion, and to obtain a better understanding of the temperature, electron density, and abundances of hot gas around

CTTSs, by obtaining a high S/N HETG spectrum of an X-ray bright CTTS.

OBSERVING DESCRIPTION

We will use HST/ACS to obtain low-resolution FUV-NUV-optical spectra of V4046 Sgr to estimate the extinction and mass accretion rate, and FUV radiation field from the star. The observations will consist of SBC PR130L, HRC PR200L, and HRC G800L spectra.

CTTSs are variable, particularly in the FUV. To understand our X-ray spectra and the properties of V4046 Sgr during that spectra, we require that these observations must occur contemporaneous (within 1 week) of our Chandra observation of V4046 Sgr.

We use an IUE spectrum of V4046 Sgr to calculate FUV and NUV exposure times. We also use optical STIS spectra of TW Hya as a template for V4046 Sgr.

We will obtain an optical spectrum of V4046 Sgr with the G800L Grism on the HRC. We calculate an exposure time of 5 s for this optical spectrum to obtain S/N of at least 100 over the wavelength range. The optical spectrum would be saturated in about 31 s.

We will obtain one short (11 s) and one longer (62 s) NUV spectrum with the P200L on the HRC. The longer portion of this wavelength range is saturated in about 18 s. The longer exposure will yield S/N of at least 30 across the entire wavelength regime.

The 441 s FUV spectrum will result in a S/N of at least 30 across the entire wavelength regime. The maximum count rate per pixel is about 12 at 1550 (C IV).

We will also obtain an FUV image of V4046 Sgr using the F165LP filter in order to calibrate the wavelengths in our FUV spectrum. In this image we will detect about 32 cts/s from the source, with the brightest pixel detecting about 6 cts/s.

REAL TIME JUSTIFICATION

Proposal 10348 - Overview

These observations must occur contemporaneous (within 1 week) of our Chandra observation of V4046 Sgr.

Proposal 10348 - Visit 01 - The Production of X-ray Emission in Classical T Tauri Stars

Tue Jun 28 01:06:28 GMT 2005

Visit	Proposal 10348, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC, ACS/HRC Special Requirements: (none) <i>Comments: Needs to be coordinated with Chandra observation of V4046 Sgr</i>									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	V4046SGR Alt Name1: HD319139 Alt Name2: AS292	RA: 18 14 10.5000 (273.5437500d) Dec: -32 47 33.58 (-32.79266d) Equinox: J2000 Plate Id: 067E		V=10.5	Coordinate Source: GUIDE_STAR_CATALOG				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	O III image	(1) V4046SGR	ACS/HRC, ACCUM, HRC	F502N				214.0 Secs [=>(Split 1)] [=>(Split 2)]	[1]
	2	H-alpha image	(1) V4046SGR	ACS/HRC, ACCUM, HRC	F658N				214.0 Secs [=>(Split 1)] [=>(Split 2)]	[1]
	3	short V-band image	(1) V4046SGR	ACS/HRC, ACCUM, HRC	F606W				0.2 Secs [=>(Split 1)] [=>(Split 2)]	[1]
	4	NUV	(1) V4046SGR	ACS/HRC, ACCUM, HRC	PR200L	AUTOIMAGE=NO			10.0 Secs [=>(Split 1)] [=>(Split 2)]	[1]
	5	NUV	(1) V4046SGR	ACS/HRC, ACCUM, HRC	PR200L	AUTOIMAGE=NO			80.0 Secs [=>(Split 1)] [=>(Split 2)]	[1]
	6	Optical spectrum	(1) V4046SGR	ACS/HRC, ACCUM, HRC	G800L	AUTOIMAGE=NO			5.0 Secs [=>(Split 1)] [=>(Split 2)]	[1]
	7	FUV	(1) V4046SGR	ACS/SBC, ACCUM, SBC	PR130L				630.0 Secs [=>]	[1]
	8	FUV image	(1) V4046SGR	ACS/SBC, ACCUM, SBC	F165LP				30.0 Secs [=>]	[1]

