14690 - Identifing the last unkown emission component in the Herbig system HD 163296

Cycle: 24, Proposal Category: GO

(UV Initiative)

(Availability Mode: AVAILABLE)

INVESTIGATORS

Name	*Institution*	*E-Mail*
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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-163296 WAVE	STIS/CCD STIS/FUV-MAMA	1	07-Sep-2016 18:13:56.0	yes
02	(1) HD-163296 WAVE	STIS/CCD STIS/FUV-MAMA	1	07-Sep-2016 18:13:57.0	yes
03	(1) HD-163296 WAVE	STIS/CCD STIS/FUV-MAMA	1	07-Sep-2016 18:13:58.0	yes

3 Total Orbits Used

ABSTRACT

The HAeBe star HD 163296 is surrounded by a circum-stellar accretion disk and drives a highly-collimated jet. It was observed four times in the UV with HST/STIS long-slit spectroscopy; in all cases the slit was oriented along the jet. These observations discovered extended, red-shifted Ly alpha emission of unknown origin on the same side of the star as the blue-shifted jet. We propose to explore the origin of this component using three new

STIS G140M long-slit exposures with different position angles. This allows us to differentiate three scenarios for the emission: (i) dust scattering in the jet, (ii) dust scattering in the disk and (iii) a very fast disk wind. Case (i) would show that the jet is a collimated disk wind, not a stellar wind, (ii) would imply that the Ly alpha emission comes from magnetically funneled accretion and (iii) would prove that the disk wind is an order of magnitude faster than expected from photo-evaporation models. Each of these results would constitute a major step in our understanding of intermediate mass star formation.

OBSERVING DESCRIPTION

HH 409 was observed with STIS in 1999, 2000 and 2011. The most prominent line in the FUV is Ly alpha which is spatially extended beyond 200 AU with a kinematic signature incompatible with the known jet in this object.

We have 3 orbits of HST time to measure i) the position and ii) the spectrum of the extended Ly alpha emission. The HST observations closely resemble existing observations which show that no safety constraint will be violated; we copied the exposure times for ACQ exposures from those existing observations (I also tried to replicate that in the ETC, so that I could paste a numbers in the form that asks for an ETC run, but really, we know what we get based on the exisiting obsrvations).

We observe the FUV lines with the G140M grating, central wavelength 1218 Ang for one full orbit. We will use the 52x0.05 slit. At 1200 A the throughput is about 20%, half the value of the 52x0.2 slit which was used in the previous observations.

Three observations should be done:

- Parallel to the jet (like previous observations, but with a narrower slit)
- Perpendicular to the jet
- in-between

In order to make those observations schedulable, we have to increase the schedulability and allow for shorter observations.

The extended Ly alpha as well as the continuum are bright enough to measure their spatial profile with less than half the flux of the existing data (flux reduced by narrower slit + shorter visits due to increased scheduling flexibility) and by using the narrower slit we will obtain a better spectral resolution and, more importantly, minimize the region of overlap on the sky (if e.g. the feature extended 0.25", but only in the jet direction, then all the emission would be seen in a slit with width 0.5" independent of the position angle).

Visit

Proposal 14690, parallel (01), implementation Wed Sep 07 22:13:58 GMT 2016

Diagnostic Status: No Diagnostics

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

Special Requirements: ORIENT 88.3D TO 90.3 D; BETWEEN 01-JUL-2017 AND 30-AUG-2017

Fixed Targets

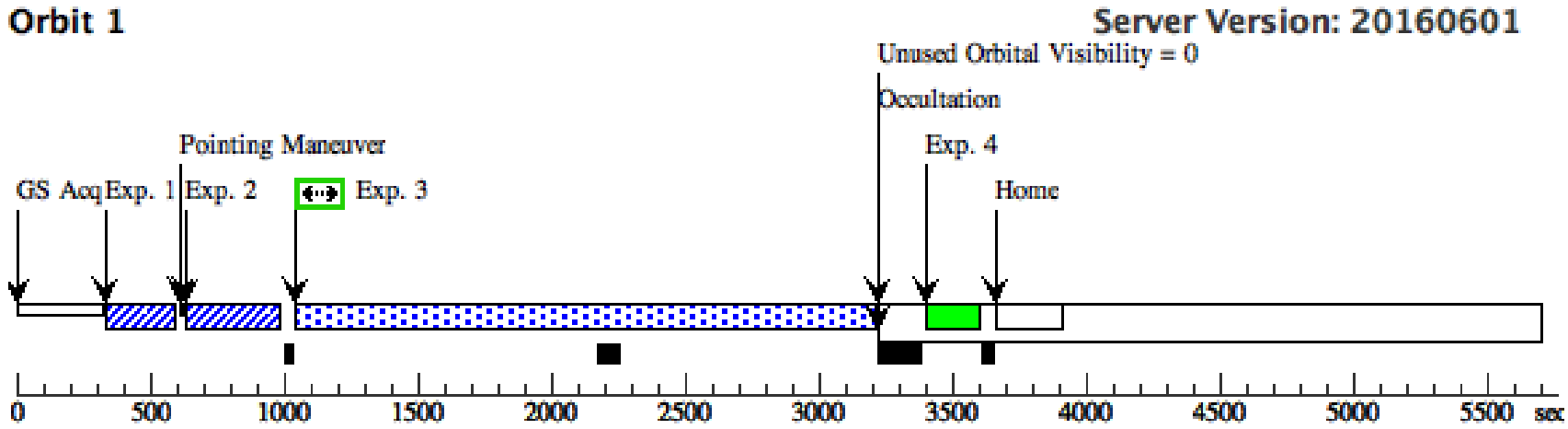
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-163296	RA: 17 56 21.2880 (269.0887000d) Dec: -21 57 21.87 (-21.95607d) Equinox: J2000	Proper Motion RA: -7.98 mas/yr Proper Motion Dec: -39.21 mas/yr Parallax: 0.00843" Epoch of Position: 2000	V=6.86	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.821763)	(1) HD-163296	STIS/CCD, ACQ, F28X50OII	MIRROR				1.5 Secs (1.5 Secs) *[==>]*	*[1]*
2	(STIS.ta.821776)	(1) HD-163296	STIS/CCD, ACQ/PEAK, 52X0.05	G430L 4300 A				1 Secs (1 Secs) *[==>]*	*[1]*
3	(STIS.sp.821770)	(1) HD-163296	STIS/FUV-MAMA, TIME-TAG, 52X0.05	G140M 1218 A	BUFFER-TIME=1000; WAVECAL=NO			1000 Secs (2021 Secs) *[==>2021.0 Secs]*	*[1]*
4		WAVE	STIS/FUV-MAMA, ACCUM, 52X0.05	G140M 1218 A				*[==>]*	*[1]*

Orbit Structure



Visit

Proposal 14690, inbetween (02), implementation Wed Sep 07 22:13:59 GMT 2016

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%; ORIENT 130D TO 160 D; ORIENT 310D TO 340 D

Fixed Targets

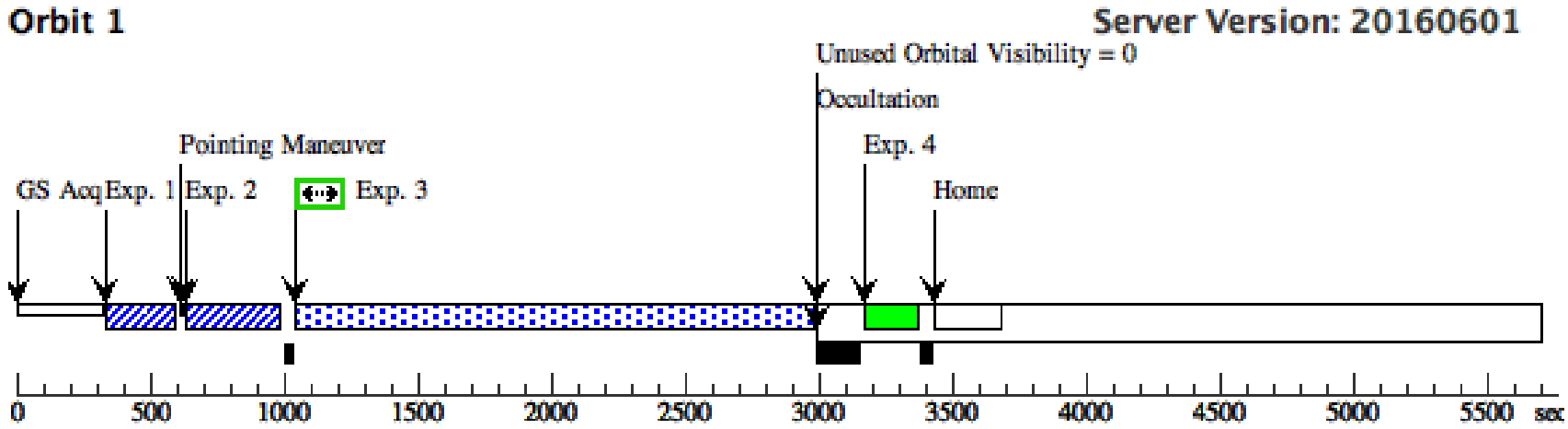
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-163296	RA: 17 56 21.2880 (269.0887000d) Dec: -21 57 21.87 (-21.95607d) Equinox: J2000	Proper Motion RA: -7.98 mas/yr Proper Motion Dec: -39.21 mas/yr Parallax: 0.00843" Epoch of Position: 2000	V=6.86	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.821763)	(1) HD-163296	STIS/CCD, ACQ, F28X50OII	MIRROR				1.5 Secs (1.5 Secs) *[==>]*	*[1]*
2	(STIS.ta.821776)	(1) HD-163296	STIS/CCD, ACQ/PEAK, 52X0.05	G430L 4300 A				1 Secs (1 Secs) *[==>]*	*[1]*
3	(STIS.sp.821770)	(1) HD-163296	STIS/FUV-MAMA, TIME-TAG, 52X0.05	G140M 1218 A	BUFFER-TIME=1000; WAVECAL=NO			1000 Secs (1792 Secs) *[==>1792.0 Secs]*	*[1]*
4		WAVE	STIS/FUV-MAMA, ACCUM, 52X0.05	G140M 1218 A				*[==>]*	*[1]*

Orbit Structure



Visit

Proposal 14690, perpendicular (03), implementation Wed Sep 07 22:13:59 GMT 2016

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%; ORIENT 0D TO 30 D; ORIENT 180D TO 210 D

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD-163296	RA: 17 56 21.2880 (269.0887000d) Dec: -21 57 21.87 (-21.95607d) Equinox: J2000	Proper Motion RA: -7.98 mas/yr Proper Motion Dec: -39.21 mas/yr Parallax: 0.00843" Epoch of Position: 2000	V=6.86	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.821763)	(1) HD-163296	STIS/CCD, ACQ, F28X50OII	MIRROR				1.5 Secs (1.5 Secs) *[==>]*	*[1]*
2	(STIS.ta.821776)	(1) HD-163296	STIS/CCD, ACQ/PEAK, 52X0.05	G430L 4300 A				1 Secs (1 Secs) *[==>]*	*[1]*
3	(STIS.sp.821770)	(1) HD-163296	STIS/FUV-MAMA, TIME-TAG, 52X0.05	G140M 1218 A	BUFFER-TIME=1000; WAVECAL=NO			1000 Secs (1792 Secs) *[==>1792.0 Secs]*	*[1]*
4		WAVE	STIS/FUV-MAMA, ACCUM, 52X0.05	G140M 1218 A				*[==>]*	*[1]*

Orbit Structure