17527 - Weighing the Most Massive Binary

Cycle: 31, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
Dr. Philip Louis Massey (PI) (Contact)	**Lowell Observatory**
Dr. Laura Penny (CoI)	College of Charleston
Dr. Nidia Morrell (CoI)	Carnegie Institution of Washington
Dr. Kathryn Neugent (CoI)	
Ms. Sarah Bodansky (CoI)	University of Massachusetts - Amherst

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) NGC3603-A1-OFFSET (2) NGC3603-A1	STIS/CCD	1	26-Nov-2024 18:00:17.0	yes
02	(1) NGC3603-A1-OFFSET (2) NGC3603-A1	STIS/CCD	1	26-Nov-2024 18:00:18.0	yes
03	(1) NGC3603-A1-OFFSET (2) NGC3603-A1	STIS/CCD	1	26-Nov-2024 18:00:19.0	yes
04	(1) NGC3603-A1-OFFSET (2) NGC3603-A1	STIS/CCD	1	26-Nov-2024 18:00:20.0	yes
05	(1) NGC3603-A1-OFFSET (2) NGC3603-A1	STIS/CCD	1	26-Nov-2024 18:00:22.0	yes
06	(1) NGC3603-A1-OFFSET (2) NGC3603-A1	STIS/CCD	1	26-Nov-2024 18:00:23.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
07	(1) NGC3603-A1-OFFSET (2) NGC3603-A1	STIS/CCD	1	26-Nov-2024 18:00:25.0	yes

7 Total Orbits Used

ABSTRACT

Understanding massive star evolution requires understanding massive binaries, as many massive stars are members of binary systems. In addition, orbit solutions provide the one direct measurement of a star's most fundamental property, its mass. We are proposing to measure accurate masses for NGC3603-A1, the most massive binary known, and the most luminous star in its rich cluster. Although identified as an eclipsing binary in 1984, the extreme crowding in the center of the cluster has made follow-up work difficult. An orbit using AO in the NIR on the VLT found masses of 116 Mo and 89 Mo for the two components. If correct, the primary would have a mass 50% larger than that of any other directly measured unevolved star. However, the uncertainties on these masses are quite large as the spectral features are mainly very broad, blended emission lines. An attempt to get better velocities was carried out by a competing group in Cycle 19, but the data were never published. We have analyzed these spectra, discovering that the upper Balmer lines are in absorption, and that at orbital phases near quadrature, the lines are readily resolved into two components: one from the primary and one from the secondary. Only two of their observations were taken at such phases, and the data have poor S/N. Here we propose to obtain much better data on the upper Balmer lines taken at times where we know the two components will be well resolved. This provides an efficient way to obtain accurate orbital parameters and masses for the most massive binary known. Such a system is the unevolved progenitor of the sort of merging massive black hole pairs indicated by recent gravitational wave detections.

OBSERVING DESCRIPTION

The goal of this program is to obtain high S/N (~100) sspectrum of the star NGC 3601-A1, two at phase ~0.25, and two at a phase of 0.75. The star is crowded, and so the observing plan is to do the ACQ on a nearby (20" sepaeration) offset star.
A SAM then takes us to A1, where we perform a peakup with the 52x0.1E1 aperture. We then do a 7-point dither-along-slit centered on the 52x0.1E1.

Special requirements include the timing given the 3.8 day orbital period of the binary, and the need to have ORIENT angles that avoid nearby bright stars from contaminating our spectrum.

Visit

Proposal 17527, Visit1Phase25A (01), completed Tue Nov 26 23:00:25 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 61D TO 103 D; ORIENT 176D TO 182 D; ORIENT 249D TO 292 D; ORIENT 346D TO 11 D; Period 3.77298 D AND ZERO-PHASE HJD2456161.3650

Diagnostics

(Visit1Phase25A (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=7	Angle Between Sides=		
	Point Spacing=0.50	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC3603-A1-OFFSET	RA: 11 15 7.6261 (168.7817754d)		V=12.23+/-0.03	Reference Frame: ICRS
		Dec: -61 15 17.56 (-61.25488d)		B-V=1.42	
		Equinox: J2000			

Comments: Proper motion has been applied to bring the coordinates to circa Cycle 31 from Gaia 2016 epoch.
Category=STAR
Description=[B0-B2 III-I]
Extended=NO

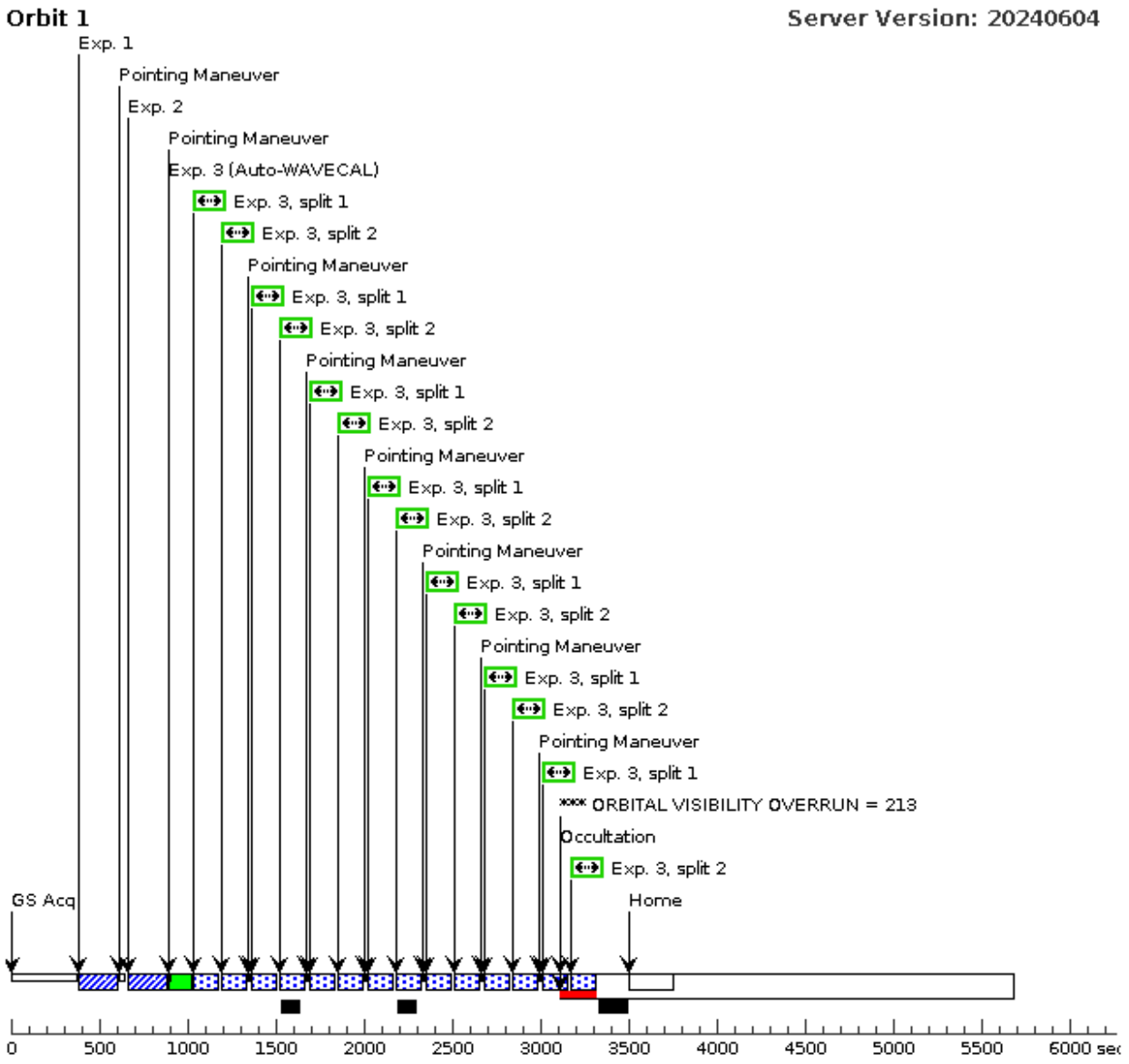
(2)	NGC3603-A1	RA: 11 15 7.2765 (168.7803187d)		V=11.18+/-0.03	Reference Frame: ICRS
		Dec: -61 15 38.39 (-61.26066d)		B-V=1.03	
		Equinox: J2000			

Comments: Positions have been measured on numerous HST/STIS images as the Gaia position is affected by crowded. Similarly the Gaia proper motion cannot be trusted. Instead, the average cluster proper motion has been adopted and applied to the Cycle 31 time frame. V-band magnitude measured from ACS/HRC frame J9EU05040 taken at phase 0.25, i.e., out of eclipse, and thus a good representation of the brightness for our observations here.
Category=STAR
Description=[EMISSION LINE STAR, SUPERGIANT O, WOLF RAYET - WN]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1889175)	(1) NGC3603-A1-OFFSET	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT	PHASE 0.20 TO 0.30		0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	(1889176)	(2) NGC3603-A1	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
3	(STIS.sp.1889174)	(2) NGC3603-A1	STIS/CCD, ACCUM, 52X0.1E1	G430M 3843 A	CR-SPLIT=2		Pattern 1, Exps 3-3 in Visit1Phase25A (01) (1)	165 Secs (1505 Secs)	
								[==>107.5 Secs (Pattern 1, Split 1)]	***[1]***
								[==>107.5 Secs (Pattern 1, Split 2)]	
								[==>107.5 Secs (Pattern 2, Split 1)]	
								[==>107.5 Secs (Pattern 2, Split 2)]	
								[==>107.5 Secs (Pattern 3, Split 1)]	
								[==>107.5 Secs (Pattern 3, Split 2)]	
								[==>107.5 Secs (Pattern 4, Split 1)]	
								[==>107.5 Secs (Pattern 4, Split 2)]	
								[==>107.5 Secs (Pattern 5, Split 1)]	
								[==>107.5 Secs (Pattern 5, Split 2)]	
								[==>107.5 Secs (Pattern 6, Split 1)]	
								[==>107.5 Secs (Pattern 6, Split 2)]	
								[==>107.5 Secs (Pattern 7, Split 1)]	
								[==>107.5 Secs (Pattern 7, Split 2)]	

Orbit Structure



Visit

Proposal 17527, Visit2Phase25B (02), failed Tue Nov 26 23:00:26 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 61D TO 103 D; ORIENT 176D TO 182 D; ORIENT 249D TO 292 D; ORIENT 346D TO 11 D; AFTER 01 BY 3 D TO 500 D; Period 3.77298 D AND ZERO-PHASE HJD2456161.3650

Diagnostics

(Visit2Phase25B (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=7	Angle Between Sides=		
	Point Spacing=0.50	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC3603-A1-OFFSET	RA: 11 15 7.6261 (168.7817754d)		V=12.23+/-0.03	Reference Frame: ICRS
		Dec: -61 15 17.56 (-61.25488d)		B-V=1.42	
		Equinox: J2000			

Comments: Proper motion has been applied to bring the coordinates to circa Cycle 31 from Gaia 2016 epoch.
Category=STAR
Description=[B0-B2 III-I]
Extended=NO

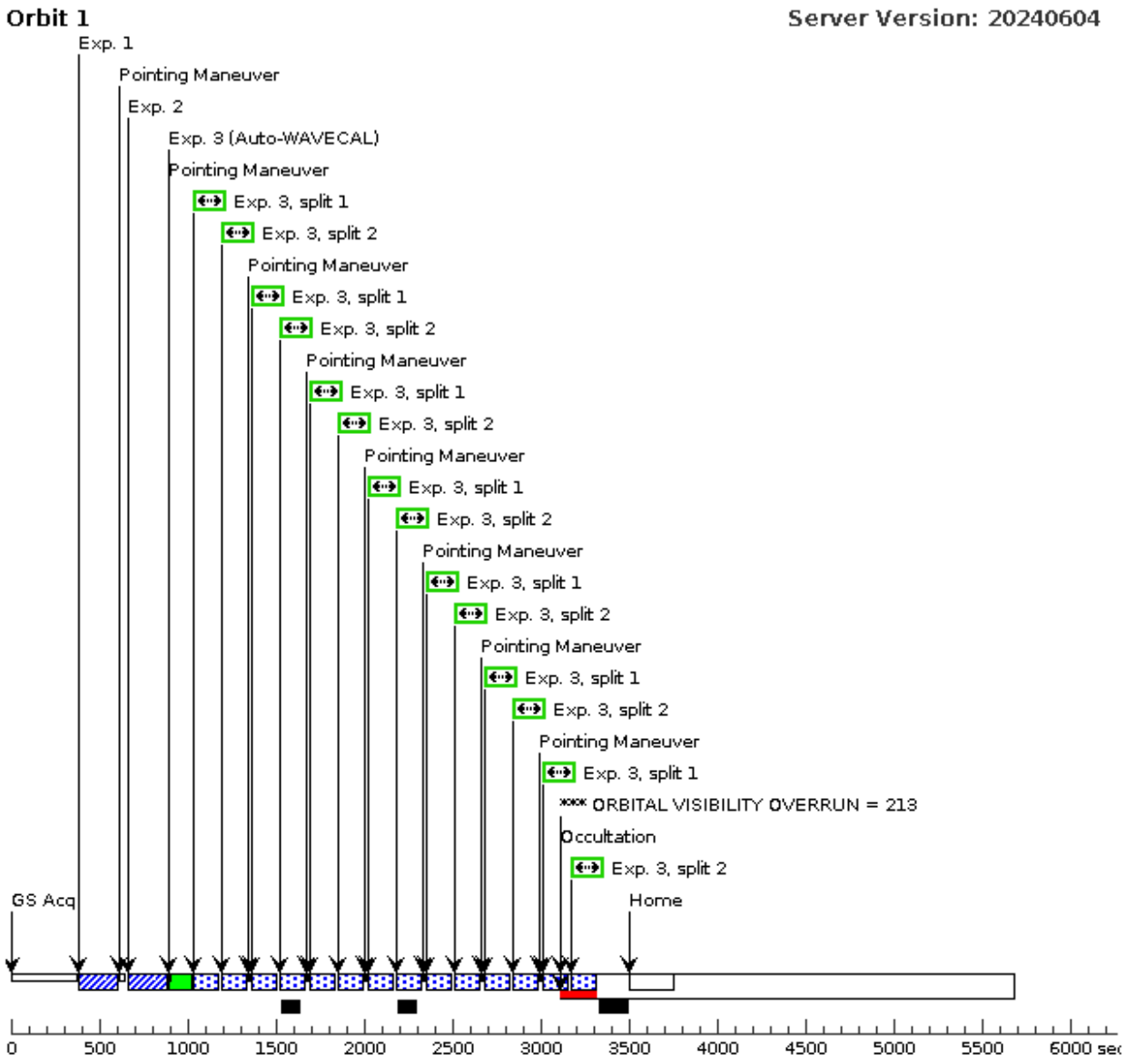
(2)	NGC3603-A1	RA: 11 15 7.2765 (168.7803187d)		V=11.18+/-0.03	Reference Frame: ICRS
		Dec: -61 15 38.39 (-61.26066d)		B-V=1.03	
		Equinox: J2000			

Comments: Positions have been measured on numerous HST/STIS images as the Gaia position is affected by crowded. Similarly the Gaia proper motion cannot be trusted. Instead, the average cluster proper motion has been adopted and applied to the Cycle 31 time frame. V-band magnitude measured from ACS/HRC frame J9EU05040 taken at phase 0.25, i.e., out of eclipse, and thus a good representation of the brightness for our observations here.
Category=STAR
Description=[EMISSION LINE STAR, SUPERGIANT O, WOLF RAYET - WN]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1889175)	(1) NGC3603-A1-OFFSET	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT	PHASE 0.20 TO 0.30		0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	(1889176)	(2) NGC3603-A1	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
3	(STIS.sp.1889174)	(2) NGC3603-A1	STIS/CCD, ACCUM, 52X0.1E1	G430M 3843 A	CR-SPLIT=2		Pattern 1, Exps 3-3 in Visit2Phase25B (02) (1)	165 Secs (1505 Secs)	
								[==>107.5 Secs (Pattern 1, Split 1)]	***[1]***
								[==>107.5 Secs (Pattern 1, Split 2)]	
								[==>107.5 Secs (Pattern 2, Split 1)]	
								[==>107.5 Secs (Pattern 2, Split 2)]	
								[==>107.5 Secs (Pattern 3, Split 1)]	
								[==>107.5 Secs (Pattern 3, Split 2)]	
								[==>107.5 Secs (Pattern 4, Split 1)]	
								[==>107.5 Secs (Pattern 4, Split 2)]	
								[==>107.5 Secs (Pattern 5, Split 1)]	
								[==>107.5 Secs (Pattern 5, Split 2)]	
								[==>107.5 Secs (Pattern 6, Split 1)]	
								[==>107.5 Secs (Pattern 6, Split 2)]	
								[==>107.5 Secs (Pattern 7, Split 1)]	
								[==>107.5 Secs (Pattern 7, Split 2)]	

Orbit Structure



Visit

Proposal 17527, Visit3Phase75A (03), completed Tue Nov 26 23:00:26 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 61D TO 103 D; ORIENT 176D TO 182 D; ORIENT 249D TO 292 D; ORIENT 346D TO 11 D; Period 3.77298 D AND ZERO-PHASE HJD2456161.3650

Diagnostics

(Visit3Phase75A (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=7	Angle Between Sides=		
	Point Spacing=0.50	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC3603-A1-OFFSET	RA: 11 15 7.6261 (168.7817754d)		V=12.23+/-0.03	Reference Frame: ICRS
		Dec: -61 15 17.56 (-61.25488d)		B-V=1.42	
		Equinox: J2000			

Comments: Proper motion has been applied to bring the coordinates to circa Cycle 31 from Gaia 2016 epoch.
Category=STAR
Description=[B0-B2 III-I]
Extended=NO

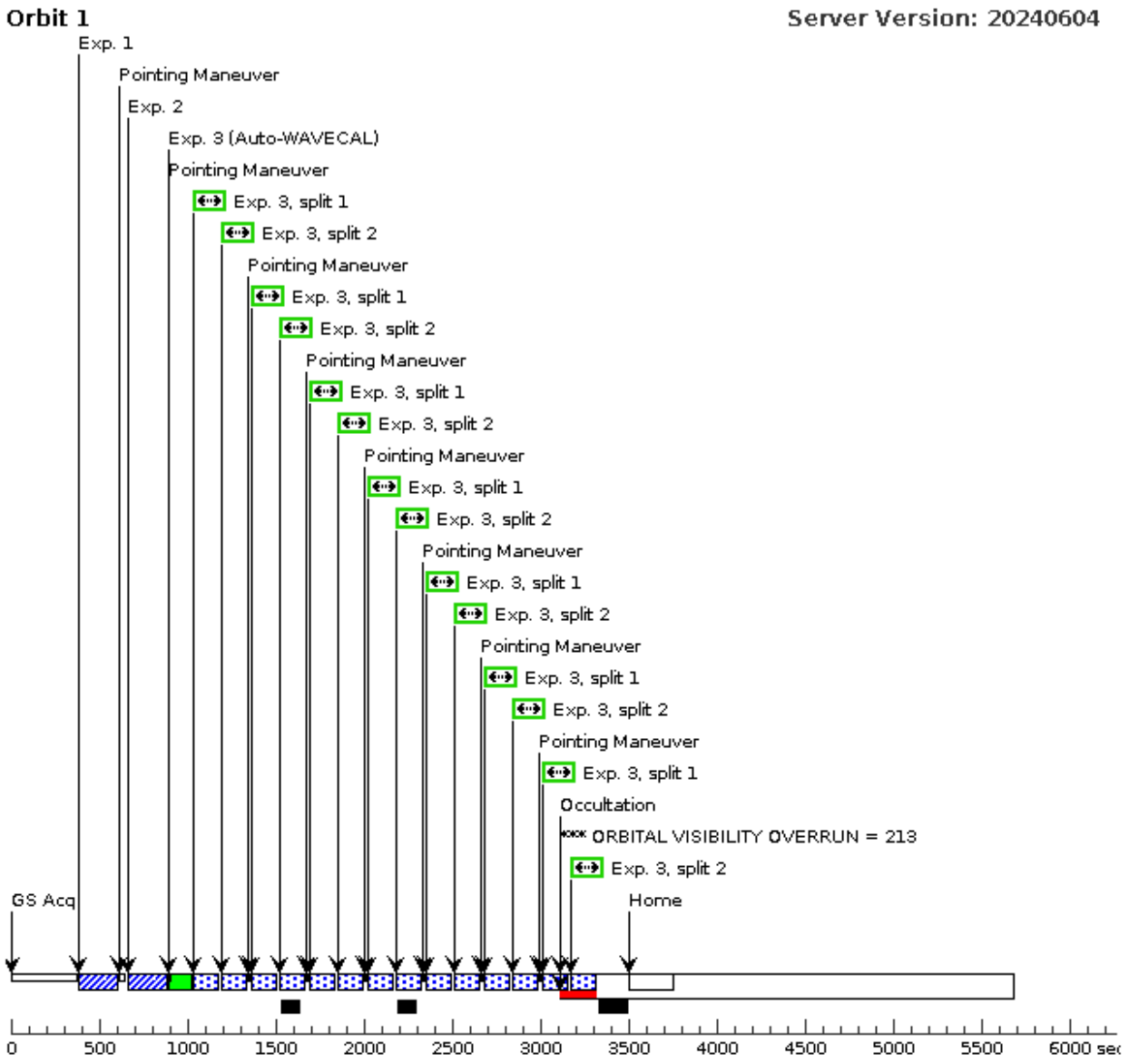
(2)	NGC3603-A1	RA: 11 15 7.2765 (168.7803187d)		V=11.18+/-0.03	Reference Frame: ICRS
		Dec: -61 15 38.39 (-61.26066d)		B-V=1.03	
		Equinox: J2000			

Comments: Positions have been measured on numerous HST/STIS images as the Gaia position is affected by crowded. Similarly the Gaia proper motion cannot be trusted. Instead, the average cluster proper motion has been adopted and applied to the Cycle 31 time frame. V-band magnitude measured from ACS/HRC frame J9EU05040 taken at phase 0.25, i.e., out of eclipse, and thus a good representation of the brightness for our observations here.
Category=STAR
Description=[EMISSION LINE STAR, SUPERGIANT O, WOLF RAYET - WN]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1889175)	(1) NGC3603-A1-OFFSET	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT	PHASE 0.70 TO 0.80		0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	(1889176)	(2) NGC3603-A1	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
3	(STIS.sp.1889174)	(2) NGC3603-A1	STIS/CCD, ACCUM, 52X0.1E1	G430M 3843 A	CR-SPLIT=2		Pattern 1, Exps 3-3 in Visit3Phase75A (03) (1)	165 Secs (1505 Secs)	
								[==>107.5 Secs (Pattern 1, Split 1)]	***[1]***
								[==>107.5 Secs (Pattern 1, Split 2)]	
								[==>107.5 Secs (Pattern 2, Split 1)]	
								[==>107.5 Secs (Pattern 2, Split 2)]	
								[==>107.5 Secs (Pattern 3, Split 1)]	
								[==>107.5 Secs (Pattern 3, Split 2)]	
								[==>107.5 Secs (Pattern 4, Split 1)]	
								[==>107.5 Secs (Pattern 4, Split 2)]	
								[==>107.5 Secs (Pattern 5, Split 1)]	
								[==>107.5 Secs (Pattern 5, Split 2)]	
								[==>107.5 Secs (Pattern 6, Split 1)]	
								[==>107.5 Secs (Pattern 6, Split 2)]	
								[==>107.5 Secs (Pattern 7, Split 1)]	
								[==>107.5 Secs (Pattern 7, Split 2)]	

Orbit Structure



Visit

Proposal 17527, Visit4Phase75B (04), failed Tue Nov 26 23:00:26 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 61D TO 103 D; ORIENT 176D TO 182 D; ORIENT 249D TO 292 D; ORIENT 346D TO 11 D; AFTER 03 BY 3 D TO 500 D; Period 3.77298 D AND ZERO-PHASE HJD2456161.3650

Diagnostics

(Visit4Phase75B (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=7	Angle Between Sides=		
	Point Spacing=0.50	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC3603-A1-OFFSET	RA: 11 15 7.6261 (168.7817754d)		V=12.23+/-0.03	Reference Frame: ICRS
		Dec: -61 15 17.56 (-61.25488d)		B-V=1.42	
		Equinox: J2000			

Comments: Proper motion has been applied to bring the coordinates to circa Cycle 31 from Gaia 2016 epoch.
Category=STAR
Description=[B0-B2 III-I]
Extended=NO

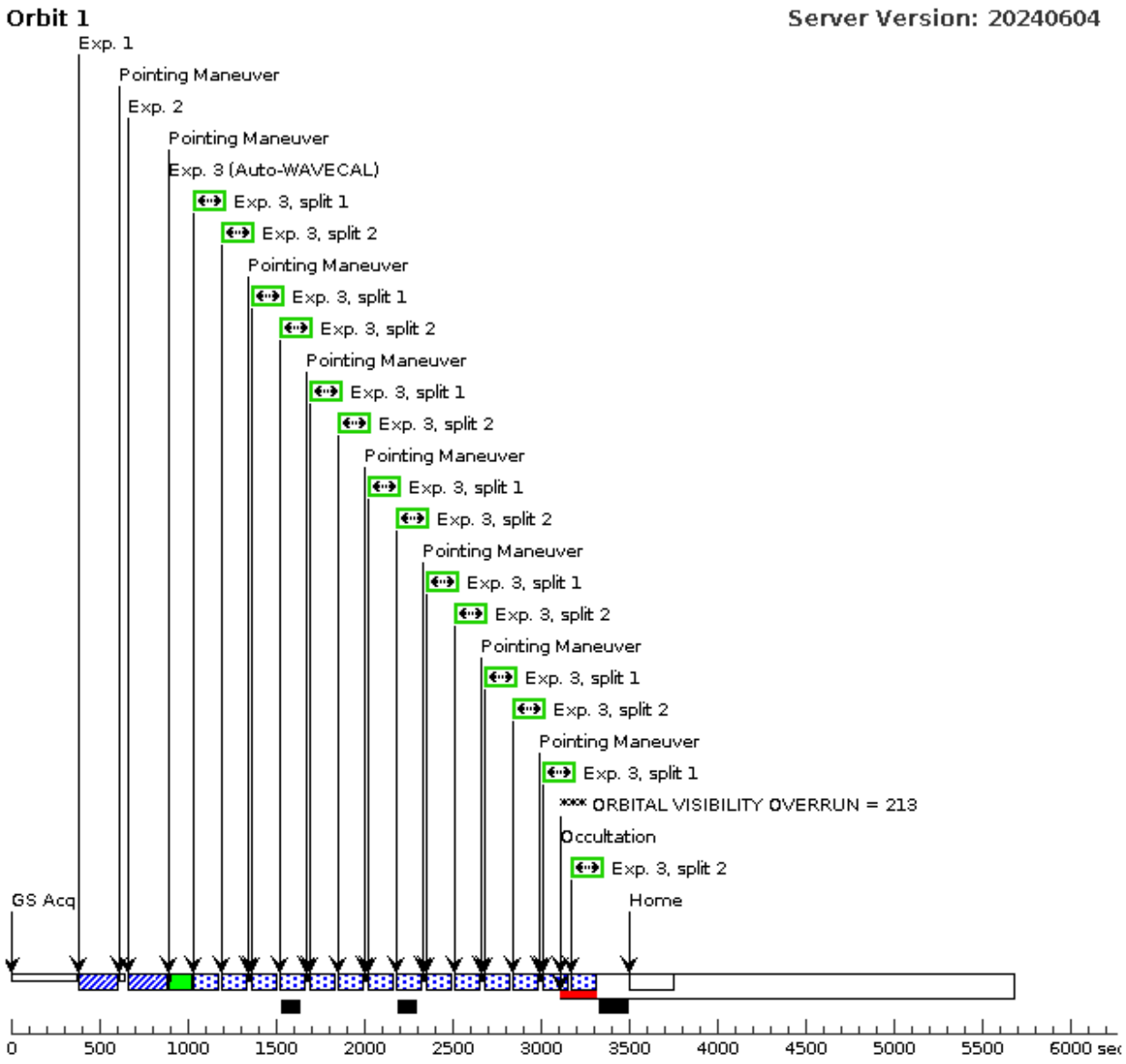
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	NGC3603-A1	RA: 11 15 7.2765 (168.7803187d)		V=11.18+/-0.03	Reference Frame: ICRS
		Dec: -61 15 38.39 (-61.26066d)		B-V=1.03	
		Equinox: J2000			

Comments: Positions have been measured on numerous HST/STIS images as the Gaia position is affected by crowded. Similarly the Gaia proper motion cannot be trusted. Instead, the average cluster proper motion has been adopted and applied to the Cycle 31 time frame. V-band magnitude measured from ACS/HRC frame J9EU05040 taken at phase 0.25, i.e., out of eclipse, and thus a good representation of the brightness for our observations here.
Category=STAR
Description=[EMISSION LINE STAR, SUPERGIANT O, WOLF RAYET - WN]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1889175)	(1) NGC3603-A1-OFFSET	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT	PHASE 0.70 TO 0.80		0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	(1889176)	(2) NGC3603-A1	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
3	(STIS.sp.1889174)	(2) NGC3603-A1	STIS/CCD, ACCUM, 52X0.1E1	G430M 3843 A	CR-SPLIT=2		Pattern 1, Exps 3-3 in Visit4Phase75B (04) (1)	165 Secs (1505 Secs)	
								[==>107.5 Secs (Pattern 1, Split 1)]	***[1]***
								[==>107.5 Secs (Pattern 1, Split 2)]	
								[==>107.5 Secs (Pattern 2, Split 1)]	
								[==>107.5 Secs (Pattern 2, Split 2)]	
								[==>107.5 Secs (Pattern 3, Split 1)]	
								[==>107.5 Secs (Pattern 3, Split 2)]	
								[==>107.5 Secs (Pattern 4, Split 1)]	
								[==>107.5 Secs (Pattern 4, Split 2)]	
								[==>107.5 Secs (Pattern 5, Split 1)]	
								[==>107.5 Secs (Pattern 5, Split 2)]	
								[==>107.5 Secs (Pattern 6, Split 1)]	
								[==>107.5 Secs (Pattern 6, Split 2)]	
								[==>107.5 Secs (Pattern 7, Split 1)]	
								[==>107.5 Secs (Pattern 7, Split 2)]	

Orbit Structure



Visit

Proposal 17527, Visit2Try2Phase25B (05), completed Tue Nov 26 23:00:26 GMT 2024

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 61D TO 103 D; ORIENT 176D TO 182 D; ORIENT 249D TO 292 D; ORIENT 346D TO 11 D; AFTER 01 BY 3 D TO 500 D; Period 3.77298 D AND ZERO-PHASE HJD2456161.3650

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=7	Angle Between Sides=		
	Point Spacing=0.50	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC3603-A1-OFFSET	RA: 11 15 7.6261 (168.7817754d)		V=12.23+/-0.03	Reference Frame: ICRS
		Dec: -61 15 17.56 (-61.25488d)		B-V=1.42	
		Equinox: J2000			

Comments: Proper motion has been applied to bring the coordinates to circa Cycle 31 from Gaia 2016 epoch.
Category=STAR
Description=[B0-B2 III-I]
Extended=NO

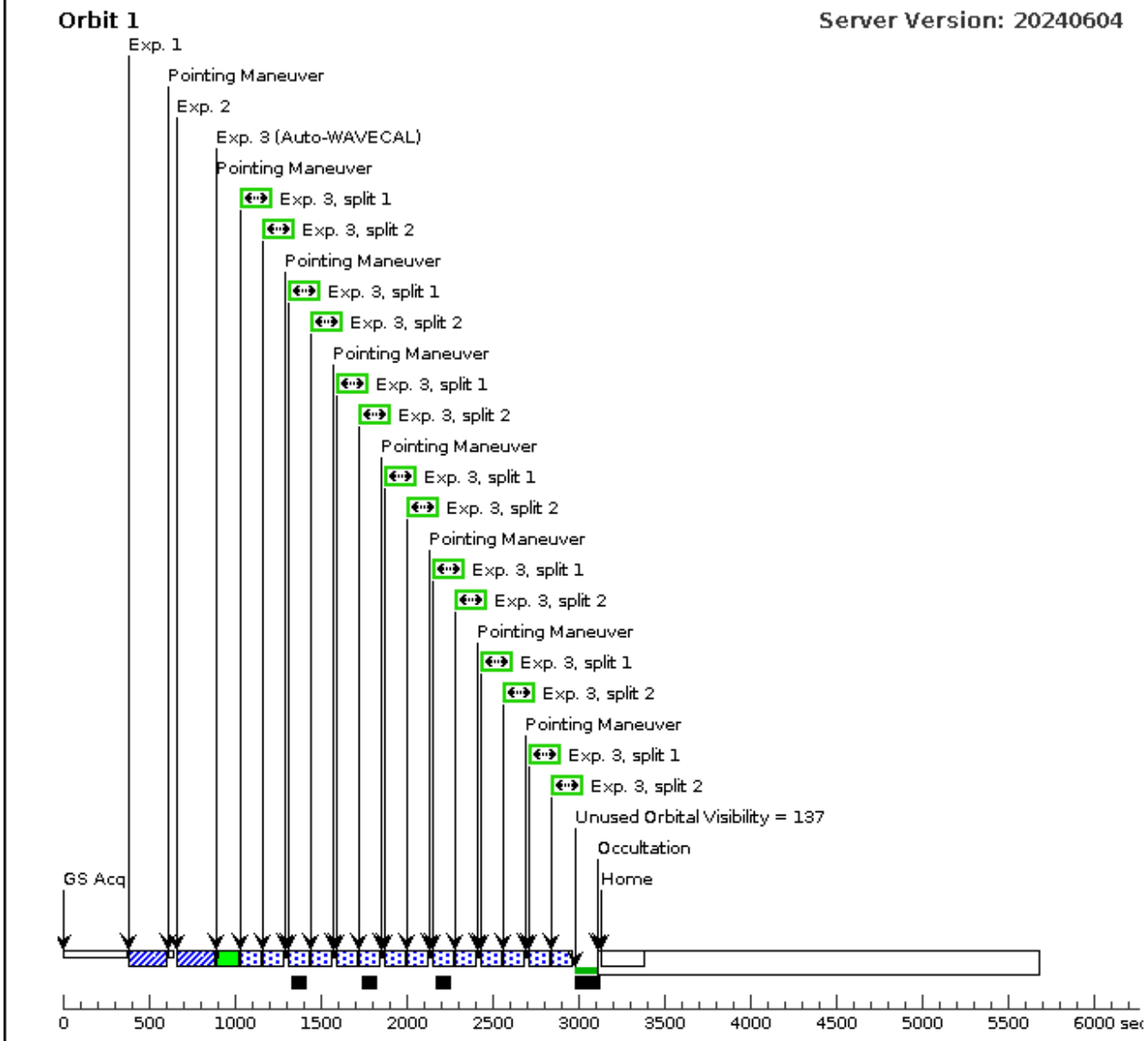
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	NGC3603-A1	RA: 11 15 7.2765 (168.7803187d)		V=11.18+/-0.03	Reference Frame: ICRS
		Dec: -61 15 38.39 (-61.26066d)		B-V=1.03	
		Equinox: J2000			

Comments: Positions have been measured on numerous HST/STIS images as the Gaia position is affected by crowded. Similarly the Gaia proper motion cannot be trusted. Instead, the average cluster proper motion has been adopted and applied to the Cycle 31 time frame. V-band magnitude measured from ACS/HRC frame J9EU05040 taken at phase 0.25, i.e., out of eclipse, and thus a good representation of the brightness for our observations here.
Category=STAR
Description=[EMISSION LINE STAR, SUPERGIANT O, WOLF RAYET - WN]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1889175)	(1) NGC3603-A1-OFFSET	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT	PHASE 0.20 TO 0.30		0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	(1889176)	(2) NGC3603-A1	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
3	(STIS.sp.1889174)	(2) NGC3603-A1	STIS/CCD, ACCUM, 52X0.1E1	G430M 3843 A	CR-SPLIT=2		Pattern 1, Exps 3-3 in Visit2Try2Phase25B (05) (1)	165 Secs (1155 Secs)	
								[==>(Pattern 1, Split 1)]	***[1]***
								[==>(Pattern 1, Split 2)]	
								[==>(Pattern 2, Split 1)]	
								[==>(Pattern 2, Split 2)]	
								[==>(Pattern 3, Split 1)]	
								[==>(Pattern 3, Split 2)]	
								[==>(Pattern 4, Split 1)]	
								[==>(Pattern 4, Split 2)]	
								[==>(Pattern 5, Split 1)]	
								[==>(Pattern 5, Split 2)]	
								[==>(Pattern 6, Split 1)]	
								[==>(Pattern 6, Split 2)]	
								[==>(Pattern 7, Split 1)]	
								[==>(Pattern 7, Split 2)]	

Orbit Structure



Visit

Proposal 17527, Visit4Try2Phase75B (06), failed Tue Nov 26 23:00:26 GMT 2024

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 61D TO 103 D; ORIENT 176D TO 182 D; ORIENT 249D TO 292 D; ORIENT 346D TO 11 D; AFTER 03 BY 3 D TO 500 D; Period 3.77298 D AND ZERO-PHASE HJD2456161.3650

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=7	Angle Between Sides=		
	Point Spacing=0.50	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC3603-A1-OFFSET	RA: 11 15 7.6261 (168.7817754d)		V=12.23+/-0.03	Reference Frame: ICRS
		Dec: -61 15 17.56 (-61.25488d)		B-V=1.42	
		Equinox: J2000			

Comments: Proper motion has been applied to bring the coordinates to circa Cycle 31 from Gaia 2016 epoch.
Category=STAR
Description=[B0-B2 III-I]
Extended=NO

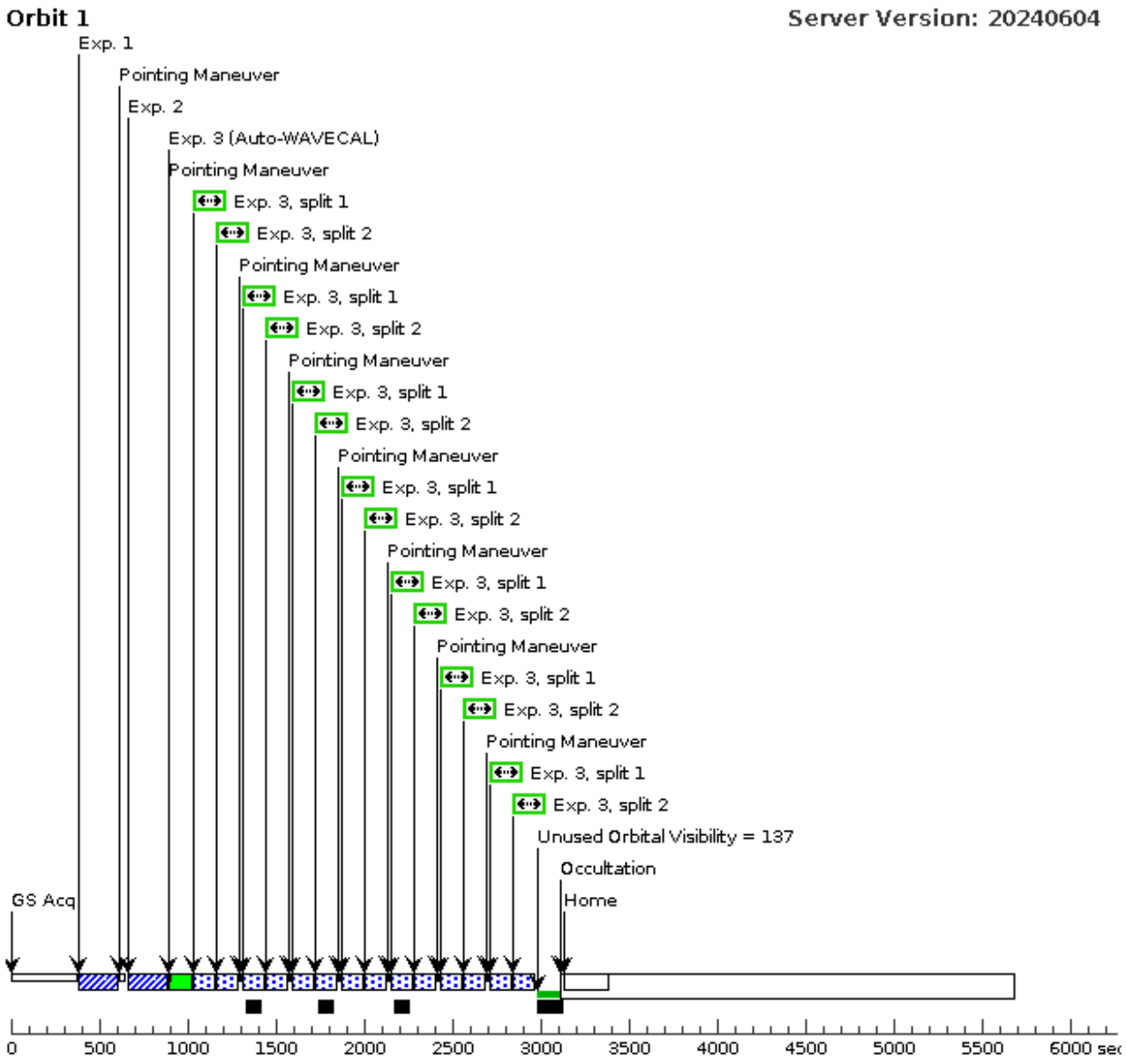
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	NGC3603-A1	RA: 11 15 7.2765 (168.7803187d)		V=11.18+/-0.03	Reference Frame: ICRS
		Dec: -61 15 38.39 (-61.26066d)		B-V=1.03	
		Equinox: J2000			

Comments: Positions have been measured on numerous HST/STIS images as the Gaia position is affected by crowded. Similarly the Gaia proper motion cannot be trusted. Instead, the average cluster proper motion has been adopted and applied to the Cycle 31 time frame. V-band magnitude measured from ACS/HRC frame J9EU05040 taken at phase 0.25, i.e., out of eclipse, and thus a good representation of the brightness for our observations here.
Category=STAR
Description=[EMISSION LINE STAR, SUPERGIANT O, WOLF RAYET - WN]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1889175)	(1) NGC3603-A1-OFFSET	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT	PHASE 0.70 TO 0.80		0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	(1889176)	(2) NGC3603-A1	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
3	(STIS.sp.1889174)	(2) NGC3603-A1	STIS/CCD, ACCUM, 52X0.1E1	G430M 3843 A	CR-SPLIT=2		Pattern 1, Exps 3-3 in Visit4Try2Phase75B (06) (1)	165 Secs (1155 Secs)	
								[==>(Pattern 1, Split 1)]	***[1]***
								[==>(Pattern 1, Split 2)]	
								[==>(Pattern 2, Split 1)]	
								[==>(Pattern 2, Split 2)]	
								[==>(Pattern 3, Split 1)]	
								[==>(Pattern 3, Split 2)]	
								[==>(Pattern 4, Split 1)]	
								[==>(Pattern 4, Split 2)]	
								[==>(Pattern 5, Split 1)]	
								[==>(Pattern 5, Split 2)]	
								[==>(Pattern 6, Split 1)]	
								[==>(Pattern 6, Split 2)]	
								[==>(Pattern 7, Split 1)]	
								[==>(Pattern 7, Split 2)]	

Orbit Structure



Visit

Proposal 17527, Visit4Try3Phase75B (07) Tue Nov 26 23:00:26 GMT 2024

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 61D TO 103 D; ORIENT 176D TO 182 D; ORIENT 249D TO 292 D; ORIENT 346D TO 11 D; AFTER 03 BY 3 D TO 500 D; Period 3.77298 D AND ZERO-PHASE HJD2456161.3650

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=7	Angle Between Sides=		
	Point Spacing=0.50	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC3603-A1-OFFSET	RA: 11 15 7.6261 (168.7817754d)		V=12.23+/-0.03	Reference Frame: ICRS
		Dec: -61 15 17.56 (-61.25488d)		B-V=1.42	
		Equinox: J2000			

Comments: Proper motion has been applied to bring the coordinates to circa Cycle 31 from Gaia 2016 epoch.
Category=STAR
Description=[B0-B2 III-I]
Extended=NO

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	NGC3603-A1	RA: 11 15 7.2765 (168.7803187d)		V=11.18+/-0.03	Reference Frame: ICRS
		Dec: -61 15 38.39 (-61.26066d)		B-V=1.03	
		Equinox: J2000			

Comments: Positions have been measured on numerous HST/STIS images as the Gaia position is affected by crowded. Similarly the Gaia proper motion cannot be trusted. Instead, the average cluster proper motion has been adopted and applied to the Cycle 31 time frame. V-band magnitude measured from ACS/HRC frame J9EU05040 taken at phase 0.25, i.e., out of eclipse, and thus a good representation of the brightness for our observations here.
Category=STAR
Description=[EMISSION LINE STAR, SUPERGIANT O, WOLF RAYET - WN]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(1889175)	(1) NGC3603-A1-OFFSET	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT	PHASE 0.70 TO 0.80		0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
2	(1889176)	(2) NGC3603-A1	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				0.1 Secs (0.1 Secs)	
								[==>]	***[1]***
3	(STIS.sp.1889174)	(2) NGC3603-A1	STIS/CCD, ACCUM, 52X0.1E1	G430M 3843 A	CR-SPLIT=2		Pattern 1, Exps 3-3 in Visit4Try3Phase75B (07) (1)	165 Secs (1281 Secs)	
								[==>91.5 Secs (Pattern 1, Split 1)]	***[1]***
								[==>91.5 Secs (Pattern 1, Split 2)]	
								[==>91.5 Secs (Pattern 2, Split 1)]	
								[==>91.5 Secs (Pattern 2, Split 2)]	
								[==>91.5 Secs (Pattern 3, Split 1)]	
								[==>91.5 Secs (Pattern 3, Split 2)]	
								[==>91.5 Secs (Pattern 4, Split 1)]	
								[==>91.5 Secs (Pattern 4, Split 2)]	
								[==>91.5 Secs (Pattern 5, Split 1)]	
								[==>91.5 Secs (Pattern 5, Split 2)]	
								[==>91.5 Secs (Pattern 6, Split 1)]	
								[==>91.5 Secs (Pattern 6, Split 2)]	
								[==>91.5 Secs (Pattern 7, Split 1)]	
								[==>91.5 Secs (Pattern 7, Split 2)]	

Orbit Structure