14759 - What Happens in the Atmospheres of Hot Horizontal Branch Stars Near 20,000K?

Cycle: 24, Proposal Category: GO

(UV Initiative)

(Availability Mode: AVAILABLE)

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) NGC5139-PAIR1 (4) NGC5139-ACQ ANY	STIS/CCD STIS/NUV-MAMA WFC3/UVIS	2	29-Jul-2016 15:17:37.0	yes
02	(2) NGC5139-PAIR2 (4) NGC5139-ACQ ANY	STIS/CCD STIS/NUV-MAMA WFC3/UVIS	2	29-Jul-2016 15:17:40.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
03	(3) NGC5139-PAIR3 (4) NGC5139-ACQ ANY	STIS/CCD STIS/NUV-MAMA WFC3/UVIS	2	29-Jul-2016 15:17:43.0	yes

6 Total Orbits Used

ABSTRACT

In the color-magnitude diagrams (CMDs) of many globular clusters, the horizontal branch (HB) exhibits a long blue tail extending to high effective temperatures. In such clusters, two discontinuities appear within the HB locus. The first discontinuity occurs at ~12,000K, and was discovered by Grundahl et al. (1998). It is associated with the radiative levitation of metals and the gravitational settling of helium in the atmospheres of HB stars hotter than 12,000K. The hot subdwarf stars of the Galactic field population exhibit the same phenomenon. The second discontinuity occurs at ~20,000K, and was discovered by Momany et al. (2002). Its origin is unknown, but it appears at the same effective temperature in all globular clusters hosting HB stars near 20,000K, regardless of cluster properties (age, chemical composition, mass, etc.). We propose STIS long-slit spectroscopy of 6 HB stars that straddle this feature in the HB distribution of omega Cen, the nearest globular cluster where the feature is well populated. With this approach, we can efficiently obtain high-quality UV and blue spectra that span the full wavelength range of the photometric bands where this CMD feature is most prominent - a range this is only accessible by HST. The resulting spectra will unambiguously reveal the nature of this phenomenon - one that is universal in the atmospheres of hot evolved stars - and will yield new insight into the role of diffusion and radiative levitation in these stars.

OBSERVING DESCRIPTION

Our observations are straightforward, and similar to previous programs that also obtained UV spectroscopy of hot stars in the core of Galactic globular clusters with parallel broad- band imaging in the outskirts (e.g., GO-11665). We will obtain long-slit near-UV (NUV/G230L) and blue (CCD/G430L) STIS spectroscopy of omega Cen using the 52x0.5" slit, which will be truncated at a length of 25" in the NUV observations. Each slit position will center a pair of EHB stars along the slit axis, with dithering along the slit to remove detector artifacts. Each pair will include one star falling immediately to the blue of the M-jump and one star falling immediately to the red of the M-jump. Although each slit position has its own specific orientation, the Visit Planner shows ample schedulability at a distinct time of year for each position. The three 2-orbit visits are independent of each other, and 2-orbit visits present no scheduling challenges (unlike 4- or 5-orbit visits). We will offset to these three slit positions after an acquisition on an isolated bright star further from the cluster center. The offsets can be determined to high accuracy using extant HST imaging of the

cluster. The extensive UV imaging also ensures the field is safe to observe, providing UV brightnesses and colors for all objects in the vicinity of our slit positions. The brightest star in the vicinity of each NUV/G230L observation is noted in the comments for each visit.

The photometric catalogs of omega Cen enable accurate determination of the spectral quality we would obtain in these observations. For 5 of our targets, we will obtain a signal-to-noise ratio of ~30 per resolution element in the near-UV (where the metal absorption lines are most prominent), and ~100 per resolution element in the optical (for the Balmer lines and break). For the faintest target, these numbers will be 20 and 80, respectively. Although the field is crowded, the 52x0.5" slit is sufficiently narrow to exclude objects in the dispersion direction that would contaminate our spectra. These spectra would unambiguously characterize the spectral features responsible for the M-jump, given that the M-jump manifests itself as a ~10% change in a broad-band photometric color index.

In parallel to the STIS spectroscopy, we will obtain WFC3 photometry in the same 3 filters of the UV Treasury survey of Galactic globular clusters (GO-13297; F275W, F336W, and F438W). The dithering of the prime STIS observations will only be in one axis, so the offsets will not be sufficient for resampling of the point spread function in these images, but they will enable removal of detector artifacts.

In each visit, we perform a target acquisition on a relatively isolated star, and then offset to the site of the spectroscopic observations. The offset must not incur a change in guide stars, in order to place the targets accurately in the long STIS slit. If the offset employed in any of the three visits cannot be achieved on a single set of guide stars, due to the size of the offset, we can search for acquisition stars tailored to be nearby each of the three slit positions, but we would prefer to use the same acquisition star for all three visits. Once the offset executes in a given visit, we will obtain an image through the slit, prior to the spectroscopy, to characterize source placement within the slit and inform the data reduction.

Visit

Proposal 14759, Visit 01 Fri Jul 29 19:17:44 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, STIS/NUV-MAMA, STIS/CCD

Special Requirements: ORIENT 83.5D TO 83.5 D; ORIENT 263.5D TO 263.5 D

Comments: Brightest star in F275W within 40 arcsec radius of the slit center in the NUV images is at RA = 13:26:35.5395, Dec = -47:28:29.998. It has m275=13.9 vegamag. Although this star should not fall within the slit, if it did, it would be safe to observe in NUV/G230L.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC5139-PAIR1	RA: 13 26 36.6011 (201.6525046d) Dec: -47 28 26.36 (-47.47399d) Equinox: J2000		V=17.1+/-0.2 m275=15.6 vegamag	Reference Frame: ICRS

Comments: The coordinates above fall midway between the pair of stars.
Coordinates come from HLA image, but shifted to agree with position of acquisition star in HSC, 2MASS, and GSC, which all agree to within a few WFC3/UVIS pixels in the HLA image.
In the native HLA image (WFC3/F275W or WFC3/F814W), the position would be 13 26 36.8237 -47 28 27.02. This can be used to see the slit placement in Aladin.

The photometric information above is for the fainter of the two stars in the slit (specifically, the southwestern star in the pair), as determined in the F275W HLA image of the cluster.

The other star in the pair has the following photometry:
V=16.6
m275 = 15.4 vegamag

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	NGC5139-ACQ	RA: 13 26 45.3280 (201.6888667d) Dec: -47 29 16.87 (-47.48802d) Equinox: J2000		V=13.3+/-0.5	Reference Frame: ICRS

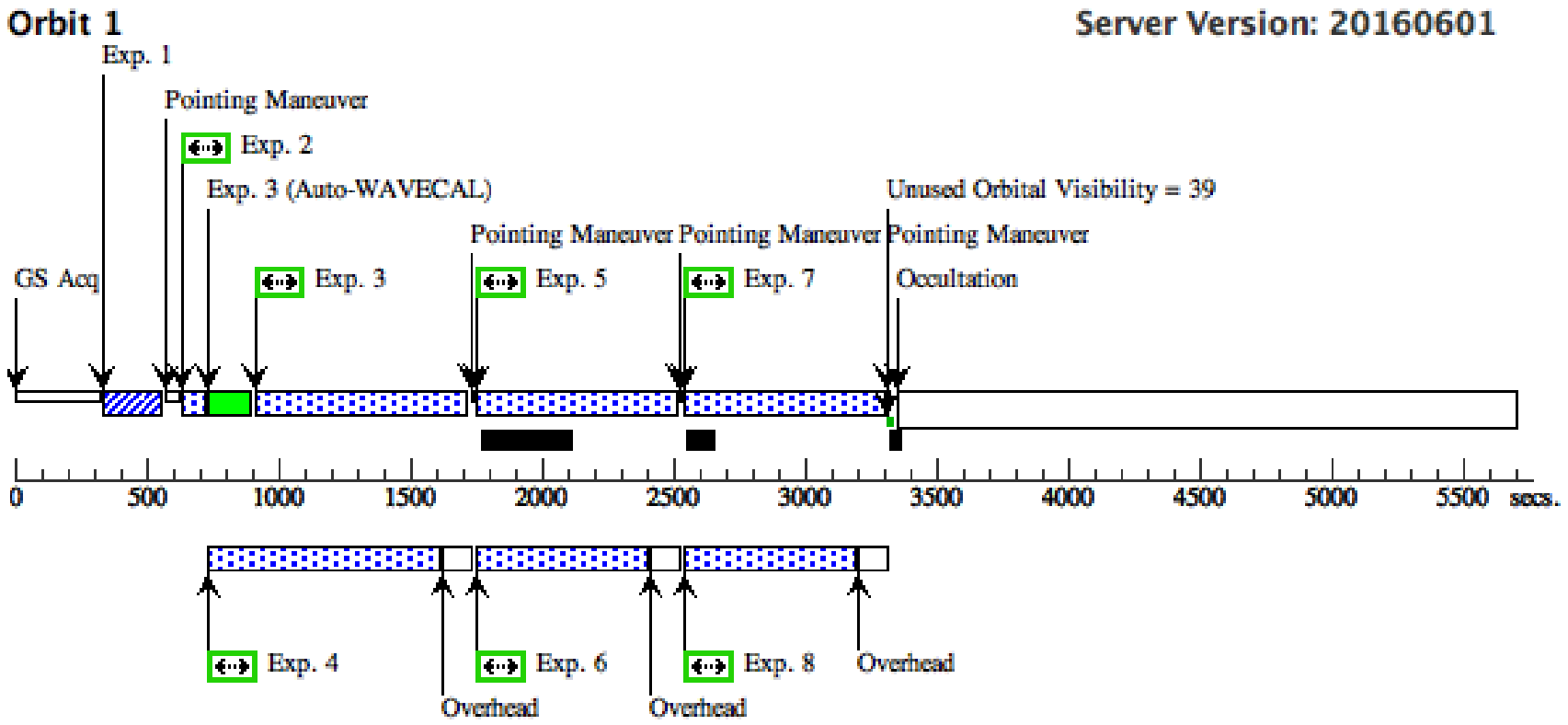
Comments: V-magnitude comes from inspection of HLA WFPC2/F555W image. Aperture photometry on this image implies V=13.05 mag. HSC says m555=13.55 mag. Anywhere in this range will be fine for acquisition, regardless of spectral type (M to O), providing SNR>40 and well below saturation.

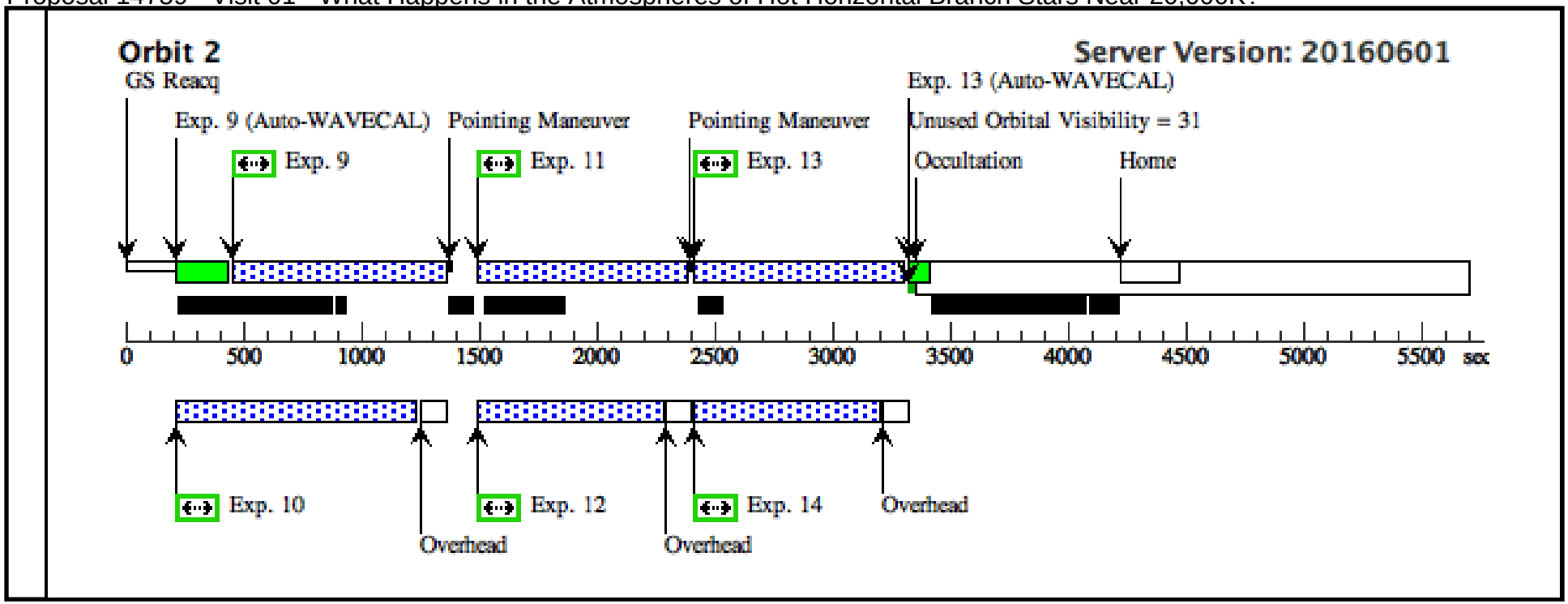
Coordinates come from HLA image, but shifted to agree with position of acquisition star in HSC, 2MASS, and GSC, which all agree to within a few WFC3/UVIS pixels in the HLA image.
In the native HLA image (WFC3/F275W or WFC3/F814W), the position would be 13 26 45.5506 -47 29 17.53. This can be used to see the ACQ placement in Aladin.
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) NGC5139-ACQ	STIS/CCD, ACQ, F28X50LP	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***
2		(1) NGC5139-PAIR 1	STIS/CCD, ACCUM, 52X0.5	MIRROR	CR-SPLIT=NO; GAIN=4	POS TARG null,0		2 Secs (2 Secs)	
								[==>]	***[1]***
Comments: Image through the slit to help characterize position of sources relative to slit midline.									
3	(STIS.sp.820077)	(1) NGC5139-PAIR 1	STIS/CCD, ACCUM, 52X0.5	G430L 4300 A	CR-SPLIT=NO	POS TARG null,0	Prime + Parallel Group 3-4 in Visit 01	720 Secs (720 Secs)	
								[==>]	***[1]***
4		ANY	WFC3/UVIS, ACCUM, UVIS	F275W	FLASH=12		Prime + Parallel Group 3-4 in Visit 01	850 Secs (850 Secs)	
								[==>]	***[1]***
5	(STIS.sp.820077)	(1) NGC5139-PAIR 1	STIS/CCD, ACCUM, 52X0.5	G430L 4300 A	CR-SPLIT=NO	POS TARG null,0.2	Prime + Parallel Group 5-6 in Visit 01	720 Secs (720 Secs)	
								[==>]	***[1]***
6		ANY	WFC3/UVIS, ACCUM, UVIS	F336W	FLASH=12		Prime + Parallel Group 5-6 in Visit 01	630 Secs (630 Secs)	
								[==>]	***[1]***
7	(STIS.sp.820077)	(1) NGC5139-PAIR 1	STIS/CCD, ACCUM, 52X0.5	G430L 4300 A	CR-SPLIT=NO	POS TARG null,-0.2	Prime + Parallel Group 7-8 in Visit 01	720 Secs (720 Secs)	
								[==>]	***[1]***
8		ANY	WFC3/UVIS, ACCUM, UVIS	F438W	FLASH=7		Prime + Parallel Group 7-8 in Visit 01	630 Secs (630 Secs)	
								[==>]	***[1]***
9	(STIS.sp.820077)	(1) NGC5139-PAIR 1	STIS/NUV-MAMA, ACCUM, 52X0.5	G230L 2376 A		POS TARG null,0	Prime + Parallel Group 9-10 in Visit 01	877 Secs (877 Secs)	
								[==>]	***[2]***
10		ANY	WFC3/UVIS, ACCUM, UVIS	F438W	FLASH=4		Prime + Parallel Group 9-10 in Visit 01	1025 Secs (1025 Secs)	
								[==>]	***[2]***
11	(STIS.sp.820077)	(1) NGC5139-PAIR 1	STIS/NUV-MAMA, ACCUM, 52X0.5	G230L 2376 A		POS TARG null,0.2	Prime + Parallel Group 11-12 in Visit 01	877 Secs (877 Secs)	
								[==>]	***[2]***
12		ANY	WFC3/UVIS, ACCUM, UVIS	F275W	FLASH=12		Prime + Parallel Group 11-12 in Visit 01	765 Secs (765 Secs)	
								[==>]	***[2]***
13	(STIS.sp.820077)	(1) NGC5139-PAIR 1	STIS/NUV-MAMA, ACCUM, 52X0.5	G230L 2376 A		POS TARG null,-0.2	Prime + Parallel Group 13-14 in Visit 01	877 Secs (877 Secs)	
								[==>]	***[2]***
14		ANY	WFC3/UVIS, ACCUM, UVIS	F336W	FLASH=12		Prime + Parallel Group 13-14 in Visit 01	765 Secs (765 Secs)	
								[==>]	***[2]***

Orbit Structure

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GS Reacq
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Pointing Maneuver
Pointing Maneuver
Exp. 13 (Auto-WAVECAL)
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Exp. 9
Exp. 11
Exp. 13
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 10
Exp. 12
Exp. 14
Overhead
Overhead
Overhead

Visit

Proposal 14759, Visit 02 Fri Jul 29 19:17:44 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, STIS/NUV-MAMA, STIS/CCD

Special Requirements: ORIENT 2.8D TO 2.8 D; ORIENT 182.8D TO 182.8 D

Comments: Brightest star in F275W within 40 arcsec radius of the slit center in the NUV images is at RA = 13:26:50.4875, Dec = -47:30:15.640. It has m275=14.1 vegamag. Although this star should not fall within the slit, if it did, it would be safe to observe in NUV/G230L.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	NGC5139-PAIR2	RA: 13 26 48.4411 (201.7018379d) Dec: -47 30 35.02 (-47.50973d) Equinox: J2000		V=18.0+/-0.2 m275 = 16.3 vegamag	Reference Frame: ICRS

Comments: The coordinates above fall midway between the pair of stars.
Coordinates come from HLA image, but shifted to agree with position of acquisition star in HSC, 2MASS, and GSC, which all agree to within a few WFC3/UVIS pixels in the HLA image.
In the native HLA image (WFC3/F275W or WFC3/F814W), the position would be 13 26 48.6637 -47 30 35.68. This can be used to see the slit placement in Aladin.

The photometric information above is for the fainter of the two stars in the slit (specifically, the northwestern star in the pair), as determined in the F275W HLA image of the cluster.

The other star in the pair has the following photometry:
V=16.6
m275 = 15.4 vegamag

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	NGC5139-ACQ	RA: 13 26 45.3280 (201.6888667d) Dec: -47 29 16.87 (-47.48802d) Equinox: J2000		V=13.3+/-0.5	Reference Frame: ICRS

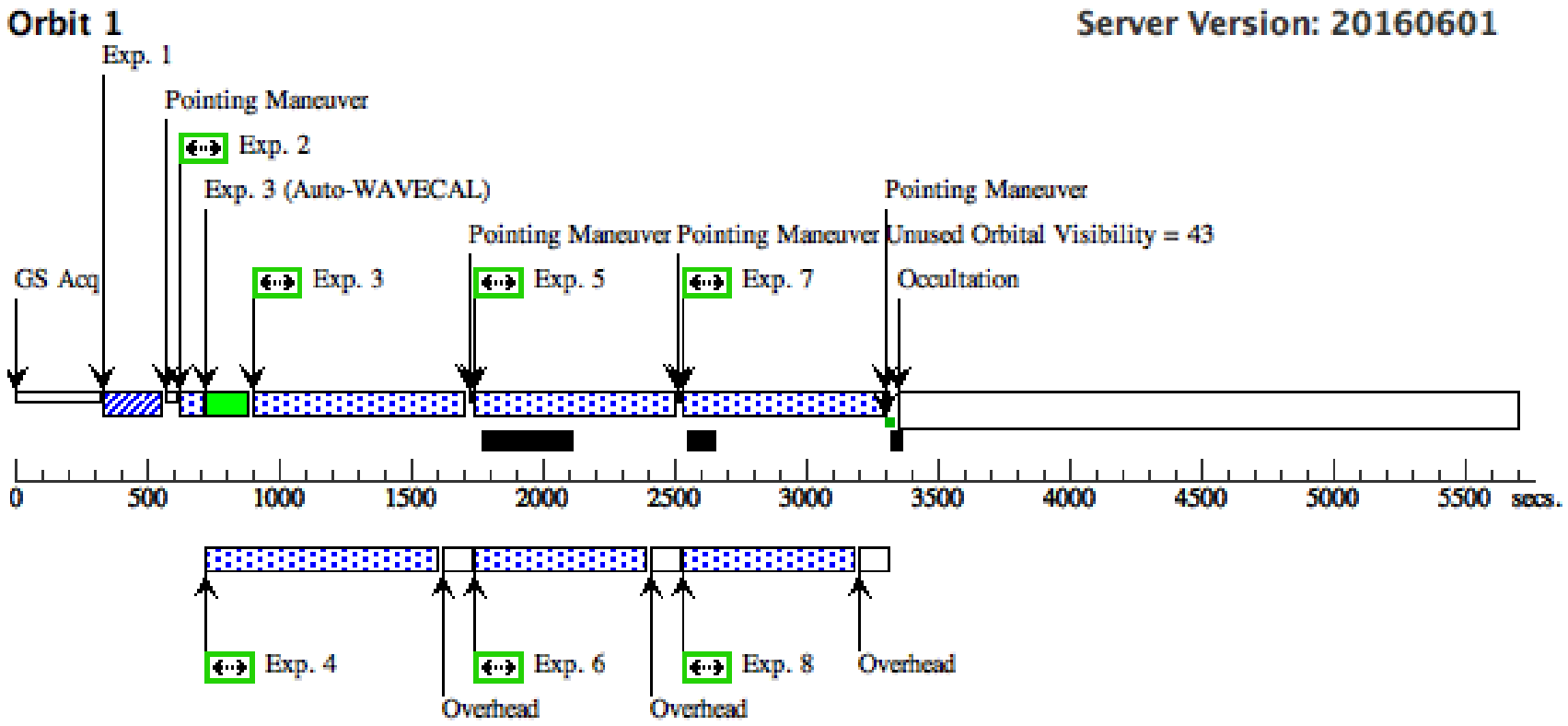
Comments: V-magnitude comes from inspection of HLA WFPC2/F555W image. Aperture photometry on this image implies V=13.05 mag. HSC says m555=13.55 mag. Anywhere in this range will be fine for acquisition, regardless of spectral type (M to O), providing SNR>40 and well below saturation.

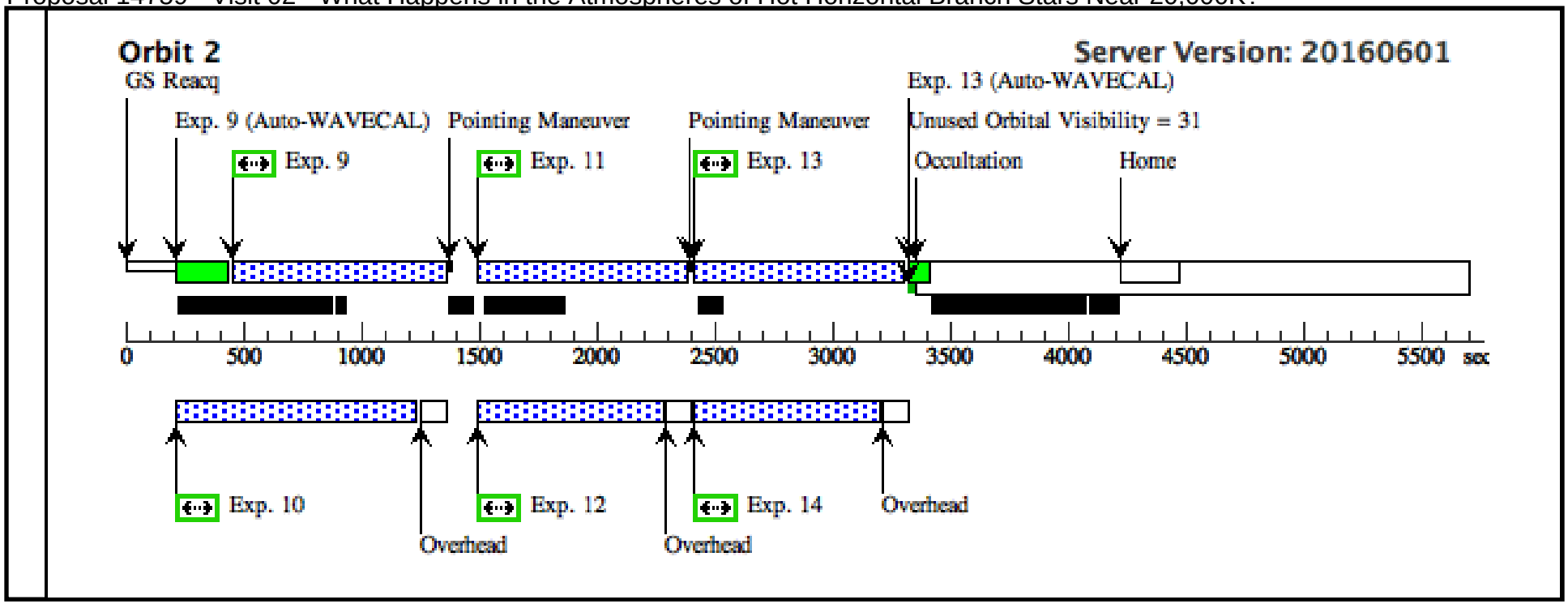
Coordinates come from HLA image, but shifted to agree with position of acquisition star in HSC, 2MASS, and GSC, which all agree to within a few WFC3/UVIS pixels in the HLA image.
In the native HLA image (WFC3/F275W or WFC3/F814W), the position would be 13 26 45.5506 -47 29 17.53. This can be used to see the ACQ placement in Aladin.
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) NGC5139-ACQ	STIS/CCD, ACQ, F28X50LP	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***
2		(2) NGC5139-PAIR 2	STIS/CCD, ACCUM, 52X0.5	MIRROR	CR-SPLIT=NO; GAIN=4	POS TARG null,0		2 Secs (2 Secs)	
								[==>]	***[1]***
Comments: Image through the slit to help characterize position of sources relative to slit midline.									
3	(STIS.sp.820077)	(2) NGC5139-PAIR 2	STIS/CCD, ACCUM, 52X0.5	G430L 4300 A	CR-SPLIT=NO	POS TARG null,0	Prime + Parallel Group 3-4 in Visit 02	720 Secs (720 Secs)	
								[==>]	***[1]***
4		ANY	WFC3/UVIS, ACCUM, UVIS	F275W	FLASH=12		Prime + Parallel Group 3-4 in Visit 02	850 Secs (850 Secs)	
								[==>]	***[1]***
5	(STIS.sp.820077)	(2) NGC5139-PAIR 2	STIS/CCD, ACCUM, 52X0.5	G430L 4300 A	CR-SPLIT=NO	POS TARG null,0.2	Prime + Parallel Group 5-6 in Visit 02	720 Secs (720 Secs)	
								[==>]	***[1]***
6		ANY	WFC3/UVIS, ACCUM, UVIS	F336W	FLASH=12		Prime + Parallel Group 5-6 in Visit 02	630 Secs (630 Secs)	
								[==>]	***[1]***
7	(STIS.sp.820077)	(2) NGC5139-PAIR 2	STIS/CCD, ACCUM, 52X0.5	G430L 4300 A	CR-SPLIT=NO	POS TARG null,-0.2	Prime + Parallel Group 7-8 in Visit 02	720 Secs (720 Secs)	
								[==>]	***[1]***
8		ANY	WFC3/UVIS, ACCUM, UVIS	F438W	FLASH=7		Prime + Parallel Group 7-8 in Visit 02	630 Secs (630 Secs)	
								[==>]	***[1]***
9	(STIS.sp.820077)	(2) NGC5139-PAIR 2	STIS/NUV-MAMA, ACCUM, 52X0.5	G230L 2376 A		POS TARG null,0	Prime + Parallel Group 9-10 in Visit 02	877 Secs (877 Secs)	
								[==>]	***[2]***
10		ANY	WFC3/UVIS, ACCUM, UVIS	F438W	FLASH=4		Prime + Parallel Group 9-10 in Visit 02	1025 Secs (1025 Secs)	
								[==>]	***[2]***
11	(STIS.sp.820077)	(2) NGC5139-PAIR 2	STIS/NUV-MAMA, ACCUM, 52X0.5	G230L 2376 A		POS TARG null,0.2	Prime + Parallel Group 11-12 in Visit 02	877 Secs (877 Secs)	
								[==>]	***[2]***
12		ANY	WFC3/UVIS, ACCUM, UVIS	F275W	FLASH=12		Prime + Parallel Group 11-12 in Visit 02	765 Secs (765 Secs)	
								[==>]	***[2]***
13	(STIS.sp.820077)	(2) NGC5139-PAIR 2	STIS/NUV-MAMA, ACCUM, 52X0.5	G230L 2376 A		POS TARG null,-0.2	Prime + Parallel Group 13-14 in Visit 02	877 Secs (877 Secs)	
								[==>]	***[2]***
14		ANY	WFC3/UVIS, ACCUM, UVIS	F336W	FLASH=12		Prime + Parallel Group 13-14 in Visit 02	765 Secs (765 Secs)	
								[==>]	***[2]***

Orbit Structure

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GS Reacq
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Pointing Maneuver
Pointing Maneuver
Exp. 13 (Auto-WAVECAL)
Unused Orbital Visibility = 31
Exp. 9
Exp. 11
Exp. 13
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 10
Exp. 12
Exp. 14
Overhead
Overhead
Overhead

Visit

Proposal 14759, Visit 03 Fri Jul 29 19:17:45 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, STIS/NUV-MAMA, STIS/CCD

Special Requirements: ORIENT 80.5D TO 80.5 D; ORIENT 260.5D TO 260.5 D

Comments: Brightest star in F275W within 40 arcsec radius of the slit center in the NUV images is at RA = 13:26:48.5958, Dec = -47:28:59.782. It has m275=14.8 vegamag. Although this star should not fall within the slit, if it did, it would be safe to observe in NUV/G230L.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	NGC5139-PAIR3	RA: 13 26 47.4861 (201.6978587d) Dec: -47 29 6.61 (-47.48517d) Equinox: J2000		V=17.3+/-0.2 m275=15.7 vegamag	Reference Frame: ICRS

Comments: The coordinates above fall midway between the pair of stars.
Coordinates come from HLA image, but shifted to agree with position of acquisition star in HSC, 2MASS, and GSC, which all agree to within a few WFC3/UVIS pixels in the HLA image.
In the native HLA image (WFC3/F275W or WFC3/F814W), the position would be 13 26 47.7087 -47 29 07.27. This can be used to see the slit placement in Aladin.

The photometric information above is for the fainter of the two stars in the slit (specifically, the northeastern star in the pair), as determined in the F275W HLA image of the cluster.

The other star in the pair has the following photometry:
V=16.8
m275 = 15.6 vegamag

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	NGC5139-ACQ	RA: 13 26 45.3280 (201.6888667d) Dec: -47 29 16.87 (-47.48802d) Equinox: J2000		V=13.3+/-0.5	Reference Frame: ICRS

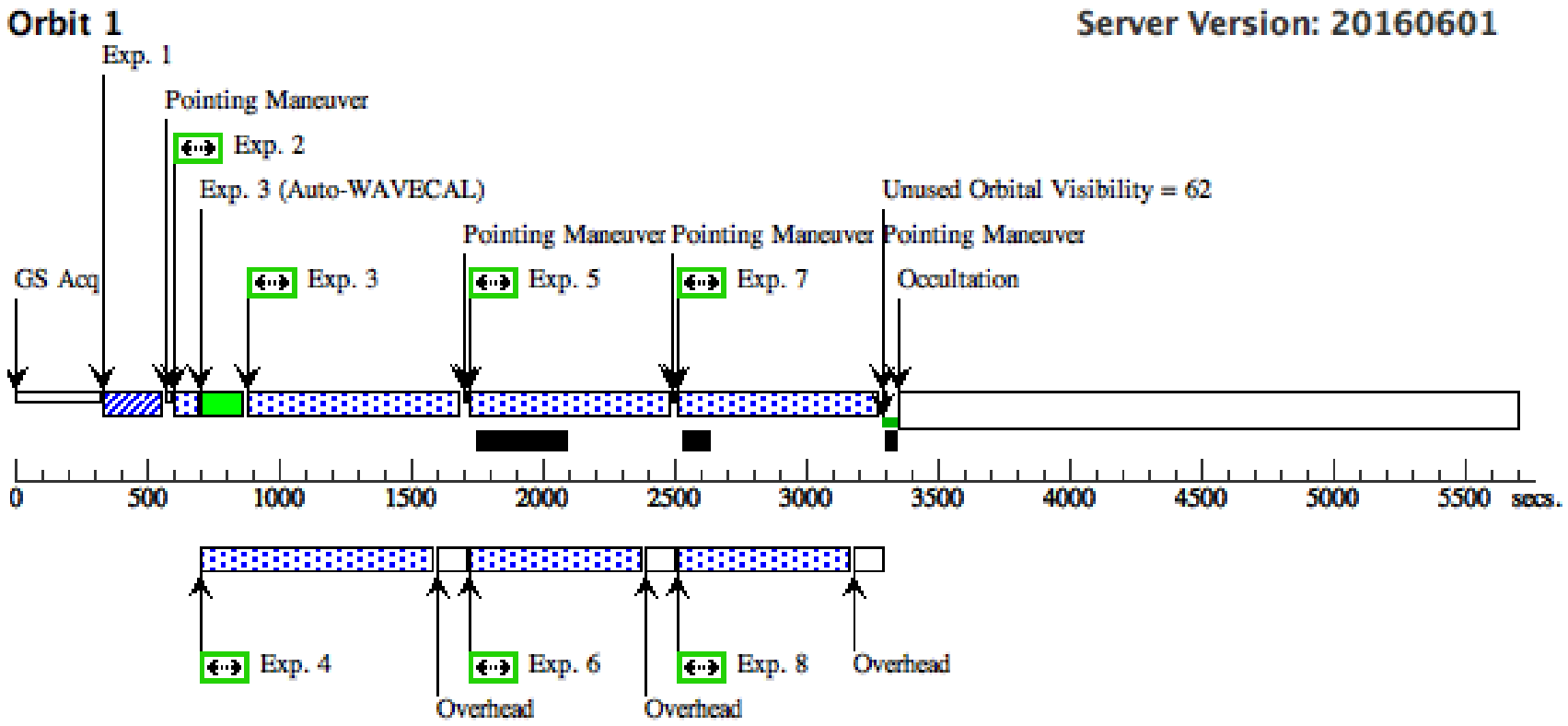
Comments: V-magnitude comes from inspection of HLA WFPC2/F555W image. Aperture photometry on this image implies V=13.05 mag. HSC says m555=13.55 mag. Anywhere in this range will be fine for acquisition, regardless of spectral type (M to O), providing SNR>40 and well below saturation.

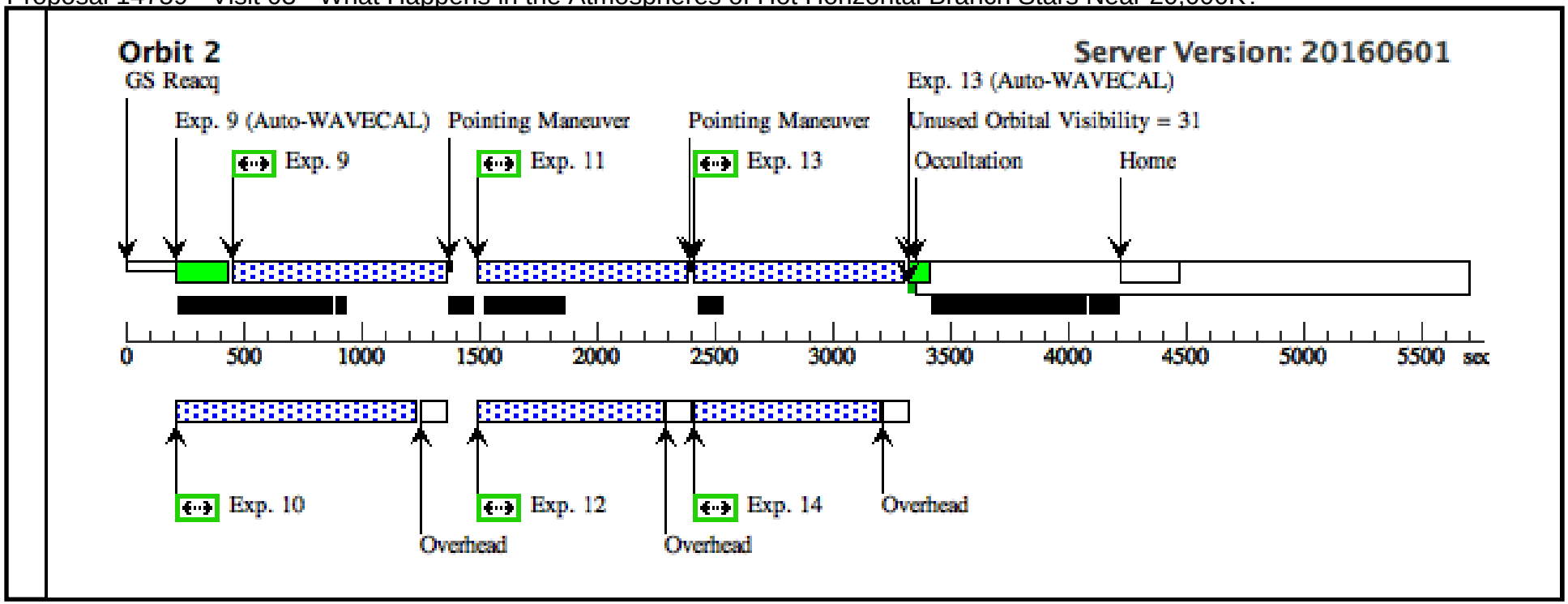
Coordinates come from HLA image, but shifted to agree with position of acquisition star in HSC, 2MASS, and GSC, which all agree to within a few WFC3/UVIS pixels in the HLA image.
In the native HLA image (WFC3/F275W or WFC3/F814W), the position would be 13 26 45.5506 -47 29 17.53. This can be used to see the ACQ placement in Aladin.
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) NGC5139-ACQ	STIS/CCD, ACQ, F28X50LP	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***
2		(3) NGC5139-PAIR 3	STIS/CCD, ACCUM, 52X0.5	MIRROR	CR-SPLIT=NO; GAIN=4	POS TARG null,0		2 Secs (2 Secs)	
								[==>]	***[1]***
Comments: Image through the slit to help characterize position of sources relative to slit midline.									
3	(STIS.sp.820077)	(3) NGC5139-PAIR 3	STIS/CCD, ACCUM, 52X0.5	G430L 4300 A	CR-SPLIT=NO	POS TARG null,0	Prime + Parallel Group 3-4 in Visit 03	720 Secs (720 Secs)	
								[==>]	***[1]***
4		ANY	WFC3/UVIS, ACCUM, UVIS	F275W	FLASH=12		Prime + Parallel Group 3-4 in Visit 03	850 Secs (850 Secs)	
								[==>]	***[1]***
5	(STIS.sp.820077)	(3) NGC5139-PAIR 3	STIS/CCD, ACCUM, 52X0.5	G430L 4300 A	CR-SPLIT=NO	POS TARG null,0.2	Prime + Parallel Group 5-6 in Visit 03	720 Secs (720 Secs)	
								[==>]	***[1]***
6		ANY	WFC3/UVIS, ACCUM, UVIS	F336W	FLASH=12		Prime + Parallel Group 5-6 in Visit 03	630 Secs (630 Secs)	
								[==>]	***[1]***
7	(STIS.sp.820077)	(3) NGC5139-PAIR 3	STIS/CCD, ACCUM, 52X0.5	G430L 4300 A	CR-SPLIT=NO	POS TARG null,-0.2	Prime + Parallel Group 7-8 in Visit 03	720 Secs (720 Secs)	
								[==>]	***[1]***
8		ANY	WFC3/UVIS, ACCUM, UVIS	F438W	FLASH=7		Prime + Parallel Group 7-8 in Visit 03	630 Secs (630 Secs)	
								[==>]	***[1]***
9	(STIS.sp.820077)	(3) NGC5139-PAIR 3	STIS/NUV-MAMA, ACCUM, 52X0.5	G230L 2376 A		POS TARG null,0	Prime + Parallel Group 9-10 in Visit 03	877 Secs (877 Secs)	
								[==>]	***[2]***
10		ANY	WFC3/UVIS, ACCUM, UVIS	F438W	FLASH=4		Prime + Parallel Group 9-10 in Visit 03	1025 Secs (1025 Secs)	
								[==>]	***[2]***
11	(STIS.sp.820077)	(3) NGC5139-PAIR 3	STIS/NUV-MAMA, ACCUM, 52X0.5	G230L 2376 A		POS TARG null,0.2	Prime + Parallel Group 11-12 in Visit 03	877 Secs (877 Secs)	
								[==>]	***[2]***
12		ANY	WFC3/UVIS, ACCUM, UVIS	F275W	FLASH=12		Prime + Parallel Group 11-12 in Visit 03	765 Secs (765 Secs)	
								[==>]	***[2]***
13	(STIS.sp.820077)	(3) NGC5139-PAIR 3	STIS/NUV-MAMA, ACCUM, 52X0.5	G230L 2376 A		POS TARG null,-0.2	Prime + Parallel Group 13-14 in Visit 03	877 Secs (877 Secs)	
								[==>]	***[2]***
14		ANY	WFC3/UVIS, ACCUM, UVIS	F336W	FLASH=12		Prime + Parallel Group 13-14 in Visit 03	765 Secs (765 Secs)	
								[==>]	***[2]***

Orbit Structure




Orbit 2
Server Version: 20160601
GS Reacq
Exp. 9 (Auto-WAVECAL)
Pointing Maneuver
Pointing Maneuver
Exp. 13 (Auto-WAVECAL)
Unused Orbital Visibility = 31
Exp. 9
Exp. 11
Exp. 13
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 10
Exp. 12
Exp. 14
Overhead
Overhead
Overhead