



15353 - Luminous Herbig-Haro objects from a massive protostar: The unique case of HH 80/81

Cycle: 25, 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) HH-80	WFC3/UVIS	1	18-Jul-2017 10:08:13.0	yes
02	(1) HH-80	WFC3/UVIS	2	18-Jul-2017 10:08:14.0	yes
03	(1) HH-80	WFC3/UVIS	2	18-Jul-2017 10:08:15.0	yes
04	(1) HH-80	WFC3/UVIS	1	18-Jul-2017 10:08:15.0	yes
05	(1) HH-80	WFC3/UVIS	2	18-Jul-2017 10:08:16.0	yes
06	(1) HH-80	WFC3/UVIS	1	18-Jul-2017 10:08:16.0	yes

9 Total Orbits Used

ABSTRACT

Herbig-Haro (HH) objects are the optical manifestations of shock waves excited by outflows from young stars. They represent one of the few classes of spatially extended astronomical objects where both structural changes and proper motions can be measured on time scales of years to decades. HH

Proposal 15353 (STScI Edit Number: 0, Created: Tuesday, July 18, 2017 9:08:17 AM EST) - Overview

80/81 is a pair of HH objects in Sagittarius which are the intrinsically most luminous HH objects known. The driving source of HH 80/81 is the embedded star IRAS 18162-2048, which has a luminosity of 20,000 L_{sun} and excites a compact HII region, suggesting that it is a newborn massive star. HH objects associated with massive young stars are very rare, only a handful of cases are known, but what makes the HH 80/81 source unique among massive protostars is that it produces a finely collimated bipolar radio jet with extremely high velocity and pointing straight to HH 80/81. We propose to observe the HH~80/81 complex with WFC3 and the following four filters: H α 6563, H β 4861, [SII] 6717/31, and [OIII] 5007. First epoch HST images were obtained 22 years ago, which now allows a very precise determination of proper motions. Groundbased optical and radio proper motions are not only uncertain, but actually contradict each other, a controversy that will be resolved by HST. The fine resolution of WFC3 allows a study of both fine structural details and structural changes of the shocks. Finally we will use a sophisticated adaptive grid code to interpret the (de-reddened) line ratios across the shocks.

OBSERVING DESCRIPTION

Obtain images of HH 80/81 in 4 narrow-band filters, WFC3/UVIS F656N (H-alpha), F487N (H-beta), F673N ([SII]), and F502N ([OIII]).

The one orbit of F656N imaging will consist of two exposures taken with a slight dither to fill-in the chip gaps and facilitate cosmic ray and hot pixel removal.

Two F487N images will be acquired during each of 2 orbits. The 4 images will be dithered with a small offset pattern to fill-in the gap between the CCDs

A pattern of six images in three orbits each will be acquired in both the F673N and F502N filters.

Proposal 15353 - Visit 01 HH80 H-alpha (01) - Luminous Herbig-Haro objects from a massive protostar: The unique case of HH 80/81

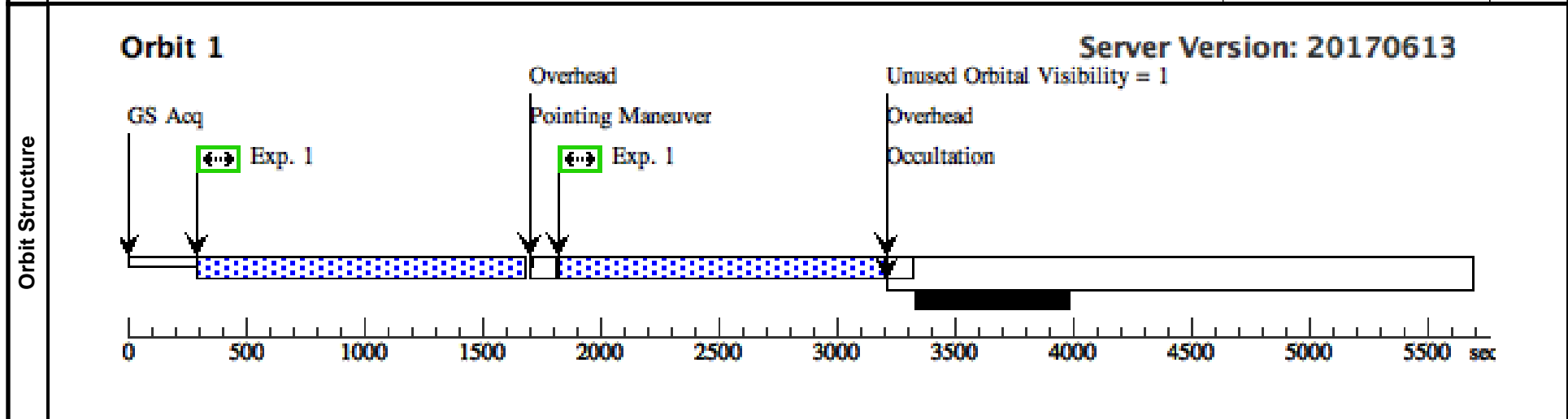
Tue Jul 18 14:08:17 GMT 2017

Visit	Proposal 15353, Visit 01 HH80 H-alpha (01) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 110D TO 110 D Comments: 1 orbit of F656N imaging		
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Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(1)	Pattern Type=WFC3-UVIS-GAP-LINE Coordinate Frame=POS-TARG Purpose=DITHER Pattern Orientation=85.759 Number Of Points=2 Angle Between Sides= Point Spacing=2.414 Center Pattern=true Line Spacing=		(1)

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	HH-80	RA: 18 19 6.3460 (274.7764417d) Dec: -20 51 27.90 (-20.85775d) Equinox: J2000		V=16	Reference Frame: SIMBAD
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.						

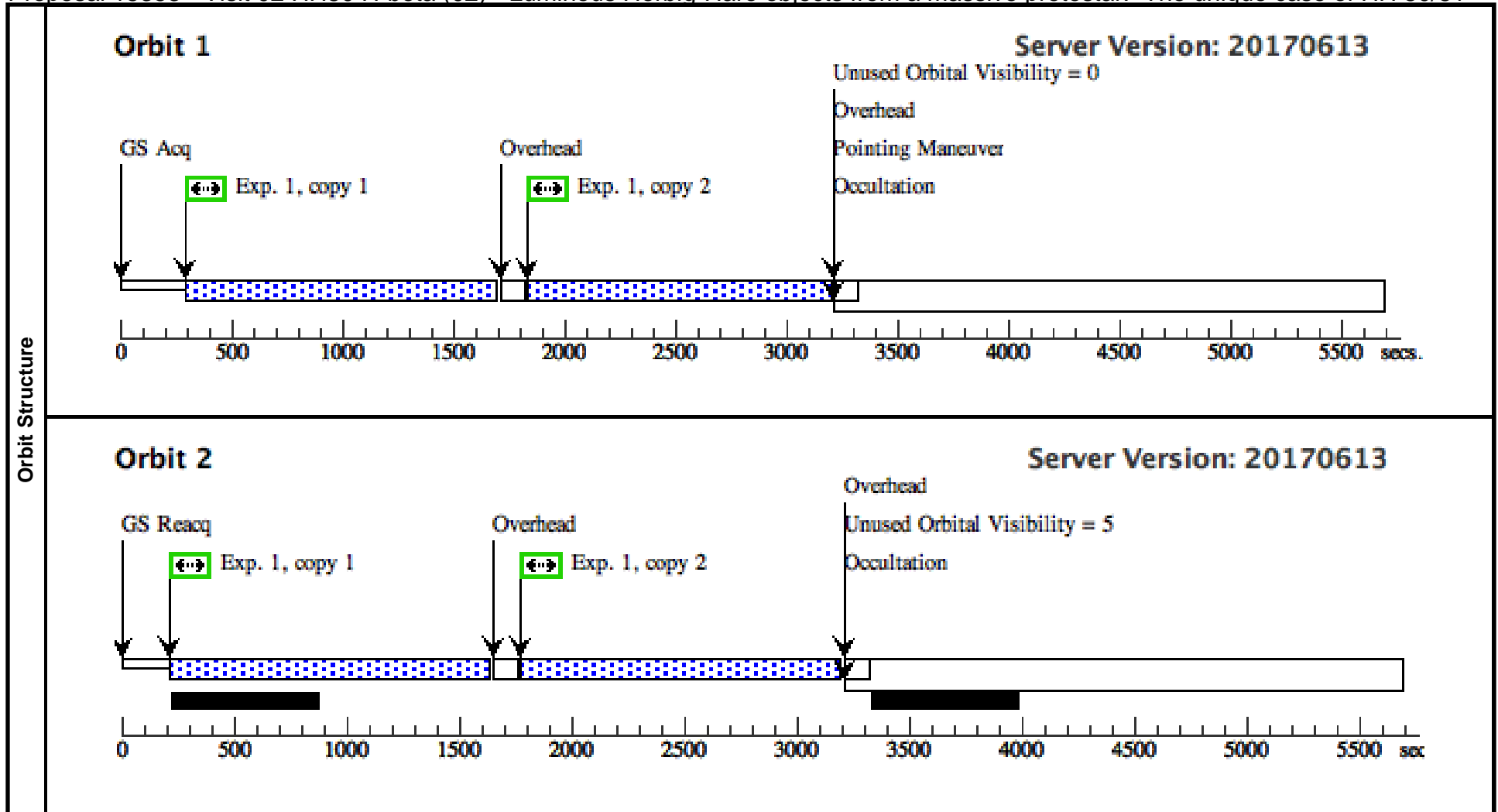
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) HH-80	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N	FLASH=12		Pattern 1, Exps 1-1 in Visit 01 HH80 H-alpha (01) (1)	1370 Secs (2740 Secs) [==>1361.0 Secs (Pattern 1)] [==>1379.0 Secs (Pattern 2)]	[1]



Proposal 15353 - Visit 02 HH80 H-beta (02) - Luminous Herbig-Haro objects from a massive protostar: The unique case of HH 80/81

Tue Jul 18 14:08:17 GMT 2017

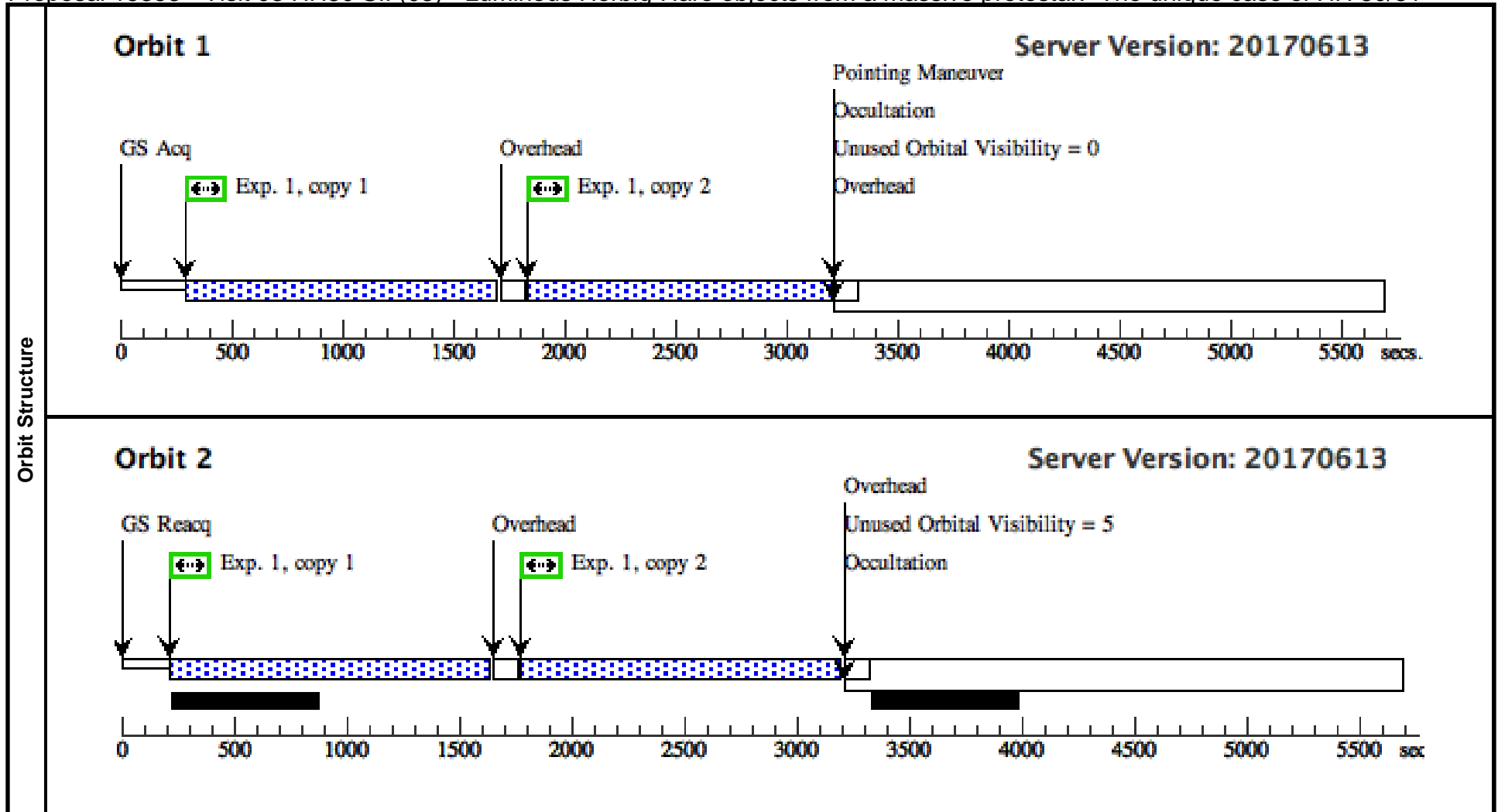
Visit	Proposal 15353, Visit 02 HH80 H-beta (02) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 110D TO 110 D Comments: 2 orbits of F487N imaging										
	Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
(1)		Pattern Type=WFC3-UVIS-GAP-LINE Coordinate Frame=POS-TARG Purpose=DITHER Pattern Orientation=85.759 Number Of Points=2 Angle Between Sides= Point Spacing=2.414 Center Pattern=true Line Spacing=							(1)		
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(1)	HH-80	RA: 18 19 6.3460 (274.7764417d) Dec: -20 51 27.90 (-20.85775d) Equinox: J2000				V=16	Reference Frame: SIMBAD			
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1	(1) HH-80	(1) HH-80	WFC3/UVIS, ACCUM, UVIS-CENTER	F487N	FLASH=10		Pattern 1, Exps 1-1 i n Visit 02 HH80 H-b eta (02) (1)	1350 Secs X 2 (5590 Secs)		
									[==>1371.0 Secs (Pattern 1, Copy 1)]		[1]
									[==>1371.0 Secs (Pattern 1, Copy 2)]		
									[==>1424.0 Secs (Pattern 2, Copy 1)]		[2]
									[==>1424.0 Secs (Pattern 2, Copy 2)]		



Proposal 15353 - Visit 03 HH80 SII (03) - Luminous Herbig-Haro objects from a massive protostar: The unique case of HH 80/81

Tue Jul 18 14:08:17 GMT 2017

Visit	Proposal 15353, Visit 03 HH80 SII (03) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 110D TO 110 D Comments: First 2 orbits of th 3 orbits of F673N imaging with WFC3									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=WFC3-UVIS-GAP-LINE	Coordinate Frame=POS-TARG						
		Purpose=DITHER	Pattern Orientation=85.759							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=2.414	Center Pattern=true							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous		
	(1)	HH-80	RA: 18 19 6.3460 (274.7764417d)	Dec: -20 51 27.90 (-20.85775d)			V=16	Reference Frame: SIMBAD		
			Equinox: J2000	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.						
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	HH80 SII	(1) HH-80	WFC3/UVIS, ACCUM, UVIS-CENTER	F673N	FLASH=10		Pattern 1, Exps 1-1 in Visit 03 HH80 SII (03) (1)	1350 Secs X 2 (5590 Secs)	
									[==>1371.0 Secs (Pattern 1, Copy 1)]	[1]
									[==>1371.0 Secs (Pattern 1, Copy 2)]	
									[==>1424.0 Secs (Pattern 2, Copy 1)]	[2]
									[==>1424.0 Secs (Pattern 2, Copy 2)]	



Proposal 15353 - Visit 04 HH80 SII (04) - Luminous Herbig-Haro objects from a massive protostar: The unique case of HH 80/81

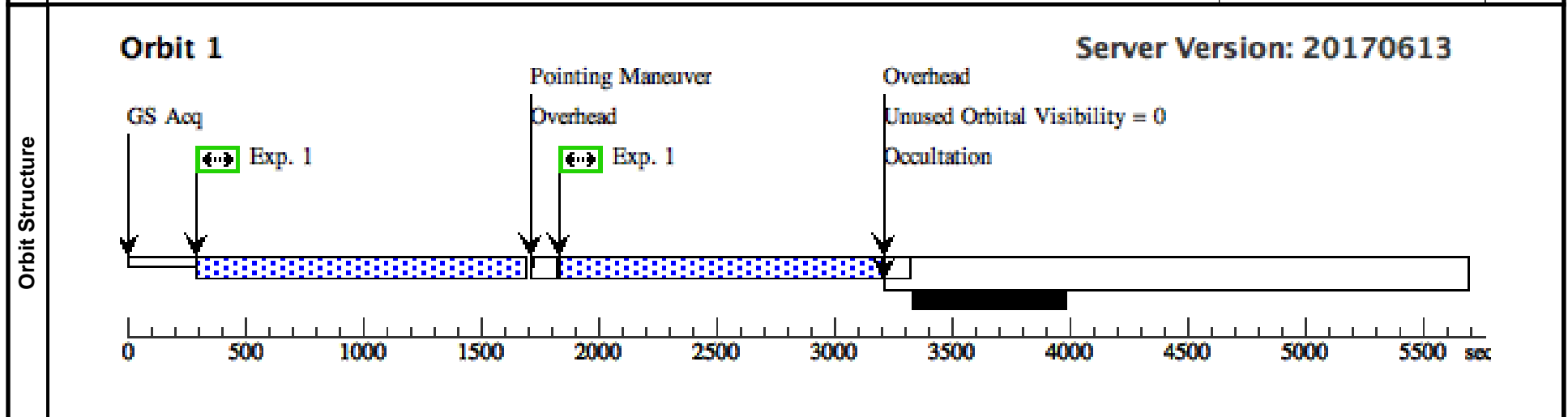
Tue Jul 18 14:08:17 GMT 2017

Visit	Proposal 15353, Visit 04 HH80 SII (04) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 110D TO 110 D Comments: 1 orbits of F673N imaging with WFC3		
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Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(1)	Pattern Type=WFC3-UVIS-GAP-LINE Coordinate Frame=POS-TARG Purpose=DITHER Pattern Orientation=85.759 Number Of Points=2 Angle Between Sides= Point Spacing=2.414 Center Pattern=true Line Spacing=		(1)

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	HH-80	RA: 18 19 6.3460 (274.7764417d) Dec: -20 51 27.90 (-20.85775d) Equinox: J2000		V=16	Reference Frame: SIMBAD
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					

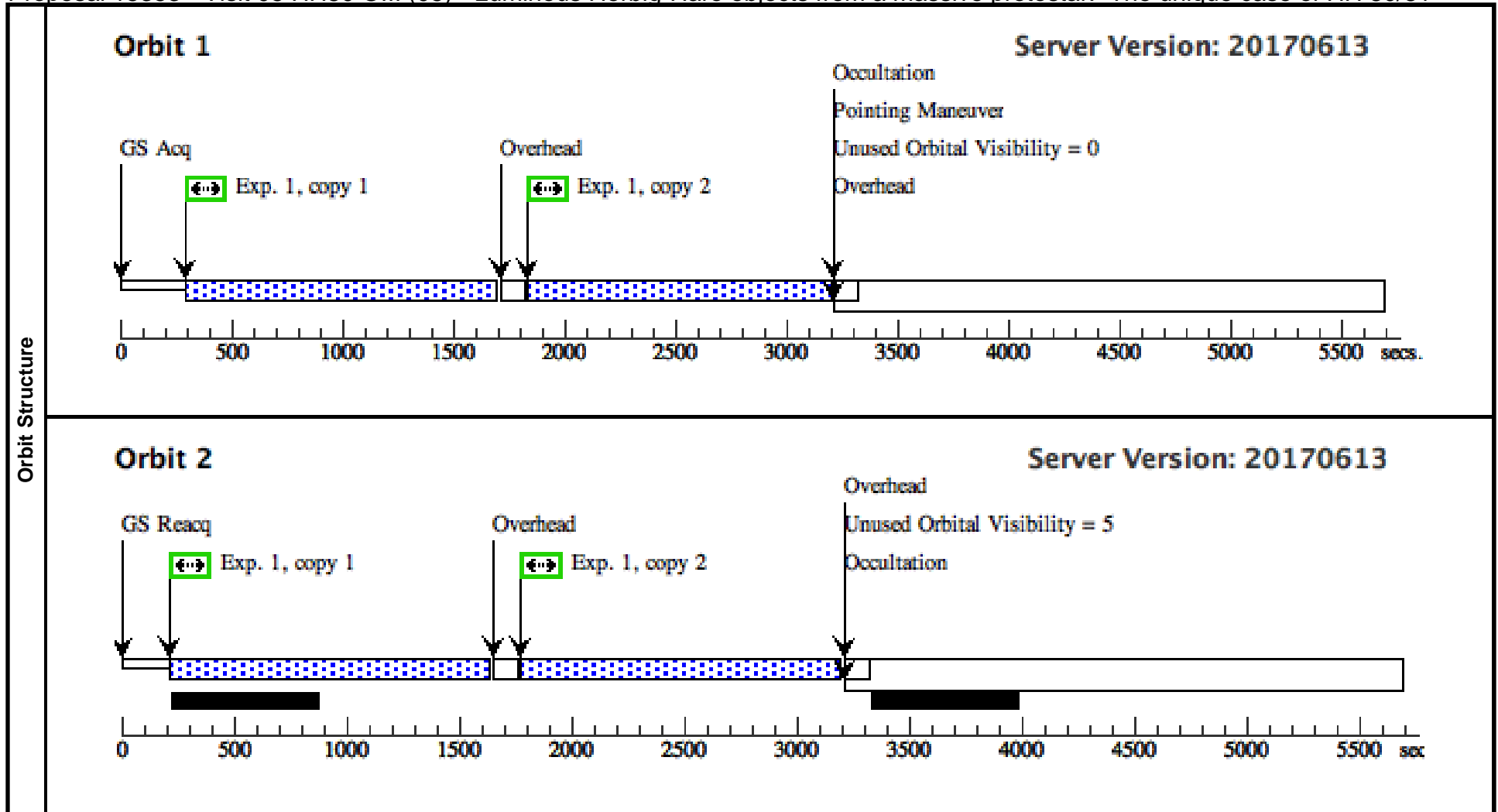
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) HH-80	WFC3/UVIS, ACCUM, UVIS-CENTER	F673N	FLASH=10		Pattern 1, Exps 1-1 in Visit 04 HH80 SII (04) (1)	1370 Secs (2742 Secs) [==>1371.0 Secs (Pattern 1)] [==>1371.0 Secs (Pattern 2)]	[1]



Proposal 15353 - Visit 05 HH80 OIII (05) - Luminous Herbig-Haro objects from a massive protostar: The unique case of HH 80/81

Tue Jul 18 14:08:17 GMT 2017

Visit	Proposal 15353, Visit 05 HH80 OIII (05) Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 110D TO 110 D Comments: First 2 orbits of F502N imaging with WFC3									
	Patterns	#	Primary Pattern				Secondary Pattern			Exposures
		(1)	Pattern Type=WFC3-UVIS-GAP-LINE Coordinate Frame=POS-TARG Purpose=DITHER Pattern Orientation=85.759 Number Of Points=2 Angle Between Sides= Point Spacing=2.414 Center Pattern=true Line Spacing=							(1)
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous		
	(1)	HH-80	RA: 18 19 6.3460 (274.7764417d) Dec: -20 51 27.90 (-20.85775d) Equinox: J2000				V=16	Reference Frame: SIMBAD		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	HH80 SII	(1) HH-80	WFC3/UVIS, ACCUM, UVIS-CENTER	F502N	FLASH=10		Pattern 1, Exps 1-1 i n Visit 05 HH80 OIII (05) (1)	1350 Secs X 2 (5590 Secs) [==>1371.0 Secs (Pattern 1, Copy 1)] [==>1371.0 Secs (Pattern 1, Copy 2)] [==>1424.0 Secs (Pattern 2, Copy 1)] [==>1424.0 Secs (Pattern 2, Copy 2)]	[1] [2]



Proposal 15353 - Visit 06 HH80 OIII (06) - Luminous Herbig-Haro objects from a massive protostar: The unique case of HH 80/81

Tue Jul 18 14:08:18 GMT 2017

Visit	Proposal 15353, Visit 06 HH80 OIII (06)		
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 110D TO 110 D Comments: 1 orbit of F502N imaging with WFC3		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(1)	Pattern Type=WFC3-UVIS-GAP-LINE Coordinate Frame=POS-TARG Purpose=DITHER Pattern Orientation=85.759 Number Of Points=2 Angle Between Sides= Point Spacing=2.414 Center Pattern=true Line Spacing=		(1)

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	HH-80	RA: 18 19 6.3460 (274.7764417d) Dec: -20 51 27.90 (-20.85775d) Equinox: J2000		V=16	Reference Frame: SIMBAD
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) HH-80	WFC3/UVIS, ACCUM, UVIS-CENTER	F502N	FLASH=10		Pattern 1, Exps 1-1 in Visit 06 HH80 OIII (06) (1)	1370 Secs (2742 Secs) [==>1371.0 Secs (Pattern 1)] [==>1371.0 Secs (Pattern 2)]	[1]

