



17732 - UV spectroscopy of the complete sample of Wolf-Rayet stars in the low-metallicity galaxy NGC 6822

Cycle: 32, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

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Daniel Pauli (CoI) (ESA Member)	Universitat Potsdam
Roel Lefever (CoI) (ESA Member)	Astronomisches Rechen-Institut Heidelberg
Dr. Derck L. Massa (CoI) (AdminUSPI)	Space Science Institute
Dr. Tomer Shenar (CoI)	Tel Aviv University

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) AM85-NGC-6822-3	COS/FUV COS/NUV	5	16-Aug-2024 11:01:33.0	yes
02	(2) AM85-NGC-6822-4	COS/FUV COS/NUV	5	16-Aug-2024 11:01:34.0	yes

<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>
03	(3) AM85-NGC-6822-5	COS/FUV COS/NUV	5	16-Aug-2024 11:01:35.0	yes
04	(4) AM85-NGC-6822-12	COS/FUV COS/NUV	5	16-Aug-2024 11:01:36.0	yes

20 Total Orbits Used

ABSTRACT

We propose the first UV spectroscopic study of the complete sample of four Wolf-Rayet (WR) stars in the low-metallicity galaxy NGC6822. WR stars are rare objects which represent the final evolutionary stage of most massive stars short before their collapse into black holes, and are important feedback sources. Low-metallicity WR stars are enigmatic but, arguably, the most important testbeds of the final stages of massive star evolution in conditions resembling those in the early Universe. The new COS spectra of the strategically important sample of low-metallicity WR stars are urgently needed to complement existing optical spectra, which by themselves are not sufficient to fully characterize these objects with strong winds. The HST data will be exploited to measure stellar and wind parameters using modern stellar atmosphere models. The determined mass-loss rates and wind velocities will be compared to those of WR stars in different galaxies, such as the Milky Way, the LMC, and the SMC, and used to anchor the metallicity dependence of WR wind strengths. The derived stellar parameters will test massive-star evolution models and allow a comparative study of low-metallicity WR stars in the SMC and NGC6822. If we find that WR stars in NGC6822 resemble the so far unique population of WR stars in the SMC (which fundamentally differs from the WR stars in galaxies with higher metallicity), it will disrupt the standard picture of black hole progenitors and stellar feedback at low metallicities, and by proxy in the young Universe. Obtaining the UV spectra of WR stars in NGC6822 is a necessary addition to the HST legacy and will resonate across many areas of astrophysics.

OBSERVING DESCRIPTION

COS G140L spectra of four Wolf-Rayet stars in the galaxy NGC 6822. Four visits - one per target, 5 orbits each. The targets have $V \sim 20$. The coordinates are from Gaia DR3.

- 1) The targets are relatively isolated, as also confirmed by the 'target confirmation' tool. The ETC suggest small exp. times for img aqc, therefore we use this option. We hope this is fine.
- 2) We could not find optimum FP-POS, the apt gives warning on inefficient use. We would be very grateful for recommendation how to improve our

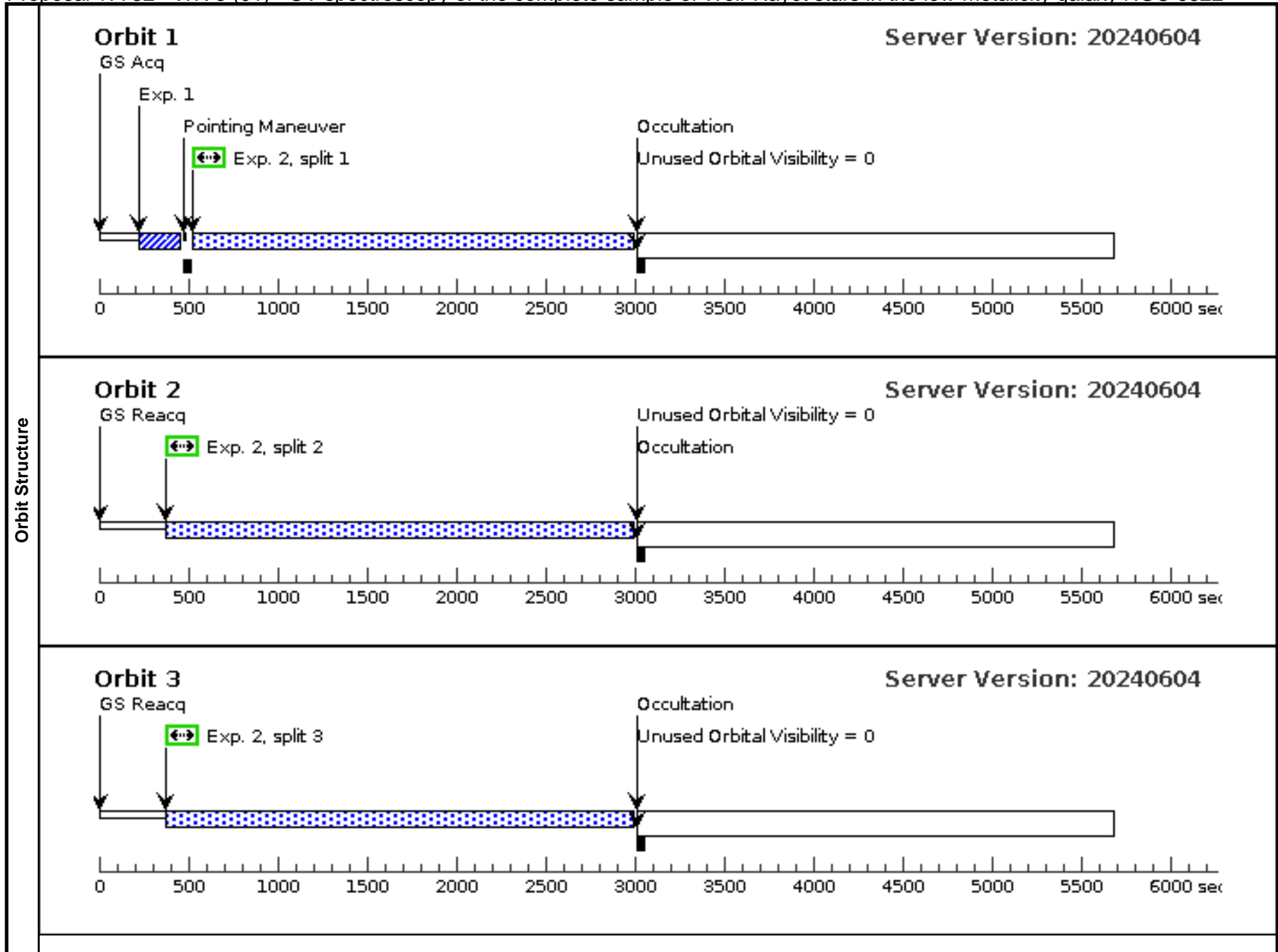
strategy

3) We indicate buffer time 10000 sec, ie. $2/3$ of buffer time calculated by the ETC. But we are not sure this is the optimum option and would be very grateful for your recommendations.

Proposal 17732 - WR 3 (01) - UV spectroscopy of the complete sample of Wolf-Rayet stars in the low-metallicity galaxy NGC 6822

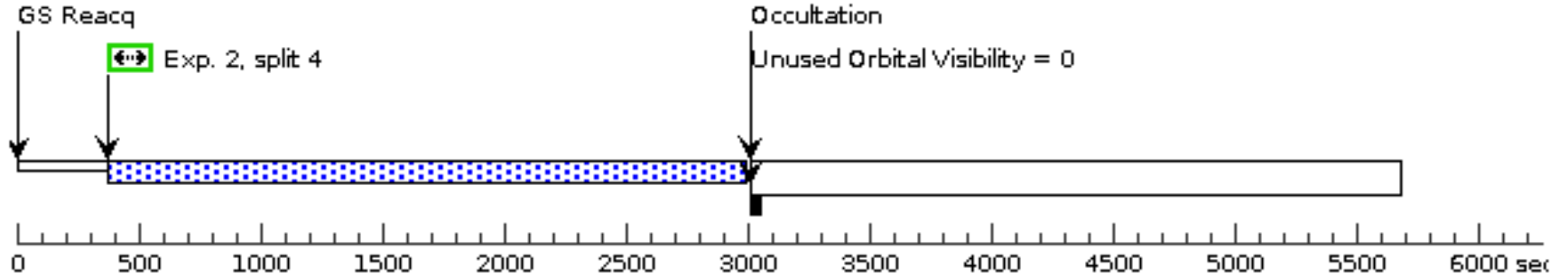
Fri Aug 16 15:01:37 GMT 2024

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	(WR 3 (01)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	AM85-NGC-6822-3	RA: 19 44 31.9735 (296.1332229d) Dec: -14 44 9.35 (-14.73593d) Equinox: J2000	Epoch of Position: 2016	V=19.69	Reference Frame: ICRS				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=STAR Description=[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	ACQ WR 3 (COS.ta.193 2-3 2537)	(1) AM85-NGC-682 2-3	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				10 Secs (10 Secs) [==>]	[1]
	2	4 orbits (COS.sp.193 2-3 2917)	(1) AM85-NGC-682 2-3	COS/FUV, TIME-TAG, PSA	G140L 800 A	BUFFER-TIME=10000; FLASH=YES; FP-POS=ALL			3200 Secs (9978 Secs) [==>2265.0 Secs (Split 1)]	[1]
									[==>2571.0 Secs (Split 2)]	[2]
									[==>2571.0 Secs (Split 3)]	[3]
[==>2571.0 Secs (Split 4)]									[4]	
3	1 orbit (COS.sp.191 2-3 9394)	(1) AM85-NGC-682 2-3	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=ALL; BUFFER-TIME=3200			500 Secs (2226 Secs) [==>520.0 Secs (Split 1)] [==>520.0 Secs (Split 2)] [==>520.0 Secs (Split 3)] [==>666.0 Secs (Split 4)]	[5]	



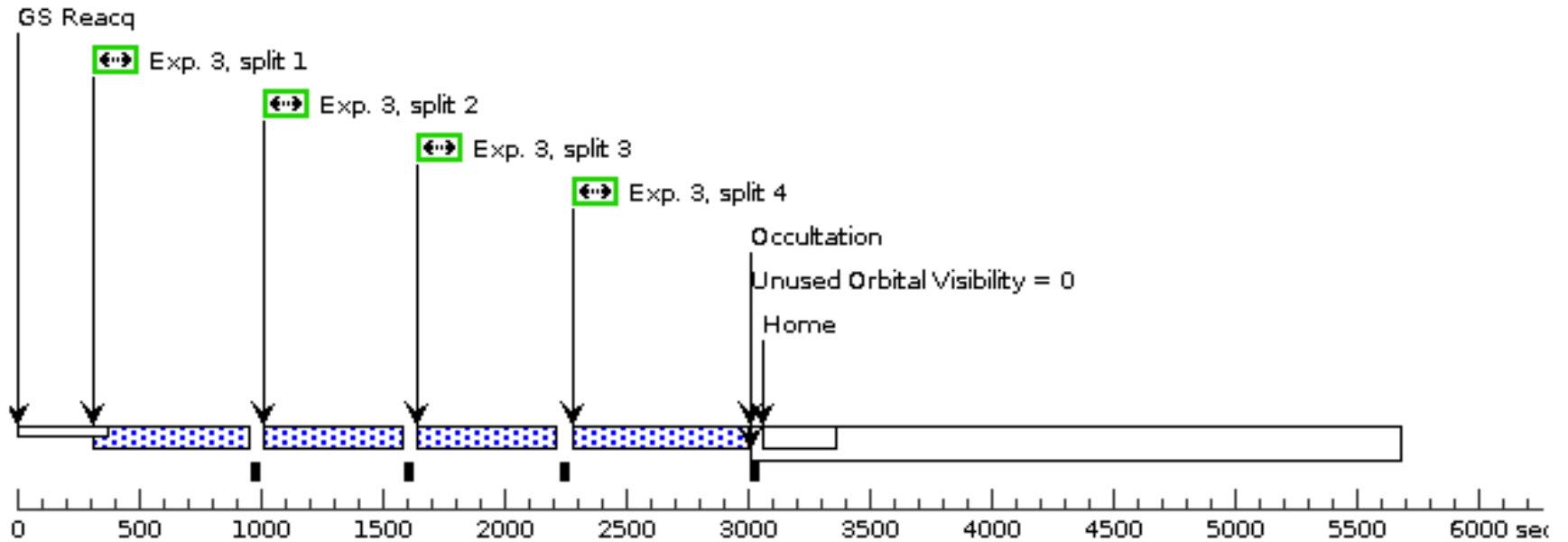
Orbit 4

Server Version: 20240604



Orbit 5

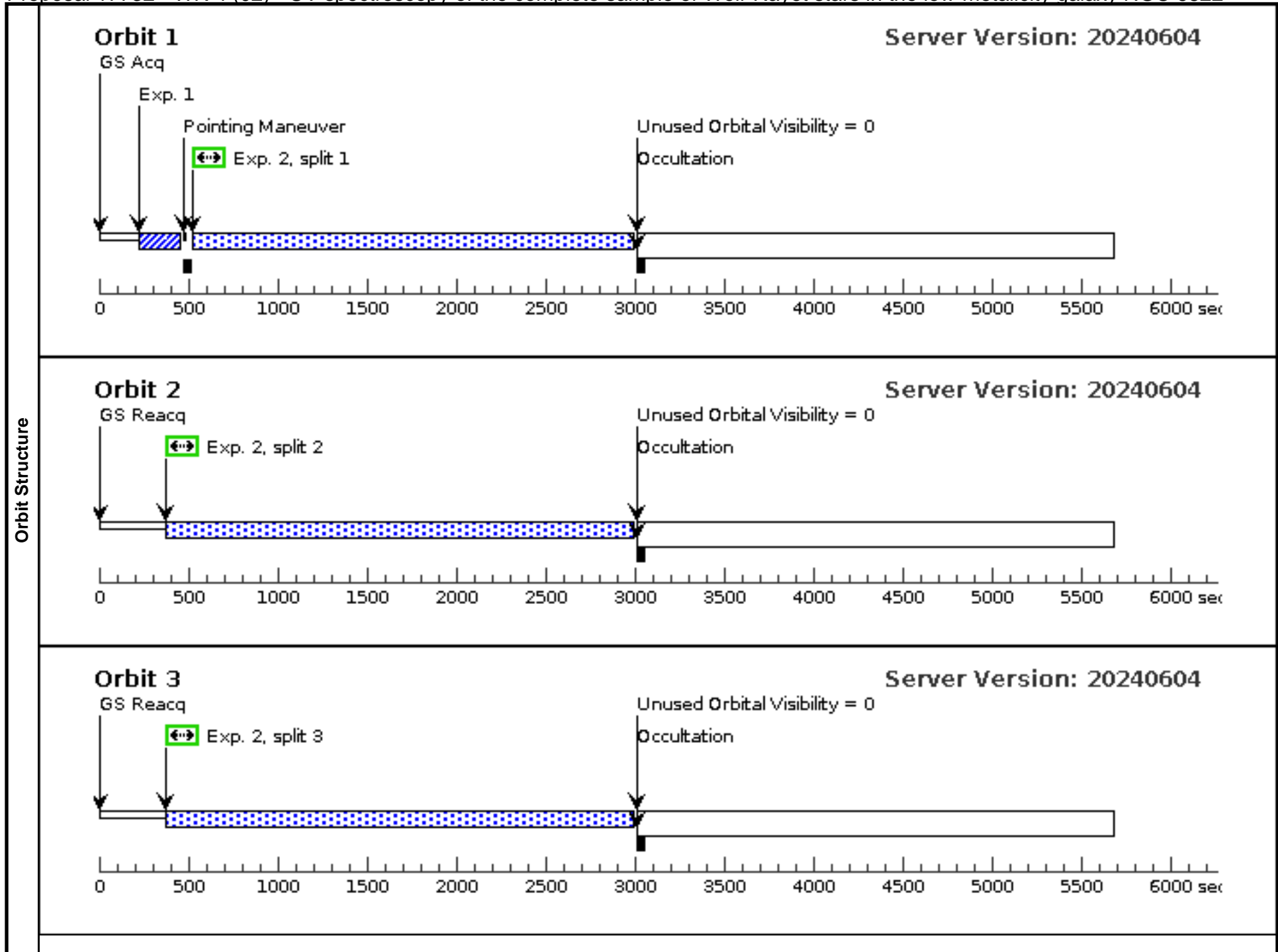
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Proposal 17732 - WR 4 (02) - UV spectroscopy of the complete sample of Wolf-Rayet stars in the low-metallicity galaxy NGC 6822

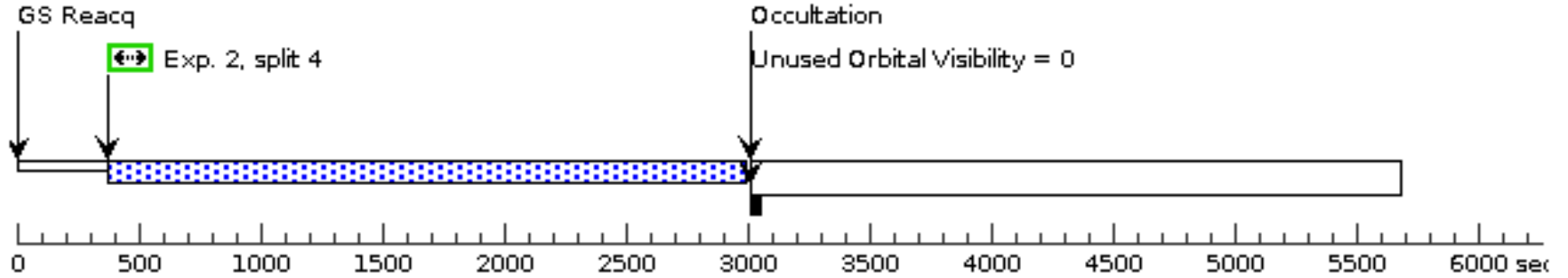
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	Diagnosics (WR 4 (02)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS										
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous					
	(2)	AM85-NGC-6822-4	RA: 19 44 37.9598 (296.1581658d) Dec: -14 51 6.80 (-14.85189d) Equinox: J2000	Epoch of Position: 2016	V=19.83	Reference Frame: ICRS					
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=STAR Description=[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	ACQ WR 3 (COS.ta.193 3709)	(2) AM85-NGC-682 2-4	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				10 Secs (10 Secs) [==>]	[1]	
	2	4 orbits (COS.sp.193 3745)	(2) AM85-NGC-682 2-4	COS/FUV, TIME-TAG, PSA	G140L 800 A		BUFFER-TIME=10000; FLASH=YES; FP-POS=ALL			3200 Secs (9978 Secs)	
										[==>2265.0 Secs (Split 1)]	[1]
										[==>2571.0 Secs (Split 2)]	[2]
										[==>2571.0 Secs (Split 3)]	[3]
									[==>2571.0 Secs (Split 4)]	[4]	
3	1 orbit (COS.sp.191 9394)	(2) AM85-NGC-682 2-4	COS/FUV, TIME-TAG, PSA	G140L 800 A		FP-POS=ALL; BUFFER-TIME=10000; FLASH=YES			500 Secs (2254 Secs)		
									[==>527.0 Secs (Split 1)]		
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									[==>527.0 Secs (Split 3)]		
								[==>673.0 Secs (Split 4)]	[5]		



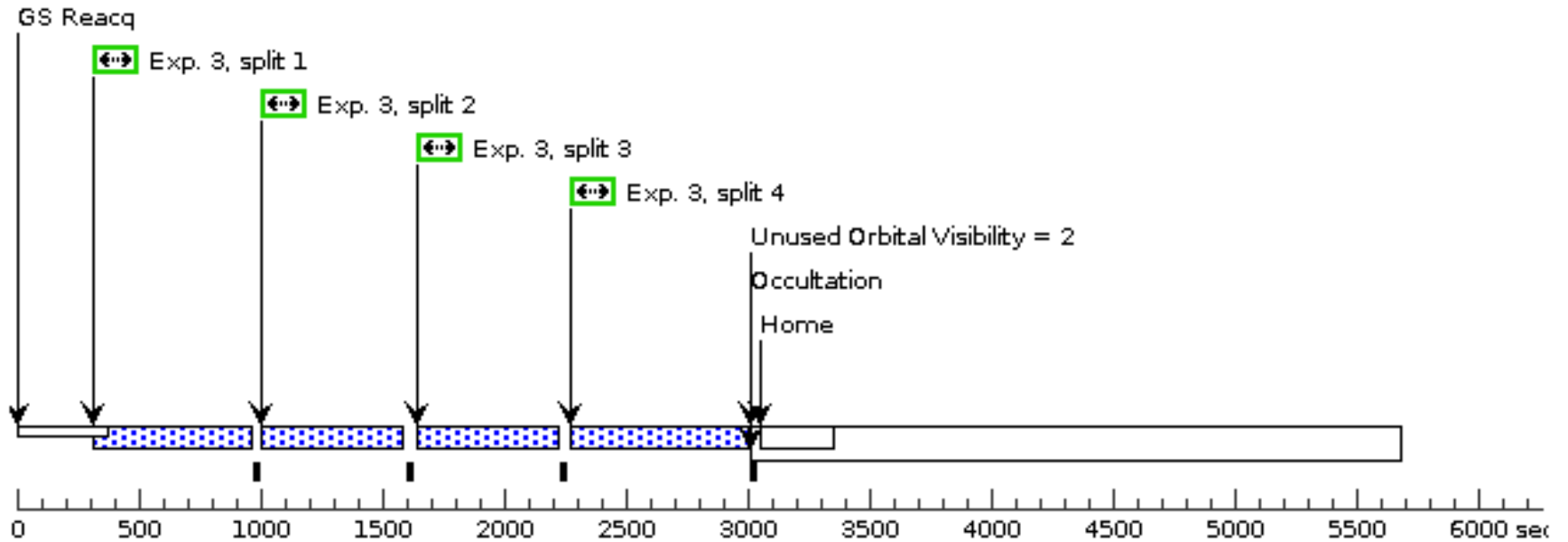
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Orbit 5

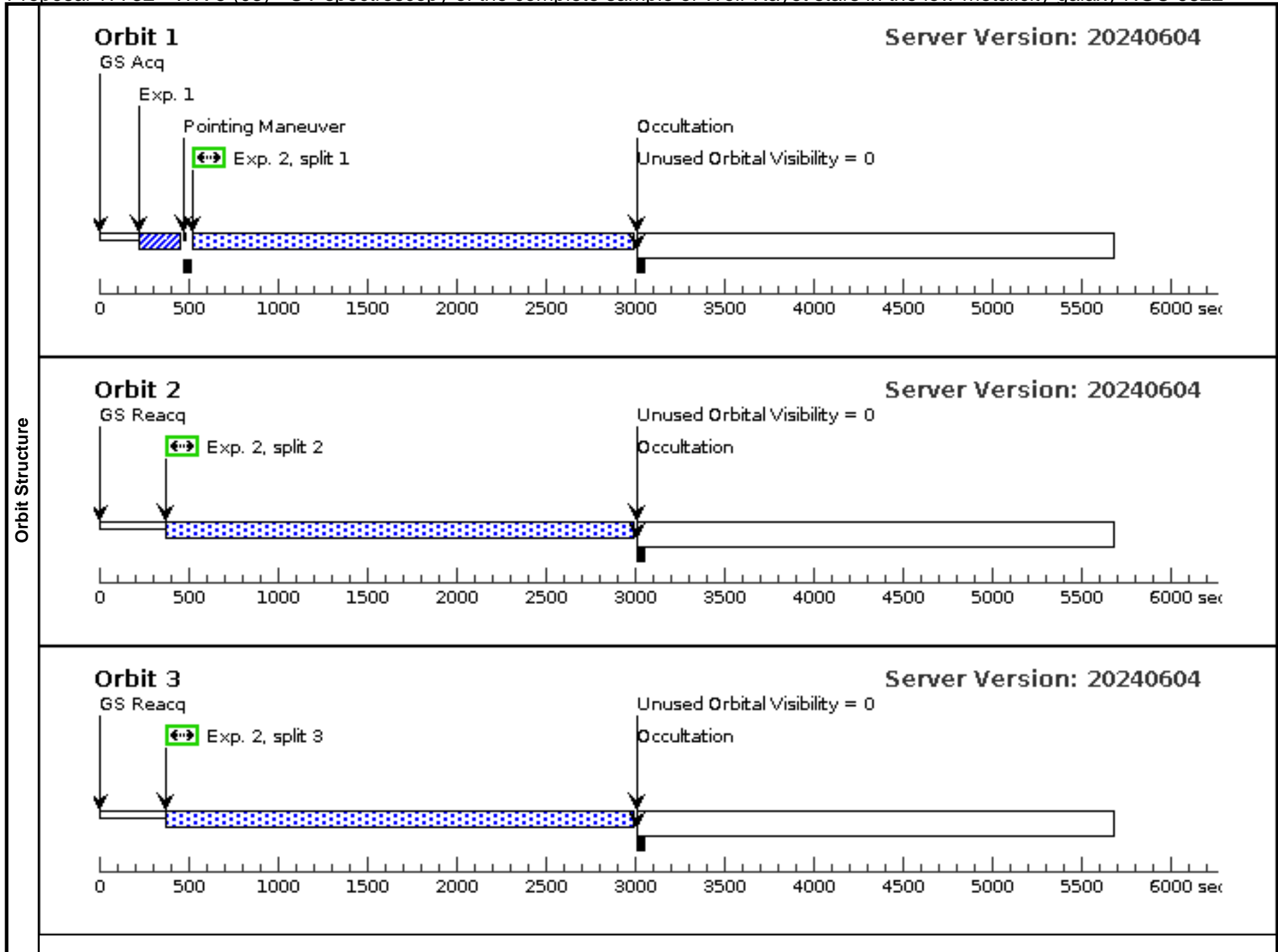
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Proposal 17732 - WR 5 (03) - UV spectroscopy of the complete sample of Wolf-Rayet stars in the low-metallicity galaxy NGC 6822

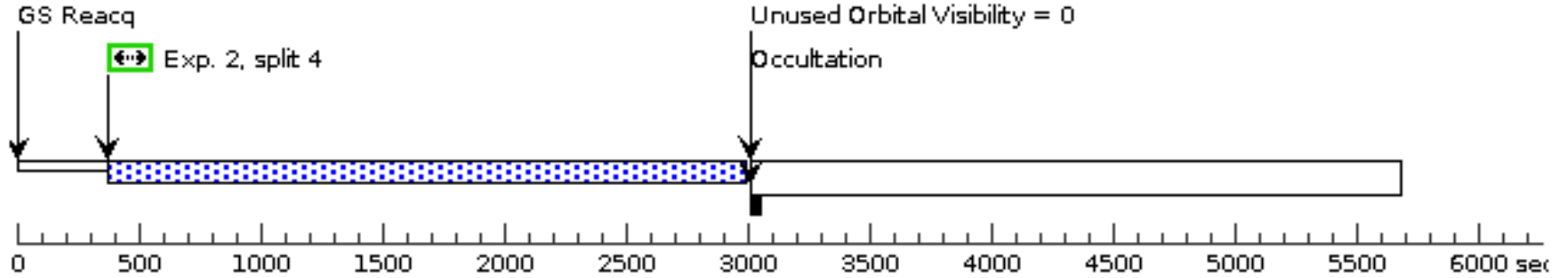
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Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(3)	AM85-NGC-6822-5	RA: 19 44 49.3465 (296.2056104d) Dec: -14 45 40.22 (-14.76117d) Equinox: J2000	Epoch of Position: 2015.5	V=19.72	Reference Frame: ICRS				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=STAR Description=[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	ACQ WR 5 (COS.ta.193 3718)	(3) AM85-NGC-682 2-5	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				10 Secs (10 Secs) [==>]	[1]
	2	4 orbits (COS.sp.193 3743)	(3) AM85-NGC-682 2-5	COS/FUV, TIME-TAG, PSA	G140L 800 A	BUFFER-TIME=10000; FLASH=YES; FP-POS=ALL			3200 Secs (9978 Secs) [==>2265.0 Secs (Split 1)]	[1]
									[==>2571.0 Secs (Split 2)]	[2]
									[==>2571.0 Secs (Split 3)]	[3]
[==>2571.0 Secs (Split 4)]									[4]	
3	1 orbit (COS.sp.191 9394)	(3) AM85-NGC-682 2-5	COS/FUV, TIME-TAG, PSA	G140L 800 A	FP-POS=ALL; BUFFER-TIME=10000; FLASH=YES			500 Secs (2254 Secs) [==>527.0 Secs (Split 1)] [==>527.0 Secs (Split 2)] [==>527.0 Secs (Split 3)] [==>673.0 Secs (Split 4)]	[5]	



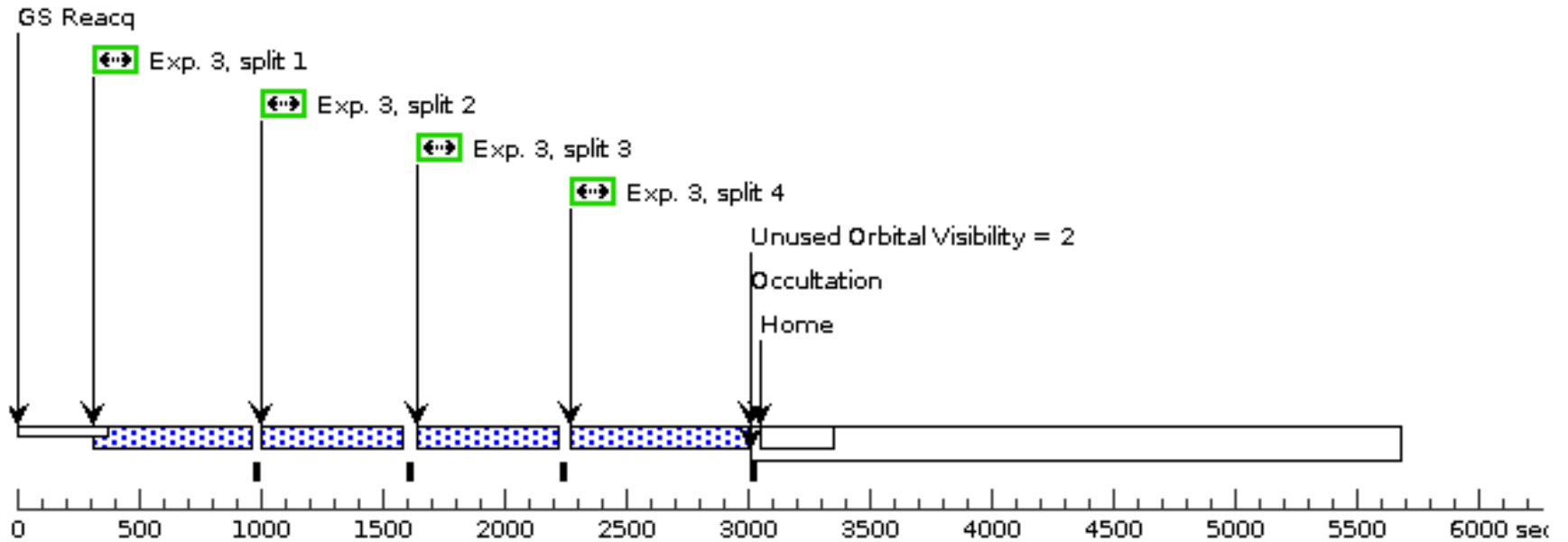
Orbit 4

Server Version: 20240604



Orbit 5

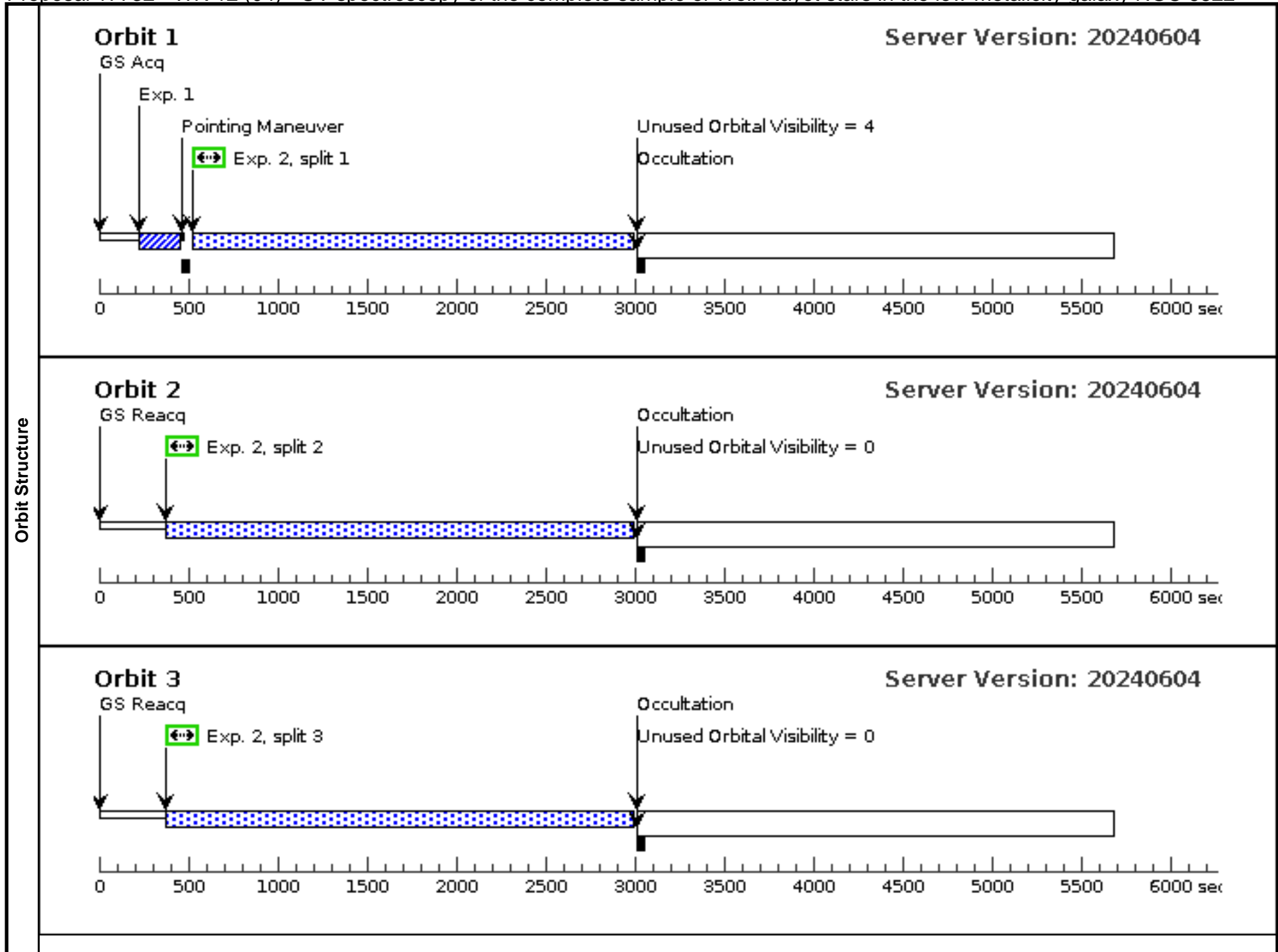
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Proposal 17732 - WR 12 (04) - UV spectroscopy of the complete sample of Wolf-Rayet stars in the low-metallicity galaxy NGC 6822

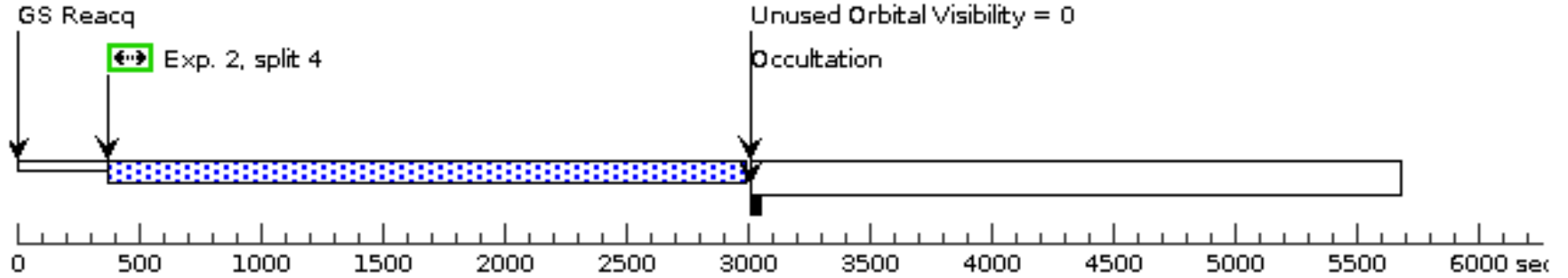
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Visit	Proposal 17732, WR 12 (04) Diagnostic Status: Warning Scientific Instruments: COS/FUV, COS/NUV Special Requirements: (none)																																																															
	Diagnosics (WR 12 (04)) Warning (Orbit Planner): INEFFICIENT ORDERING OF FP-POS POSITIONS																																																															
Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(4)</td> <td>AM85-NGC-6822-12</td> <td>RA: 19 45 13.4870 (296.3061958d) Dec: -14 45 13.28 (-14.75369d) Equinox: J2000</td> <td>Epoch of Position: 2016</td> <td>V=18.96</td> <td>Reference Frame: ICRS</td> </tr> </tbody> </table> <p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=STAR Description=[WOLF RAYET - WN] Extended=NO</p>										#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(4)	AM85-NGC-6822-12	RA: 19 45 13.4870 (296.3061958d) Dec: -14 45 13.28 (-14.75369d) Equinox: J2000	Epoch of Position: 2016	V=18.96	Reference Frame: ICRS																																										
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