13430 - The temperatures, masses and pulsation modes of three ZZ Cetis in the Kepler field

Cycle: 21, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
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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) KIC-4552982	COS/FUV COS/NUV	4	11-Jul-2013 19:58:05.0	yes

4 Total Orbits Used

ABSTRACT

Most stars in our Galaxy, including all known planet hosts, will end or have already ended their lives as white dwarfs, dense stellar remnants sustained by electron degeneracy. Here, we propose to obtain COS far-ultraviolet spectroscopy of three pulsating hydrogen-atmosphere (DA) white dwarfs (ZZ Ceti stars) that for which we are obtaining Kepler short-cadence data. Far-ultraviolet spectroscopy of white dwarfs, covering the H2/H2+ quasi-molecular satellites around 1400A and 1600A, is essential to determine accurate atmospheric parameters, and precision asteroseismology of white dwarfs has the potential to probe in detail the structure of their cores and envelopes that is not possible in any other way. A succesful

asteroseismologial analysis requires, however, the correct identification of the pulsation modes. Because ZZ Ceti stars have typically only few large-amplitude modes, the mode identification based on their optical light curves is often ambiguous. Because the ratio of ultraviolet-to-optical pulsation amplitudes depends strongly on the pulsatoin mode, our COS data will also enable us to identify the pulsation modes in the Kepler light curves of these three stars. The unique combination of HST and Kepler observations will enable to investigate the atmospheric and internal structure of three white dwarfs with an unprecedented accuracy. The proposed research is part of the PI's doctoral thesis.

OBSERVING DESCRIPTION

The aim of the observation is to obtain a far-ultraviolet spectrum of a ZZ Ceti (pulsating DA white dwarf) in the Kepler field. The sequence is straight-forward: an imaging target acquisition, followed by G140L spectroscopy using all four FP-POS positions.

ADDITIONAL COMMENTS

As this is part of Ms Greiss PhD work, it would be very helpful if the observations could be scheduled early in Cycle 21. Ms Greiss plans to submit her Thesis by February 2014.

Visit

Proposal 13430, Visit 01 Thu Jul 11 23:58:14 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: (none)

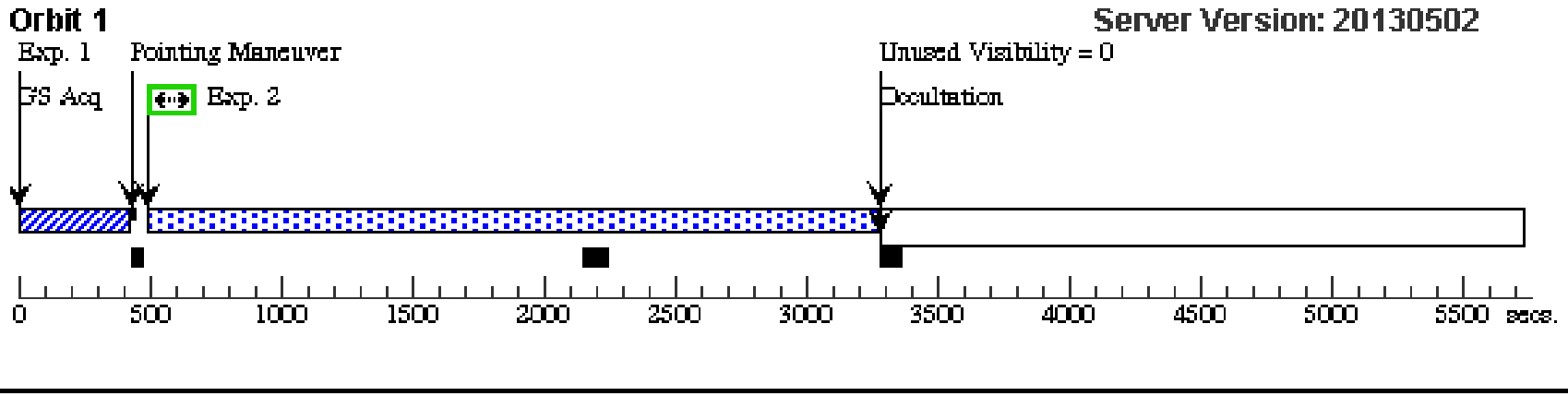
Fixed Targets

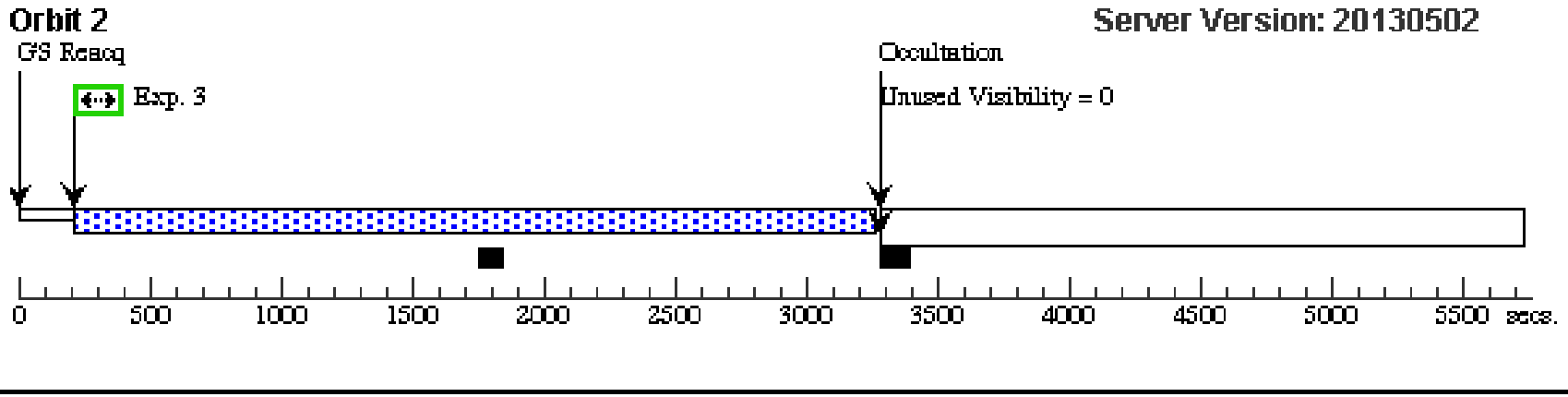
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	KIC-4552982	RA: 19 16 43.8240 (289.1826000d) Dec: +39 38 49.39 (39.64705d) Equinox: J2000	Proper Motion RA: 21.0 mas/yr Proper Motion Dec: 49.9 mas/yr Epoch of Position: 2000	V=17.6+/-0.1	Reference Frame: ICRS

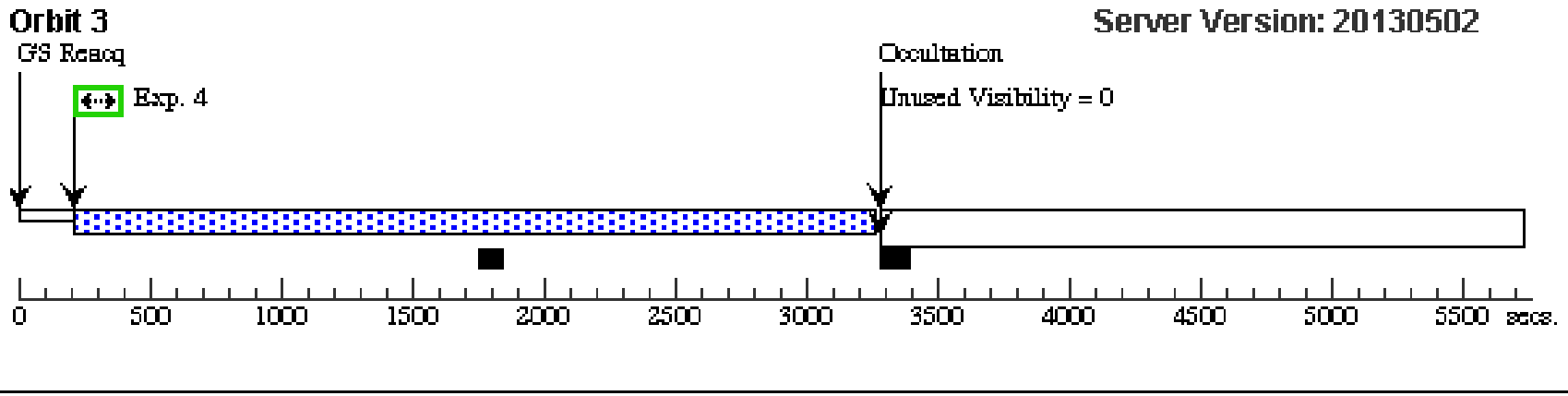
Exposures

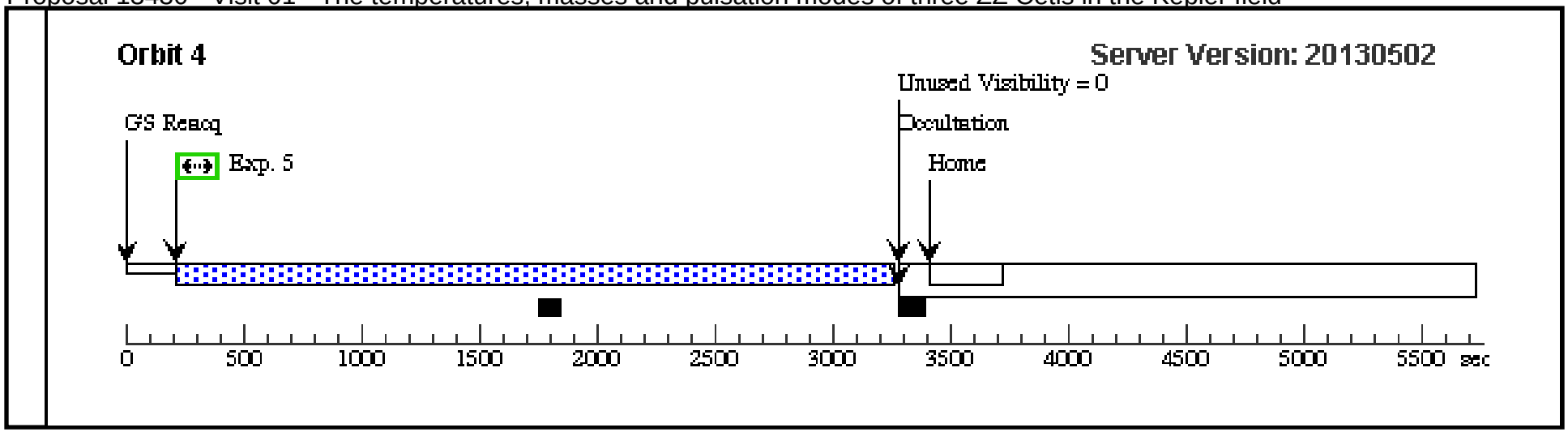
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/Image (COS.ta.516699)	(1) KIC-4552982	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				9 Secs (9 Secs) *[==>]*	*[1]*
2	KIC4552982 COS/G140LM FP-POS=1 (COS.sp.516701)	(1) KIC-4552982	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=1500; FLASH=YES; FP-POS=1			2603 Secs (2603 Secs) *[==>]*	*[1]*
3	KIC4552982 COS/G140LM FP-POS=2 (COS.sp.516701)	(1) KIC-4552982	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=1500; FLASH=YES; FP-POS=2			3001 Secs (3001 Secs) *[==>]*	*[2]*
4	KIC4552982 COS/G140LM FP-POS=3 (COS.sp.516701)	(1) KIC-4552982	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=1500; FLASH=YES; FP-POS=3			3001 Secs (3001 Secs) *[==>]*	*[3]*
5	KIC4552982 COS/G140LM FP-POS=4 (COS.sp.516701)	(1) KIC-4552982	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=1500; FLASH=YES; FP-POS=4			3001 Secs (3001 Secs) *[==>]*	*[4]*

Orbit Structure





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