13032 - Crossing the Snow Line: Mapping Ice Photodesorption products in the Disks of Herbig Ae-Fe stars

Cycle: 20, Proposal Category: GO

(Availability Mode: SUPPORTED)

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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) AB-AUR	STIS/CCD STIS/FUV-MAMA	1	19-Sep-2012 21:18:20.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
02	(2) HD-169142	COS/FUV COS/NUV	1	19-Sep-2012 21:18:30.0	yes
03	(2) HD-169142	STIS/CCD STIS/FUV-MAMA	2	19-Sep-2012 21:18:38.0	yes
04	(3) SAO-206462	STIS/CCD STIS/FUV-MAMA	2	19-Sep-2012 21:18:46.0	yes
05	(4) HD-142527	COS/FUV COS/NUV	1	19-Sep-2012 21:18:54.0	yes
06	(4) HD-142527	STIS/CCD STIS/FUV-MAMA	2	19-Sep-2012 21:19:01.0	yes

9 Total Orbits Used

ABSTRACT

Water is a key constitutent of protoplanetary disks. In our Solar System, small, icy grains are thought to have boosted the disk solid surface density, setting the stage for icy planetesimal formation and ultimately the growth of gas giant planets, while water vapor warms the disk, facilitating chemistry. Survival of water, in either phase, is sensitive to the UV radiation field. Intermediate-mass PMS stars, the Herbig Ae stars, straddle the temperature range where icy grains can survive within 10 AU of the star to systems where ice is photodesorbed at the disk surface to beyond 100 AU. Far-IR studies with Herschel have shown that, while water vapor is rarely detected for Herbig Ae stars, its dissociation products such as OH and O I are common. Such data lack the spatial resolution to directly constrain where water in any phase is located. An alternate approach exploits HST's superb angular resolution and disk-to-star contrast in the FUV using HST STIS long-slit spectroscopy. Such observations can map the spatial distribution of water's other dissociation product, H I at Lyman alpha, with 7 AU resolution. The same spectra also simultaneously trace molecular hydrogen and dust, enabling an additional test of whether the HI traces the dust or the molecular gas in these stratified disks. We propose obtaining STIS G140M spectra at Lyman alpha for 4 otherwise well-studied Herbig Ae-Fe stars to test the hypothesis that spatially extended H I in these systems provides a fossil record of where ice was located in the disk which can be compared with where giant planets are found in these disks.

OBSERVING DESCRIPTION

Targets: Our targets are Herbig Ae stars with Hershel PACS [O I] data, NIR and mid-IR imagery of the dust disk, known system inclinations, and known locations of the disk major and minor axes. Three stars (AB Aur: STIS O57Z04010; HD 169142: IUE SWP 55483/LWP 31285; SAO 206462: COS LB9901060, LB9901070, LB9901080) have archival FUV spectra, one (HD 142527) does not, but should resemble SAO 206462 at shorter wavelengths. The available spectral data, while useful for estimating count rates in our proposed observations have no spatial resolution and cannot be used to address our science goals. We propose obtaining STIS G140M long-slit data using the 52x0.2 slit used in prior observations of HD 100546.

Star	Sp.T.	Teff	Ref.	Disk Inclination	Phot. Range at V
AB Aur	A0Ve	9280	Roberge et al. 01	12-20 D	7.06-7.12
HD 169142	A5Ve	8400	Dunkin et al. 97	11+/-2	8.05-8.28
SAO 206462	F4Ve	6810+/-80	Dunkin et al. 97 Mueller et al. 11	13+/-2	8.7+/-0.1*
HD 142527	F6IIIe	6600K	Verhoeff et al. 2011	21+/-2	8.34-8.51

* Hipparcos data for this star refer to HD 135344, 21" from SAO 206462 along PA=17D

Exposure Durations:

Target 1 -- AB Aur: This A0Ve star is a rapid rotator, with Teff more typical of A2V stars. The star is incorrectly identified as B9neqIV-V by Shenavrin et al. (2011), but is more commonly, and historically, classified as A0Ve. The FUSE spectrum lacks the conspicuous C I absorption and FUV flux levels expected for a B9 star - instead the FUSE spectrum is a featureless continuum consistent with the accretion luminosity and emission lines. For source detection, the FUSE data restrict E(B-V)<0.1 with R=3.1. From the optical data, and adopting A0V, E(B-V)=0.12, which would normally obliterate Lyman alpha emission, yet STIS E140M data (Roberge et al. 2001) demonstrate that Ly is detected. For the STIS feasibility analysis, we used IUE SWP 50106, a low dispersion, large aperture spectrum with reasonable S/N (for IUE) at the shortest wavelengths as input data for the STIS exposure time calculations (ETC). Over 1145-1250 A, the accretion luminosity rather than the photosphere dominates. The STIS ETC (STIS.sp.360465) predicts that the the brightest pixel count rate is 0.116 c/s, with a global count rate from the source of 222 c/s and a background contribution of 234 c/s. Analysis of IUE archival data

indicates that the continuum shortward of 2000 A varies by a factor of 2 (Wassell PhD thesis 2009). These count rates are a factor of 42 below the limits for irregularly varying sources.
A 2 ks integration produces S/N33 for the continuum at 1230 A. The slit should be placed along the disk major axis (PA=45 degrees or orient=90 degrees).

STIS Target Acquisition: AB Aur has been successfully acquired by STIS using the F28x50OII filter previously. Our proposed integration will yield S/N~60, as well as a photometric point at 3741 A for SED modeling purposes. STIS.ta.415626 gives S/N=40 in 0.04s, we are requesting 0.1s integration time.

Target 2 -- HD 169142: This star has an optical spectral type of A5Ve (Dunkin et al. 1997) not the B9Ve listed on SIMBAD, with a slightly later type, A8Ve, in the UV (IUE SWP 55483), reflecting gravity darkening due to rapid rotation. Adopting (B-V)_0=0.17 for A5V, E(B-V)=0.09, which would normally affect Ly detection for R=3.1. However, inspection of the IUE SI browse file for SWP 55483 indicates the presence of a point source superposed on geocoronal Ly emission. The source was detected as the only source in the ACS SBC F122M field of view with a peak count rate well below the BOP limit (observation ids=J9JD02010, ..20, ..30, ..40), even given the red leak of this filter.

STIS target acquisition will use the F28x50OIII filter and will reach S/N=60 in 0.4s (for V=8.05, optical maximum light, STIS.ta.415634), as well as providing a photometric point at 5007 A for SED modeling.

The accretion luminosity for this star is 10× higher than for SAO 206462, but the emission lines appear comparable in strength. We have used several approaches to estimating the observed fluxes. 1) Use IUE data longward of 1700 A, but splice to SAO 206462 at shorter wavelengths, or use various scaled versions of the SAO 206462. Adopting SAO 206462 as a template spectrum, but scaling to the higher (continuum) accretion luminosity, we expect a peak count rate of 0.92 c/s at Ly, and a global count rate of 249.5 from the target, with 234.8 c/s from background sources, assuming average airglow. These count rates are more than an order of magnitude below the irregularly variable object bright object limits. In 4 ks, if the spectrum is at this level, we will achieve S/N=15 at 1230 A. S/N estimates using a simple splice of the SAO 206462 COS data shortward of 1700 A onto the IUE data result in S/N estimates a factor of 3 lower, again with no BOP issues and with S/N adequate for our scientific purposes.

We plan 2 STIS orbits for this STIS G140M spectra of this star, but with a precursor COS orbit (see below) to check our estimates. The slit should be placed to cross the bright arc at PA=115±10 degrees, orient=160 degrees. At this PA, the 9.2 separation T Tauri companions to HD 169142 will not be in the slit.

COS Precursor Spectra for HD 169142:
A single orbit is allocated for the COS observations. We propose obtaining COS G130M spectra, with segments centered at 1291, 1309, and 1327 (two FP-POS settings) using 380 - 400 second individual exposures, to confirm the IUE detection of Ly. It is impossible to acquire spectra at all four FP-POS psoitions for each setting --- such a scenario results in catastrophic overheads and minimal exposure time. Our proposed observing sequence results in three independent spectra contributing at all wavelengths and minimizes the influence of the detector gap. Using the same source assumptions as for STIS, each of the exposures will provide spectra with S/N ~40 at the peaks of the C II 1334/5 A doublet, O I 1302/4/6 triplet, and H Lyman alpha (ETC COS.sp.412308). The brightest pixel in COS G130M segment B is at OI and is expected to produce a count rate of 0.17 c/s. For segment A, the peak count rate is at C II, and is 0.13 c/s. All spectra are well under the local and global bright limits. The total on-source exposure time will be 1560 seconds. The COS target acquisition will use MIRRORB and the BOA --- a 90 second exposure is required to achieve a peak S/N of 60 with the brightest pixel count rate being 5.4 c/s (COS.ta.412253).

Target 3 -- SAO 206462 (HD 135344B): This object has spectral types of F4-F8Ve in the literature, which may be due to its critical rotation (Mueller et al. 2011). Foreground extinction, measured from the V=7.05, A0V star HD 135344, 21 to the north, is E(B-V)=0.07 and is expected to apply to SAO 206462. The COS spectrum has a faint continuum (2x1015 erg cm2 s1 A) and a rich emission-line spectrum with Ly the brightest line (peak flux of 2.5x1013 erg/cm2/ s1 A). This spectrum, binned to 0.1 A and with geocoronal Ly removed was used for STIS exposure estimation (STIS.sp.378175). The peak count rate for this source is 0.092 c/s at 1217.45 A and the total source count rate is 0.151 c/s (STIS.sp.360012), well below bright object limits. In 4ks the S/N per spectral resolution element at 1230 A is ~5 , at N V 1238 A it is22 and at SiIII1206 A it is17. Neither the N V nor SiIII are expected to be spatially extended, so we will concentrate the reflection nebulosity studies at those wavelengths and bin the H2 emission to improve the S/N. We are requesting two orbits for the STIS observation. We will place the slit aligned along the disk major axis (PA=55 degrees, orient=100 degrees). HD 135344 (A0V, V=7.05) will be out of the slit with this orient.

STIS Target Acquisition: We will achieve S/N=60 using F28x50OIII at optical maximum light for
this system, as well as a photometric data point at 5007 A for SED modeling with 0.6s integration time (STIS.ta.415638).

Target 4 -- HD 142527: The spectral type on SIMBAD is F6IIIe, with AV =0.6, corresponding to E(B-V)=0.19 if R=3.1 (unlikely) to 0.12 (R=5,

typical of molecular clouds and similar to AB Aur). There are no UV spectra for this star. We request precursor COS G130M spectra to confirm that Ly is detectable, and that our flux estimate based on SAO 206462 is valid. We assume that the spectrum is similar to HR 6077 (F 6 III, IUE SWP 36874), but with a spectrum at short wavelengths like SAO 206462, but scaled up by 5 times. We conservatively assume no additional extinction for exposure estimates. For STIS, we expect a peak local count rate at 1217 A of 0.45 c/s, and a global count rate of 0.755 c/s again, both well under the bright object limit. We propose an integration of 4 ks, yielding S/N=42 at Ly, and S/N 28 at 1230 Aat the star. Our preferred PA of 90 degrees is unschedulable. We therefore propose placing the STIS long-slit along PA=255-265/75-85 degrees, Orient=300-310 degrees where it will cross structure seen in NICMOS F110W coronagraphic imagery.

STIS Target Acquisition: We are requesting 0.4s integrations using F28x50OIII for STIS acquisition which will yield S/N=60 if HD 142527 is at optical maximum light, and still be above S/N=40 if the star is closer to V=8.51 (Hipparcos minimum light). As for our other targets observed at this wavelength, the signal in this band will also provide a photometric point for SED modeling. For details see STIS.ta.411085.

COS spectra for HD 142527:
We are also requesting that the STIS spectrum be preceded by a single orbit with COS G130M spectra with the same central wavelengths settings as for HD 169142. We expect that the source count rates will be half of those for HD 169142 unless the extinction and N(H I) are higher. Using the same source assumptions as for STIS and individual exposure times of 425 - 450 seconds, each of the exposures will provide spectra with S/N ~35 at the peaks of the C II 1334/5 A doublet and O I 1302/4/6 triplet, and ~30 for the peak of H Lyman alpha (ETC COS.sp.412311). The brightest pixel in COS G130M segment B is at Lyman alpha and is expected to produce a count rate of 0.10 c/s. For segment A, the peak count rate is at C II, and is 0.07 c/s. All spectra are again well under the local and global bright limits. The total on-source exposure time will be 1775 seconds. The target acquisition will use MIRRORA and the BOA --- a ~10 second exposure is required to achieve a peak S/N of 40 with the brightest pixel count rate being 31 c/s (COS.ta.412261).

REAL TIME JUSTIFICATION
N/A

CALIBRATION JUSTIFICATION
Calibration Needs: We require no special calibrations, if the cycle 20 calibration plan includes observation of at least one UV standard star at or near Ly with STIS G140M.

ADDITIONAL COMMENTS

We require coordinated photometry and spectrophotometry for our STIS FUV observations, and prefer that our STIS observations be scheduled during plan windows where ground-based photometry is feasible. Coordination with the COS windows is not critical: getting the COS data at least 60 days prior to the STIS windows is critical.

Visit

Proposal 13032, AB Aur (01), implementation Thu Sep 20 01:19:08 GMT 2012

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%; ORIENT 88.D TO 92. D; AFTER 31-JAN-2013

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	AB-AUR	RA: 04 55 45.8452 (73.9410217d)	Proper Motion RA: 2.63 mas/yr	V=7.09+/-0.03	Reference Frame: ICRS
	Alt Name1: HD-31293	Dec: +30 33 4.29 (30.55119d)	Proper Motion Dec: -24.73 mas/yr	B=7.18+/-0.03. Star is typically near V=7.06-7.08 but can irregularly drop to 7.12 F	
	Alt Name2: HIP-22910	Equinox: J2000	Parallax: 0.00718"		
			Epoch of Position: 2000		

Comments: Spectral type for AB Aur is A0V (Simbad has recently updated to B9 which is inconsistent with IUE, HST STIS, and FUSE data). A0V covers a large range in T_eff (Gerbaldi et al. 1999), and AB Aur is cool for the spectral type, and in the UV resembles objects with spectral types of A2V. The STIS E140M data in the wavelength range near Lyman alpha are shown in Roberge et al. (2001).

Radial velocity 8+/-5 km/s

Proper motion data are from van Leeuwen (2007), errors are 1+/-1.08, 0.6 mas/yr and in general agreement with UCAC3 (Zacharias et al. 2010). Target has previously been successfully observed in optical and FUV by STIS.

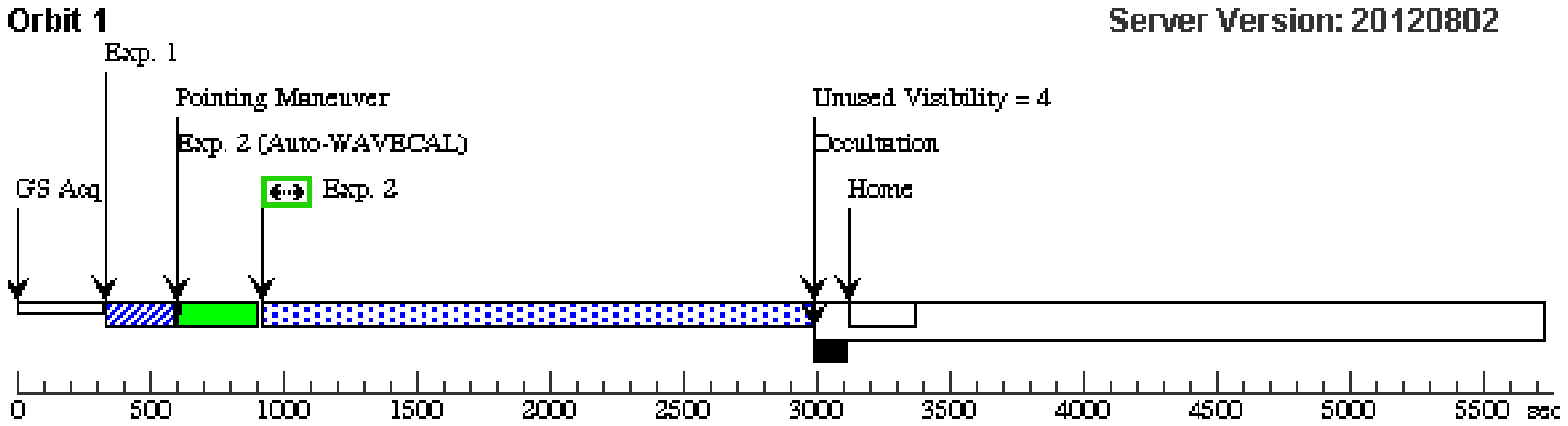
Photometric range seen by Hipparcos is V =7.06-7.12

Target data taken from Simbad. UV Flux measures from STIS (Ly alpha0 and GHRS (N V).

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	(411060)	(1) AB-AUR	STIS/CCD, ACQ, F28X50OII	MIRROR				0.1 Secs	
								[==>]	***[1]***
2	(STIS.sp.360465)	(1) AB-AUR	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1218 A				2040. Secs	
								[==>]	***[1]***

Orbit Structure



Visit

Proposal 13032, HD169142-prep (02), implementation Thu Sep 20 01:19:10 GMT 2012

Diagnostic Status: Warning

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: SCHED 100%

Diagnostics

(HD169142-prep (02)) Warning (Form): If the target coordinates are not known to 0.4" (or better) an ACQ/SEARCH should precede the ACQ/IMAGE.

(HD169142-prep (02)) Warning (Form): For the best data quality, it is strongly recommended that all four FP-POS positions be used when observing at a given COS CENWAVE setting.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HD-169142	RA: 18 24 29.7787 (276.1240779d)	Proper Motion RA: -2.1 mas/yr	V=8.15+/-0.13	Reference Frame: ICRS
	Alt Name1: SAO-186777	Dec: -29 46 49.37 (-29.78038d)	Proper Motion Dec: -40.2 mas/yr	B=8.41.	
		Equinox: J2000	Epoch of Position: 1991.25		

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Spectral type is A5Ve, as discussed in Dunkin et al. (1997) MNRAS 286, 604 NOT the B9V listed on SIMBAD.

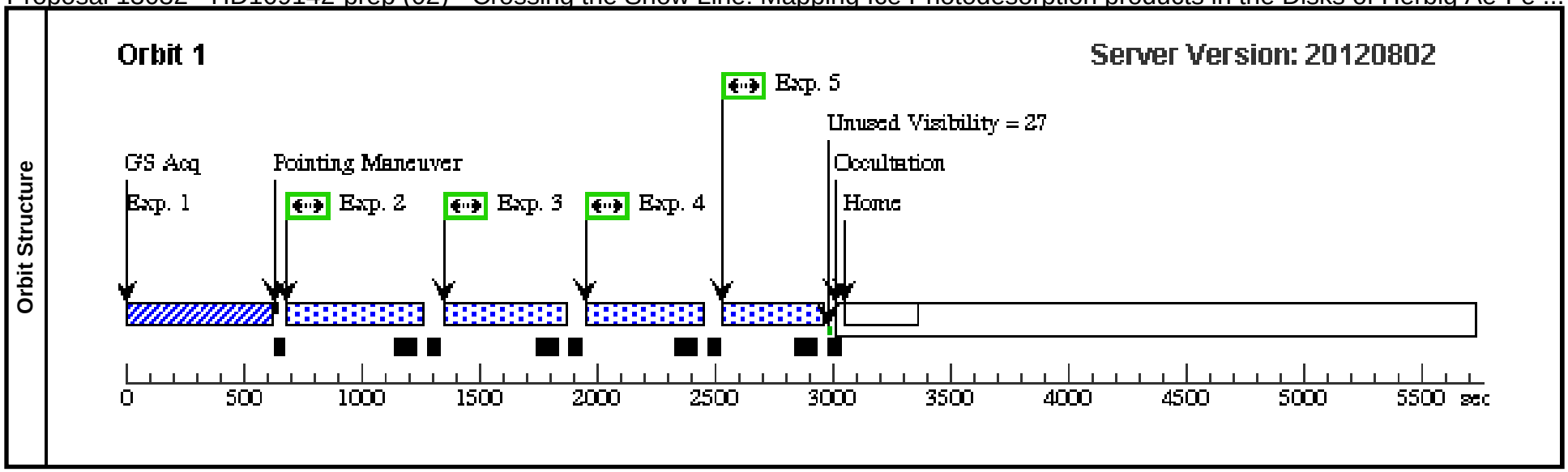
Proper motion data come from Hog et al. (2000) and are listed on SIMBAD. They give a mean epoch of 1991.25 for proper motion. PM data are in full agrement with UCAC3 (Zacharias et al. 2010).

Hipparcos search facility gives a range in V of 8.05 to 8.28 (0.13 mag about the Johnson magnitude of 8.15).

There are no tabulated parallax data on Simbad. Assumption in literature is d=145 pc.

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	(412253)	(2) HD-169142	COS/NUV, ACQ/IMAGE, BOA	MIRRORB				90.0 Secs	
								[==>]	***[1]***
2	(412308)	(2) HD-169142	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=290; FP-POS=1			400 Secs	
								[==>]	***[1]***
3	(412308)	(2) HD-169142	COS/FUV, TIME-TAG, PSA	G130M 1309 A	BUFFER-TIME=290; FP-POS=1			400 Secs	
								[==>]	***[1]***
4	(412308)	(2) HD-169142	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=270; FP-POS=1			380 Secs	
								[==>]	***[1]***
5	(412308)	(2) HD-169142	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=270; FP-POS=3			380 Secs	
								[==>]	***[1]***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Exp. 5
Unused Visibility = 27
GS Acq
Exp. 1
Pointing Maneuver
Exp. 2
Exp. 3
Exp. 4
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13032, HD169142-FUV-STIS (03), implementation Thu Sep 20 01:19:11 GMT 2012

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%; ORIENT 45.D TO 55. D; AFTER 02 BY 60 D TO 420 D

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HD-169142	RA: 18 24 29.7787 (276.1240779d)	Proper Motion RA: -2.1 mas/yr	V=8.15+/-0.13	Reference Frame: ICRS
	Alt Name1: SAO-186777	Dec: -29 46 49.37 (-29.78038d)	Proper Motion Dec: -40.2 mas/yr	B=8.41.	
		Equinox: J2000	Epoch of Position: 1991.25		

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Spectral type is A5Ve, as discussed in Dunkin et al. (1997) MNRAS 286, 604 NOT the B9V listed on SIMBAD.

Proper motion data come from Hog et al. (2000) and are listed on SIMBAD. They give a mean epoch of 1991.25 for proper motion. PM data are in full agrement with UCAC3 (Zacharias et al. 2010).

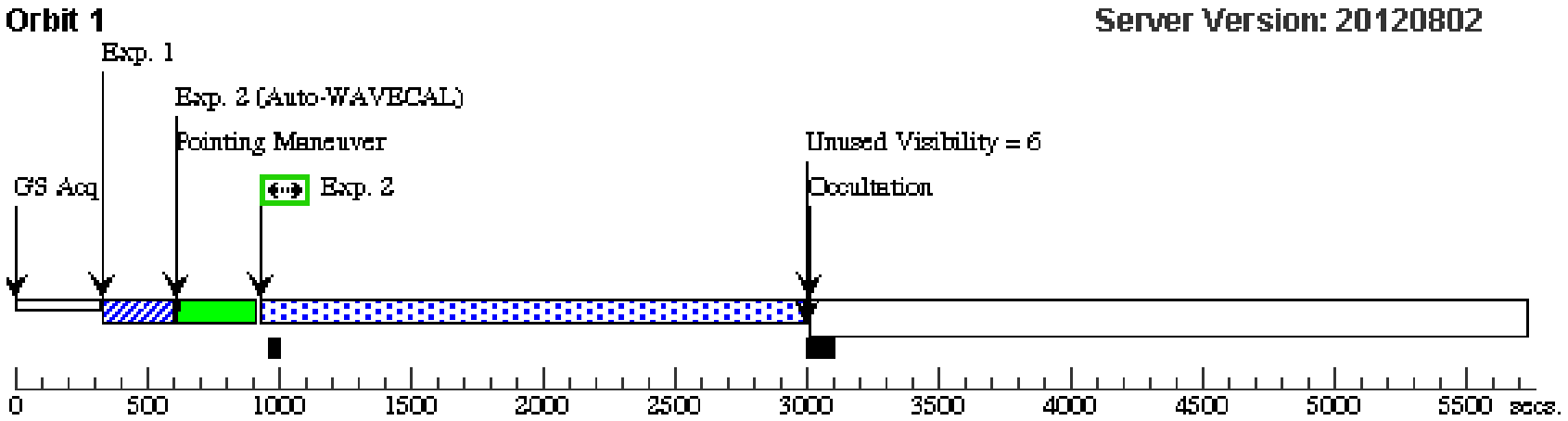
Hipparcos search facility gives a range in V of 8.05 to 8.28 (0.13 mag about the Johnson magnitude of 8.15).

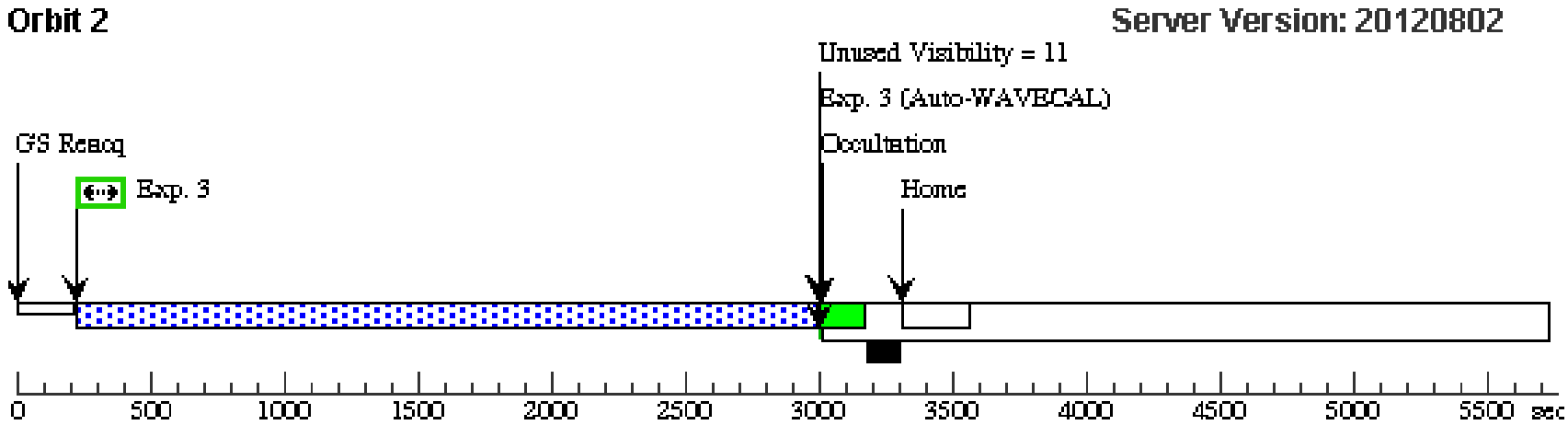
There are no tabulated parallax data on Simbad. Assumption in literature is d=145 pc.

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	(411065)	(2) HD-169142	STIS/CCD, ACQ, F28X50OIII	MIRROR				0.4 Secs	
								[==>]	***[1]***
2	(411546)	(2) HD-169142	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1218 A				2040 Secs	
								[==>]	***[1]***
3	(411546)	(2) HD-169142	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1218 A				2750 Secs	
								[==>]	***[2]***

Orbit Structure





Visit

Proposal 13032, SAO206462-FUV-STIS (04), implementation Thu Sep 20 01:19:15 GMT 2012

Diagnostic Status: No Diagnostics

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

Special Requirements: SCHED 100%; ORIENT 98D TO 102 D; AFTER 01-FEB-2013

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	SAO-206462	RA: 15 15 48.4394 (228.9518308d)	Proper Motion RA: -19.7 mas/yr	V=8.708+/-0.25	Reference Frame: ICRS
	Alt Name1: HD-135344B	Dec: -37 09 16.03 (-37.15445d)	Proper Motion Dec: -24.0 mas/yr	B=9.206+/-0.022,	
		Equinox: J2000	Epoch of Position: 1991.25	R=8.7	

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

Proper motion data are from Hog et al. (2000) with a mean epoch of 1991.25
No parallax is given for this object by SIMBAD, but distance in literature is 145 pc.

Target has previously been successfully observed by HST STIS, NICMOS and ACS SBC.

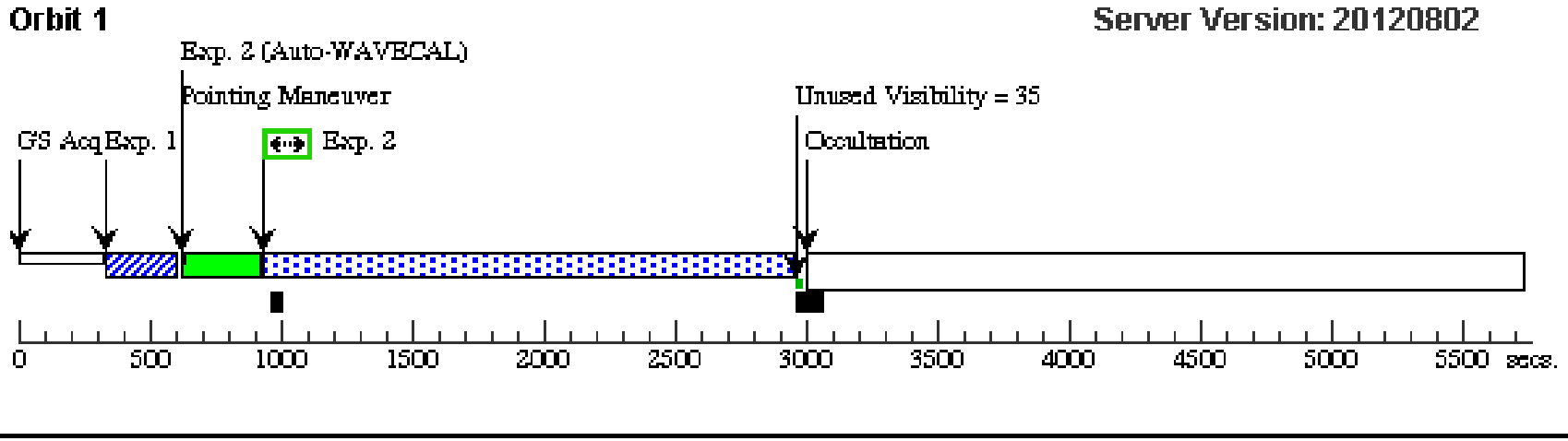
Star has HD 135344 (A0V, V=7.76) 21" to the NNE; Hipparcos links to this star rather than to SAO 206462.

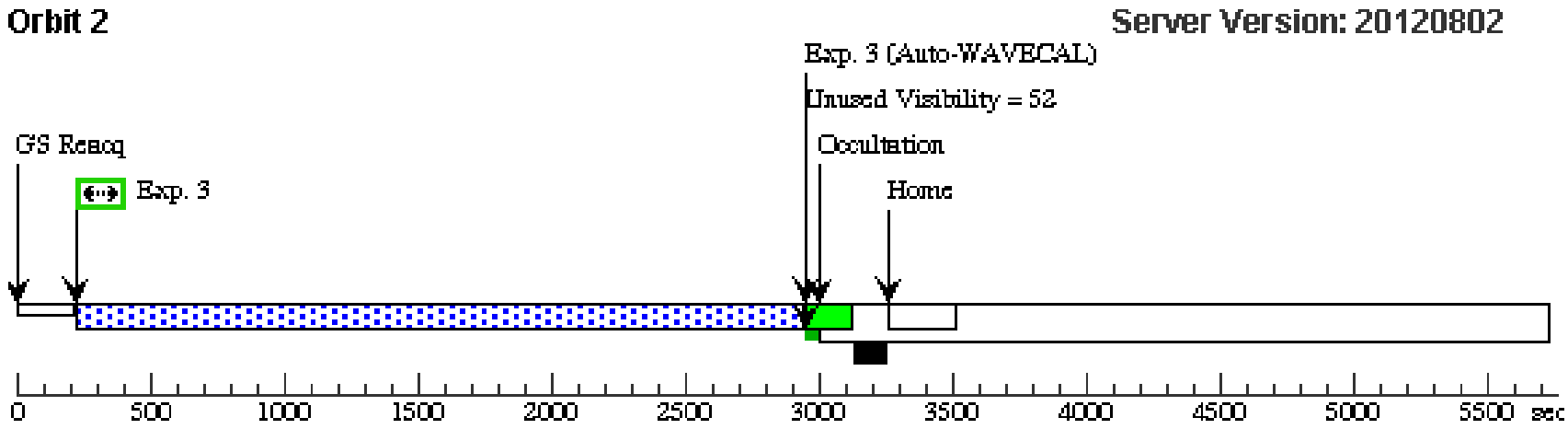
The Hipparcos Search Facility gives a photometric range for this object of 8.45-

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	(411067)	(3) SAO-206462	STIS/CCD, ACQ, F28X50OIII	MIRROR				0.6 Secs	
								[==>]	***[1]***
2	(411547)	(3) SAO-206462	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1218 A				2000 Secs	
								[==>]	***[1]***
3	(411547)	(3) SAO-206462	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1218 A				2700 Secs	
								[==>]	***[2]***

Orbit Structure





Visit

Proposal 13032, HD142527-prep (05), implementation Thu Sep 20 01:19:17 GMT 2012

Diagnostic Status: Warning

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: SCHED 100%; ORIENT 240D TO 270 D

Diagnostics

(HD142527-prep (05)) Warning (Form): For the best data quality, it is strongly recommended that all four FP-POS positions be used when observing at a given COS CENWAVE setting.

(HD142527-prep (05)) Warning (Form): If the target coordinates are not known to 0.4" (or better) an ACQ/SEARCH should precede the ACQ/IMAGE.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	HD-142527	RA: 15 56 41.8899 (239.1745412d)	Proper Motion RA: -11.19 mas/yr	V=8.42+/-0.1	Reference Frame: ICRS
	Alt Name1: HIP-78092	Dec: -42 19 23.27 (-42.32313d)	Proper Motion Dec: -24.46 mas/yr	V =8.34,	
	Alt Name2: SAO-226389	Equinox: J2000	Parallax: 0.00429"	B=9.04	
			Epoch of Position: 2000		

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Distance estimate from parallax is 233 pc.

Proper motion data are from van Leeuwen (2007), and are +/-0.93, and 0.79 mas/year . Epoch is assumed to be 1991.25. general agrement with proper motion data from UCAC3 (Zacharias et al. 2010).

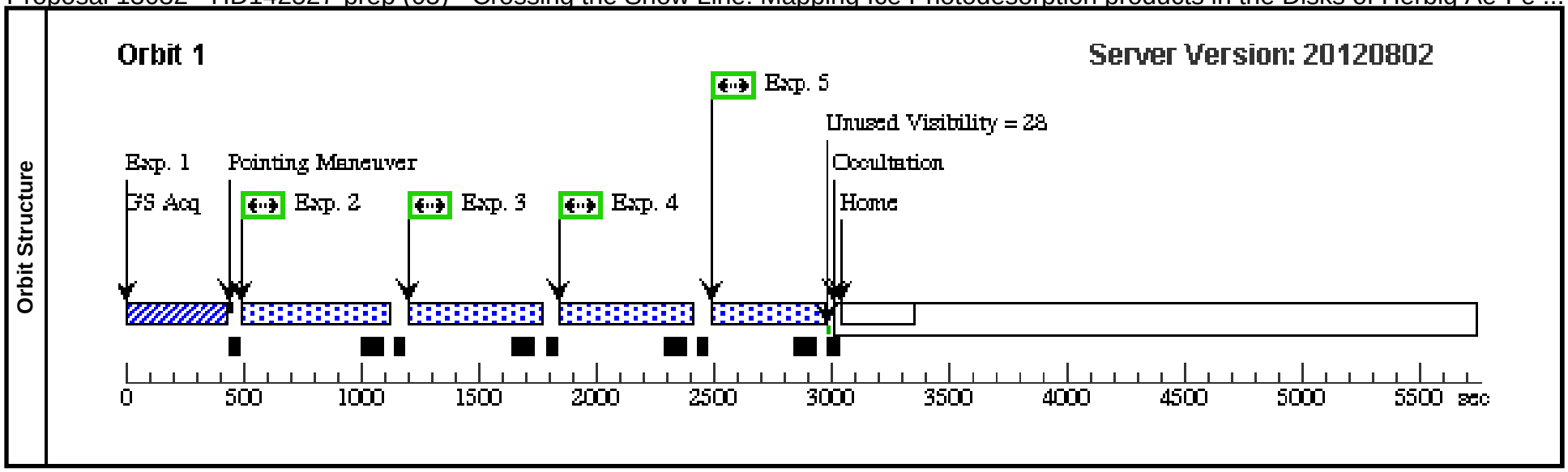
Hipparcos search facility has a photometric annex for this star and found gradual excursions between 8.41 and 8.51. Star is not listed in ASAS (not variable enough?).

Radial velocity -3.5 +/-0.8 km/s

Target has previously been observed by HST NICMOS

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	(412261)	(4) HD-142527	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				10 Secs	
								[==>]	***[1]***
2	(412311)	(4) HD-142527	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=340; FP-POS=1			450 Secs	
								[==>]	***[1]***
3	(412311)	(4) HD-142527	COS/FUV, TIME-TAG, PSA	G130M 1309 A	BUFFER-TIME=340; FP-POS=1			450 Secs	
								[==>]	***[1]***
4	(412311)	(4) HD-142527	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=340; FP-POS=1			450 Secs	
								[==>]	***[1]***
5	(412311)	(4) HD-142527	COS/FUV, TIME-TAG, PSA	G130M 1327 A	BUFFER-TIME=315; FP-POS=3			425 Secs	
								[==>]	***[1]***


Orbit Structure
Orbit 1
Server Version: 20120802
Exp. 5
Unused Visibility = 28
Exp. 1
Pointing Maneuver
Occultation
GS Acq
Exp. 2
Exp. 3
Exp. 4
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13032, HD142527-FUV-STIS (06), implementation Thu Sep 20 01:19:18 GMT 2012

Diagnostic Status: No Diagnostics

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

Special Requirements: ORIENT 300D TO 310 D; AFTER 05 BY 60 D TO 420 D

Fixed Targets

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	Alt Name1: HIP-78092	Dec: -42 19 23.27 (-42.32313d)	Proper Motion Dec: -24.46 mas/yr	V =8.34,	
	Alt Name2: SAO-226389	Equinox: J2000	Parallax: 0.00429"	B=9.04	
			Epoch of Position: 2000		

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Distance estimate from parallax is 233 pc.

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Radial velocity -3.5 +/-0.8 km/s

Target has previously been observed by HST NICMOS

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	(STIS.ta.411085)	(4) HD-142527	STIS/CCD, ACQ, F28X50OIII	MIRROR				0.4 Secs	
								[==>]	***[1]***
2	(411571)	(4) HD-142527	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1218 A				2350. Secs	
								[==>]	***[1]***
3	(411571)	(4) HD-142527	STIS/FUV-MAMA, ACCUM, 52X0.2	G140M 1218 A				3080. Secs	
								[==>]	***[2]***

Orbit Structure