14480 - Joint XMM-Newton and HST study of the magnetic weak-wind O-star HD 54879

Cycle: 24, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) HD-54879	STIS/CCD STIS/FUV-MAMA	1	19-Mar-2016 21:02:59.0	yes

1 Total Orbits Used

ABSTRACT

Current massive-star astrophysics struggles with a number of urgent questions: what are the true mass-loss rates, what is the role of magnetic fields, how are X-rays produced? HD54879 provides an important laboratory to study these questions. While a strong magnetic field (2.1 ,kG) has been recently detected in this star, it otherwise exhibits a normal spectrum of O9.7 main sequence type. We propose joint XMM and HST observations of HD54879. Analysis of the UV spectrum will establish the parameters of the cool stellar wind, while from the XMM data the hot plasma component will be studied. The new observations will establish a gauge for stellar wind theory and provide a template X-ray spectrum for magnetic massive stars with weak wind.

OBSERVING DESCRIPTION

The immediate objective is to obtain the first UV spectrum of HD54879, using the HST STIS spectrograph. This will be the first UV spectrum of a non-peculiar late-type O dwarf with confirmed magnetic field. From these data, we want to infer the stellar wind parameters, especially the mass-loss rate and the wind velocity.

The requested observations shall be performed with the E140M echelle grating centered at 1425Ang, and recorded by the FUV MAMA detector. The high spectral resolution is needed to separate the wind lines from the photospheric iron line forest. We aim at a S/N ratio of about 50 at the C IV doublet (~1500Ang). We uploaded the predicted model flux to the HST exposure time calculator (STIS.sp.639603), and obtained an exposure time of 42min. With the small 0.1" x0.03" aperture, the total count rate stays below the MAMA bright limit by a factor of two, which is safe since the source is not variable.

Visit

Proposal 14480, Visit 01, implementation Sun Mar 20 01:03:01 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-54879	RA: 07 10 8.1495 (107.5339563d)	Proper Motion RA: -2.16 mas/yr	V=7.65	Reference Frame: ICRS
		Dec: -11 48 9.84 (-11.80273d)	Proper Motion Dec: 0.81 mas/yr		
		Equinox: J2000	Epoch of Position: 2000		

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.772 310)	(1) HD-54879	STIS/CCD, ACQ, F25ND3	MIRROR				4 Secs (4 Secs)	
								[==>]	***[1]***
2	(STIS.ta.780 768)	(1) HD-54879	STIS/CCD, ACQ/PEAK, 0.3X0.05ND	MIRROR				2 Secs (2 Secs)	
								[==>]	***[1]***
3	(STIS.ta.781 232)	(1) HD-54879	STIS/CCD, ACQ/PEAK, 0.1X0.03	G430L				0.1 Secs (0.1 Secs)	
				4300 A				*[==>]*	***[1]***
4	(STIS.sp.63 9603)	(1) HD-54879	STIS/FUV-MAMA, ACCUM, 0.1X0.03	E140M				580 Secs (383 Secs)	
				1425 A				*[==>383.0 Secs]*	***[1]***
5	(STIS.sp.63 9603)	(1) HD-54879	STIS/FUV-MAMA, ACCUM, 0.1X0.03	E140M				580 Secs (383 Secs)	
				1425 A				*[==>383.0 Secs]*	***[1]***
6	(STIS.sp.63 9603)	(1) HD-54879	STIS/FUV-MAMA, ACCUM, 0.1X0.03	E140M				550 Secs (353 Secs)	
				1425 A				*[==>353.0 Secs]*	***[1]***

Orbit Structure