



12361 - Chandra X-ray and HST/COS+STIS UV Spectroscopy of Low-Mass Stars in the 9 Myr Old TW Hya Association

Cycle: 18, 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) TWA13A (2) TWA13-OFFSET WAVE	COS/FUV COS/NUV STIS/CCD STIS/NUV-MAMA	5	11-Oct-2010 21:40:31.0	yes

5 Total Orbits Used

ABSTRACT

The TW Hya association (age ~ 9 Myr, distances ~ 50 pc) is the nearest group of young stars with ages < 10 Myr and has stars with both actively accreting and debris disks. Consequently, this association offers special opportunities for studying protoplanetary system evolution. We propose to study low mass TWA members using Chandra ACIS-S to obtain CCD resolution X-ray spectra and the HST COS+STIS spectrographs to obtain

medium resolution FUV and NUV spectra. Using these spectra we will study the temperature/EM distributions of the hot ($\log T = 4-7$ K) plasma, examine the flows and turbulence in the hot plasma, and construct the full X-ray/EUV/FUV radiation fields to allow modeling their influence on protoplanetary system physics and chemistry. [Chandra and HST time awarded to observe the common proper motion pair TWA 13 A + 13B.]

OBSERVING DESCRIPTION

Two TWA Association members are to be observed using COS G130M/G160M and the brighter will also be observed using STIS G230L and E230M. These stars are a common proper motion pair separated by ~ 5 arcseconds. Both are M1 dwarfs and have V magnitudes of 11.5 (TWA13A) and 12.0 (TWA13B).

No UV spectra exist for TWA 13 A+B. Therefore, we have constructed our Phase II observing sequence to match successfully implemented COS/STIS observations for young stars with similar properties and brightness by Cycle 17 program 11616. N.B. we are using exposure times and settings matching those for stars that have ALREADY been observed by 11616, such as GM Aur ($V=12.2$), RECX-11 ($V=11.2$), and RECX-1 ($V=10.5$), that span a magnitude range encompassing the TWA 13 stars. TWA 13 is old enough that the stars are no longer accreting and do not have circumstellar disks; thus their UV continuum will not show variability due to variable accretion.

The coordinates given in this Phase II proposal are from the 2MASS Catalog and are already corrected for proper motion to 2000.0. The proper motions are relatively small and are the most accurate currently available from the as yet unpublished work of Mamajek. The positions and proper motions are accurate enough that the positional error for TWA 13A will be far less than 1 arcsecond and there should be no chance of acquiring TWA 13B by mistake.

We acquire TWA 13A using a COS ACQ/IMAGE with MIRRORB and the PSA, and then obtain four G130M exposures in the rest of Orbit 1. Orbit 2 is used for three G160M exposures.

Orbit 3 starts with an offset to TWA 13B and then contains four G130M exposures, while orbit 4 is used for three G160M exposures.

Orbit 5 starts with a STIS acquisition of TWA 13A and then obtains G230L and E230M spectra with the NUV-MAMA.

Proposal 12361 (STScI Edit Number: 2, Created: Monday, October 11, 2010 8:40:41 PM EST) - Overview

Visit	Proposal 12361, Visit 01, implementation Tue Oct 12 01:40:42 GMT 2010				
	Diagnostic Status: No Diagnostics Scientific Instruments: COS/NUV, COS/FUV, STIS/CCD, STIS/NUV-MAMA Special Requirements: (none)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
	(1)	TWA13A	RA: 11 21 17.2400 (170.3218333d) Dec: -34 46 45.49 (-34.77930d) Equinox: J2000	Proper Motion RA: -0.005470632794213105s/yr Proper Motion Dec: -0.0170"/yr Parallax: 0.0172" Epoch of Position: 2000.0	V=11.5+/-0.01
	(2)	TWA13-OFFSET Alt Name1: TWA13B	Offset from TWA13A by RA Offset: 0.218 Secs Dec Offset: -4.28 Arcsec	Proper Motion RA: 0.0s/yr Proper Motion Dec: -0.0"/yr Parallax: 0.0" Epoch of Position: 2000.0	V=12.1+/-0.1 Offset Position (TWA13-OFFSET) Reference Frame: ICRS
Comments: Common proper motion companion to TWA13A.					

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Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) TWA13A	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				60 Secs	
									[==>]	[1]
	2		(1) TWA13A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=39 0; FP-POS=1			500 Secs	
									[==>]	[1]
	3		(1) TWA13A	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=40 0; FP-POS=4			510 Secs	
									[==>]	[1]
	4		(1) TWA13A	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=39 0; FP-POS=1			500 Secs	
									[==>]	[1]
	5		(1) TWA13A	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=37 5; FP-POS=4			485 Secs	
									[==>]	[1]
	6		(1) TWA13A	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=75 0; FP-POS=3			860 Secs	
									[==>]	[2]
	7		(1) TWA13A	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=75 0; FP-POS=4; SEGMENT=BOTH			860 Secs	
									[==>]	[2]
	8		(1) TWA13A	COS/FUV, TIME-TAG, PSA	G160M 1623 A	BUFFER-TIME=75 0; FP-POS=3; SEGMENT=BOTH			860 Secs	
									[==>]	[2]
	9		(2) TWA13-OFFSE T	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=53 5; FP-POS=1			645 Secs	
									[==>]	[3]
	10		(2) TWA13-OFFSE T	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=51 5; FP-POS=4			625 Secs	
									[==>]	[3]
	11		(2) TWA13-OFFSE T	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=53 5; FP-POS=1			645 Secs	
									[==>]	[3]
	12		(2) TWA13-OFFSE T	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=51 5; FP-POS=4			625 Secs	
									[==>]	[3]
	13		(2) TWA13-OFFSE T	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=76 0; FP-POS=3; SEGMENT=BOTH			870 Secs	
									[==>]	[4]
	14		(2) TWA13-OFFSE T	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=76 0; FP-POS=4; SEGMENT=BOTH			870 Secs	
									[==>]	[4]
	15		(2) TWA13-OFFSE T	COS/FUV, TIME-TAG, PSA	G160M 1623 A	BUFFER-TIME=75 0; FP-POS=3			860 Secs	
									[==>]	[4]

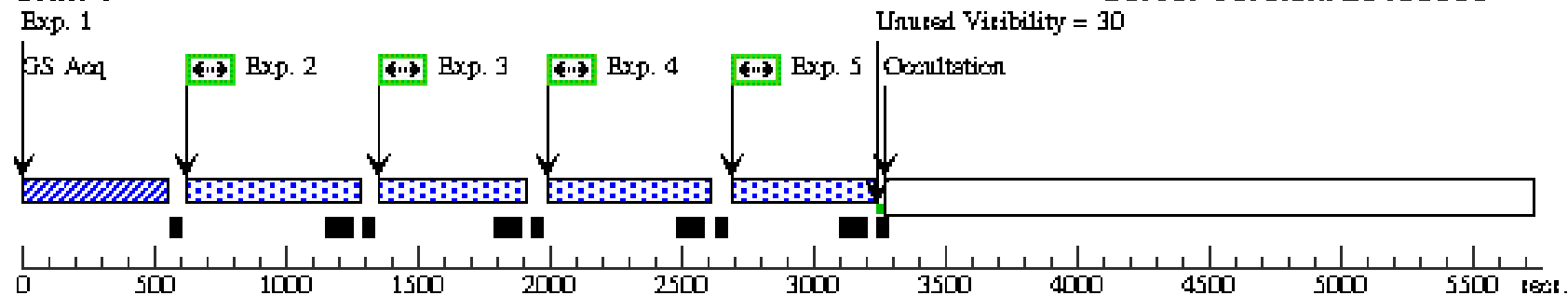
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	16	(1) TWA13A	STIS/CCD, ACQ, F28X50OIII	MIRROR	10 Secs	
					[==>]	[5]
	17	(1) TWA13A	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A	500 Secs	
					[==>]	[5]
	18	(1) TWA13A	STIS/NUV-MAMA, TIME-TAG, 0.2X0.2	E230M 2561 A	BUFFER-TIME=15 00	1410 Secs
					[==>]	[5]
	19	WAVE	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 2561 A	25 Secs	
					[==>]	[5]

Orbit 1

Exp. 1

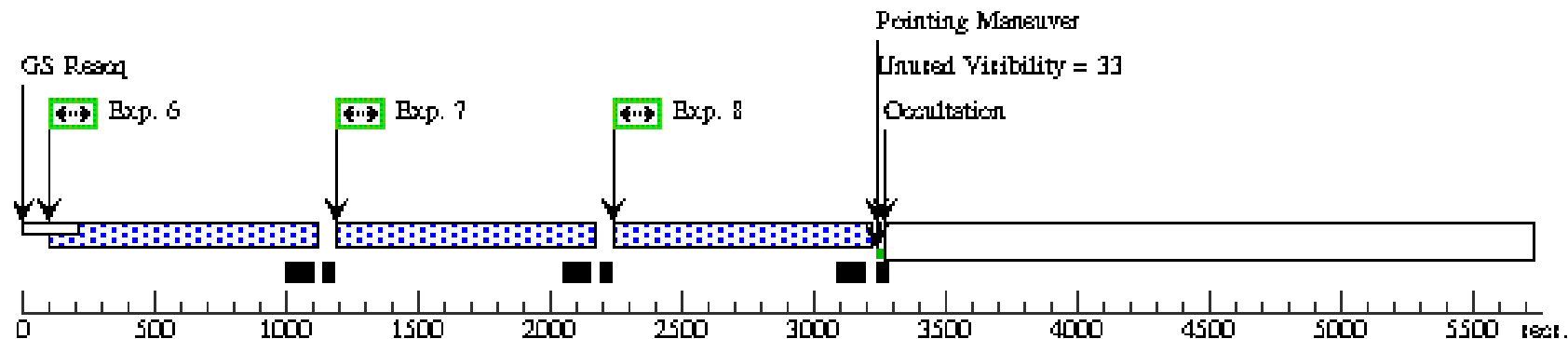
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Orbit 2

GS Reseq

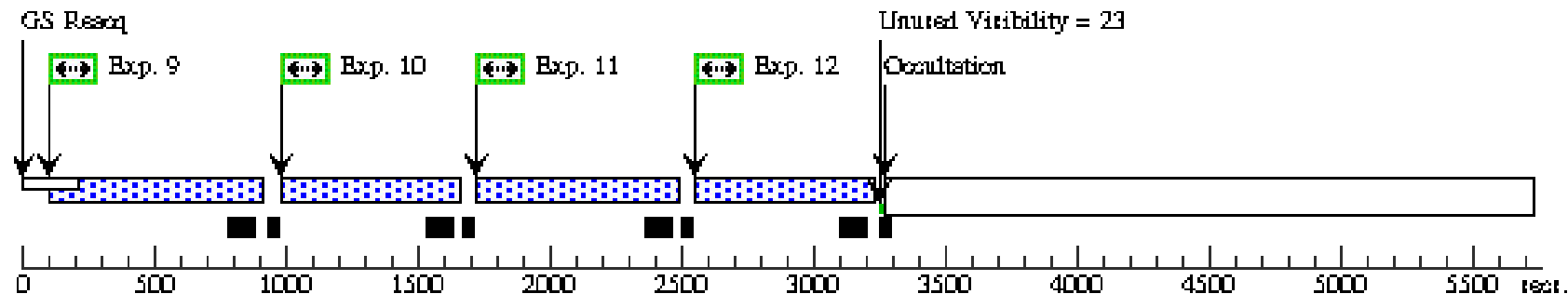
Server Version: 20100505



Orbit 3

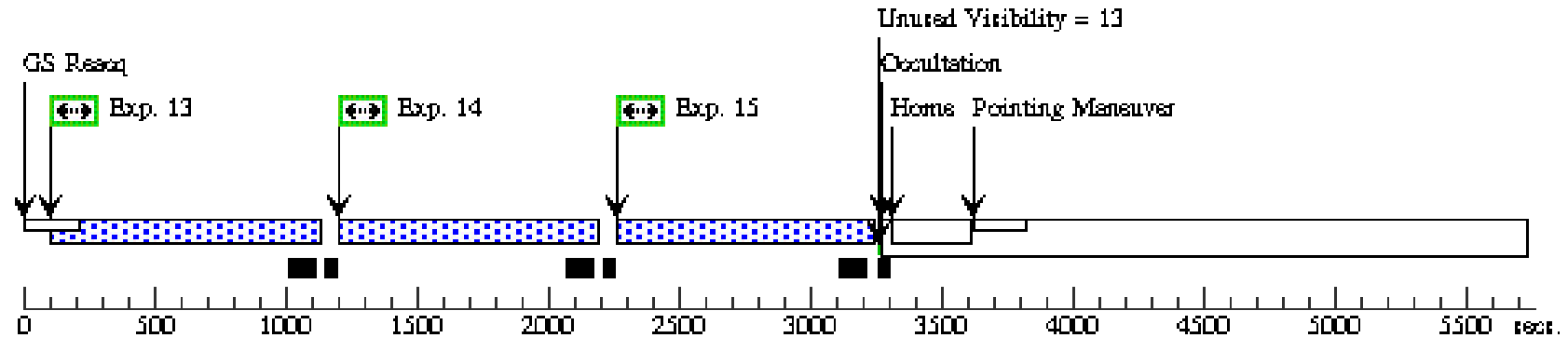
GS Reseq

Server Version: 20100505



Orbit 4

Server Version: 20100505



Orbit 5

Server Version: 20100505

