11601 - UV spectroscopy of the hot bare stellar core H1504+65

Cycle: 17, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Prof. Klaus Werner (PI) (ESA Member)	**Universitat Tubingen, Institut fur Astronomie & Astrophysik**	**werner@astro.uni-tuebingen.de**
Dr. Thomas Rauch (CoI) (ESA Member)	Universitat Tubingen, Institut fur Astronomie & Astrophysik	rauch@astro.uni-tuebingen.de

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) H1504+65	COS/FUV COS/NUV	2	13-Apr-2010 21:01:08.0	yes
51	(1) H1504+65	COS/FUV COS/NUV	2	13-Apr-2010 21:01:21.0	yes

4 Total Orbits Used

ABSTRACT

H1504+65 is the hottest known white dwarf (Teff=200,000 K). It has an extraordinary surface composition. The surface is devoid of hydrogen and helium. It is mainly composed of carbon and oxygen (by equal amounts) and neon (2%). We obviously see the exposed core of a former red giant. The evolutionary history of this unique object is unknown. We have identified magnesium absorption lines in the soft X-ray photospheric Chandra spectrum, which suggests that H1504+65 may be an O-Ne-Mg white dwarf. We will test this hypothesis by abundance determinations of Mg and Na. If confirmed, then H1504+65 would be the most compelling case for the existence of single O-Ne-Mg white dwarfs.

OBSERVING DESCRIPTION

We want to use COS gratings G130M and G160M, covering the range 1132-1775A. This provides the spectral resolution needed for a quantitative analysis of the narrow metal lines. Besides prominent C and O lines this range contains many Mg VII and Na VI
suitable for spectroscopic analyses. We used the COS Exposure Time Calculator to determine the exposure times necessary to achieve S/N of about 30. From our experience with previous HST data analyses this S/N is necessary to determine abundances as accurate as 0.3 dex, which is required to answer our scientific questions.

Visit

Proposal 11601, Visit 01, failed Wed Apr 14 01:01:26 GMT 2010

Diagnostic Status: Warning

Scientific Instruments: COS/NUV, COS/FUV

Special Requirements: (none)

Diagnostics

(Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN

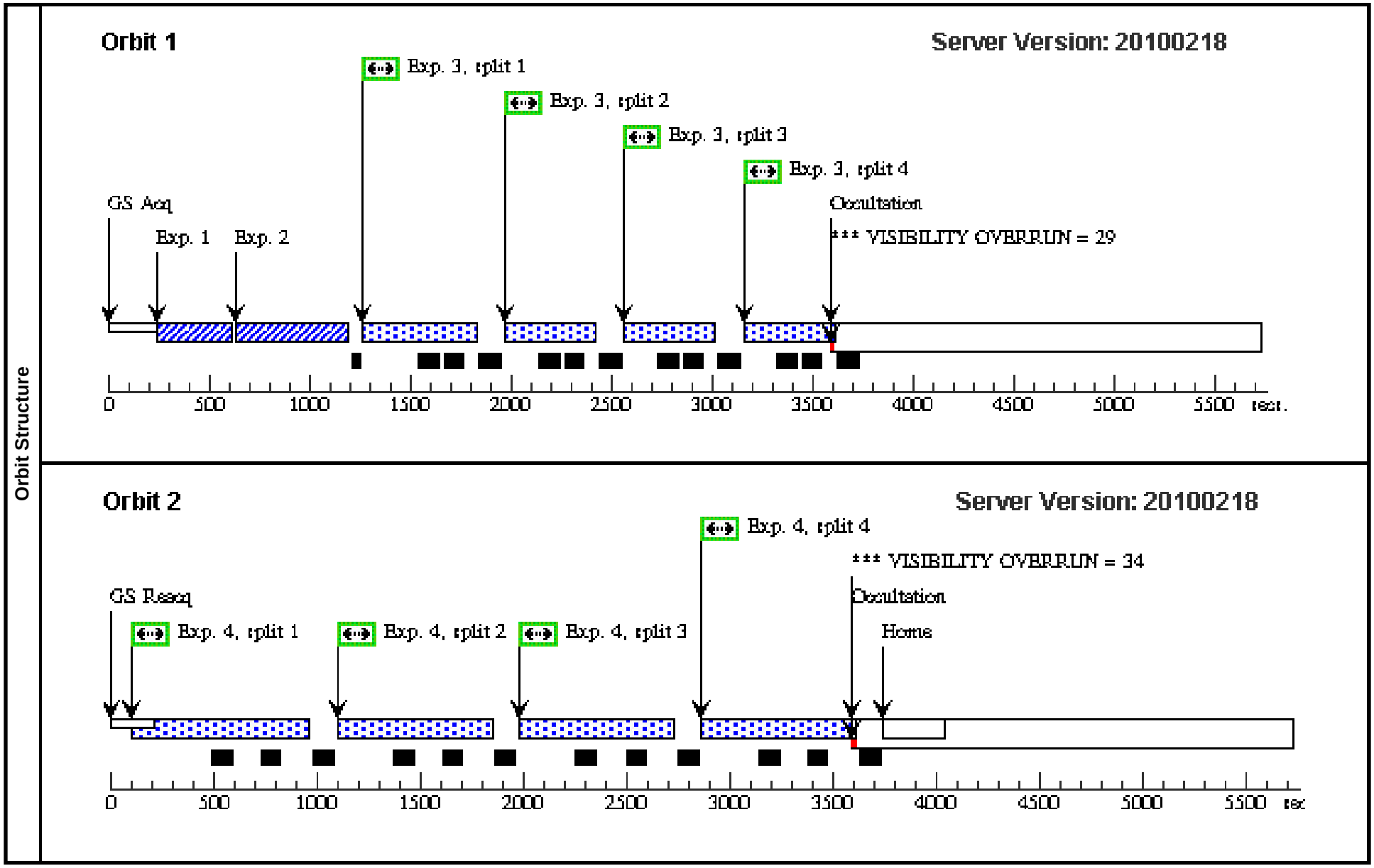
(Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	H1504+65	RA: 15 02 9.6200 (225.5400833d) Dec: +66 12 18.64 (66.20518d) Equinox: J2000		V=16.24+/-0.1	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	H1504 1a	(1) H1504+65	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	STEP-SIZE=1.767; CENTER=FLUX-WT; SCAN-SIZE=3			0.2 Secs *[==>]*	*[1]*
2	H1504 1b	(1) H1504+65	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				83 Secs *[==>]*	*[1]*
3	H1504 1c	(1) H1504+65	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=130; FP-POS=AUTO; FLASH=YES			1592 Secs *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]*	*[1]*
4	H1504 2c	(1) H1504+65	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=240; FP-POS=AUTO; FLASH=YES			2792 Secs *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]*	*[2]*


Orbit Structure
Orbit 1
Server Version: 20100218
Exp. 3, split 1
Exp. 3, split 2
Exp. 3, split 3
Exp. 3, split 4
GS Acq
Exp. 1
Exp. 2
Occultation
*** VISIBILITY OVERRUN = 29
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.
Orbit 2
Server Version: 20100218
Exp. 4, split 4
*** VISIBILITY OVERRUN = 34
GS Reacq
Occultation
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11601, Visit 51, implementation Wed Apr 14 01:01:28 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV, COS/FUV

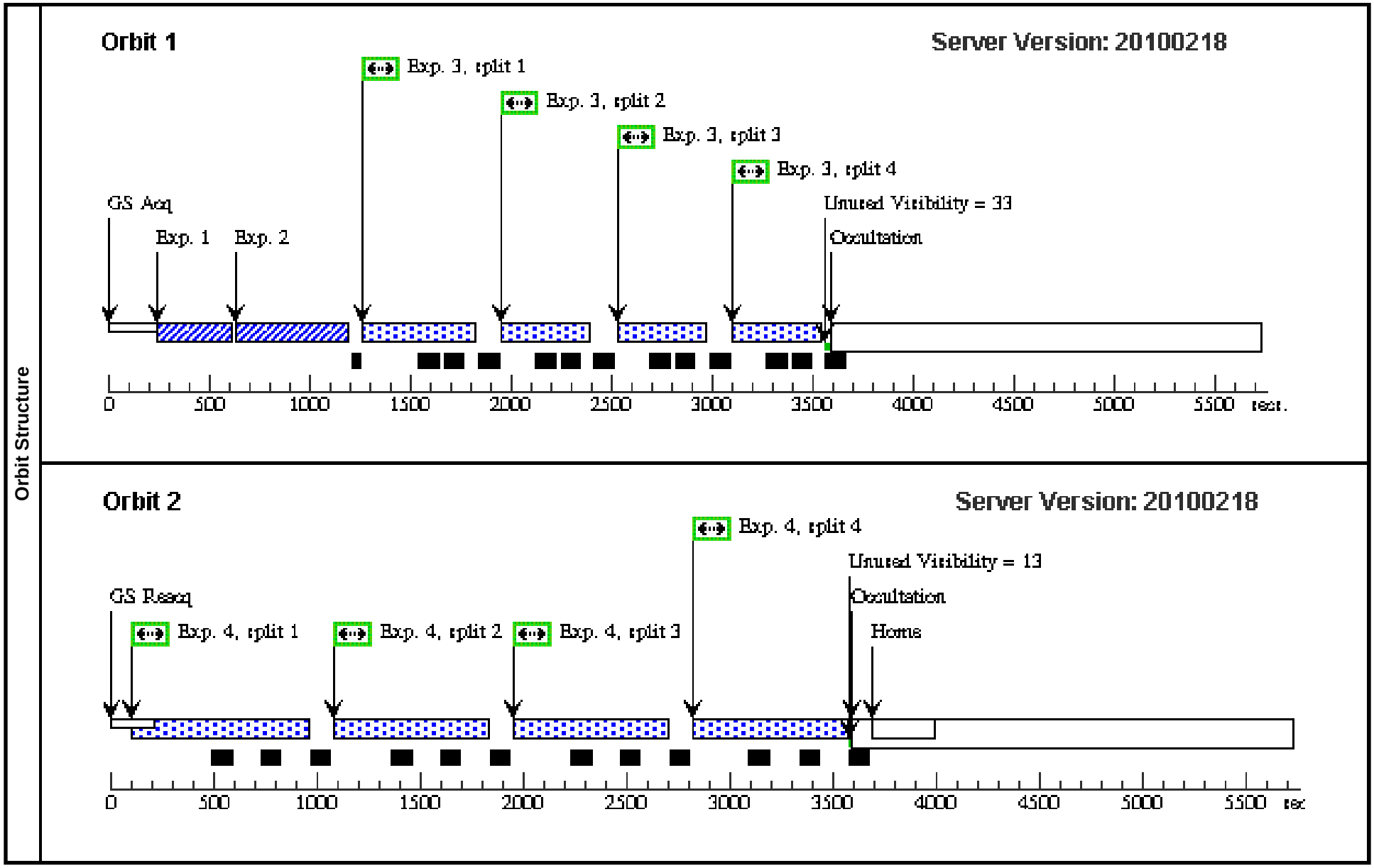
Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	H1504+65	RA: 15 02 9.6200 (225.5400833d) Dec: +66 12 18.64 (66.20518d) Equinox: J2000		V=16.24+/-0.1	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	H1504 1a	(1) H1504+65	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	STEP-SIZE=1.767; CENTER=FLUX-WT; SCAN-SIZE=3			0.2 Secs *[==>]*	***[1]***
2	H1504 1b	(1) H1504+65	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				83 Secs *[==>]*	***[1]***
3	H1504 1c	(1) H1504+65	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=1300; FP-POS=AUTO; FLASH=YES			1560 Secs *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]*	***[1]***
4	H1504 2c	(1) H1504+65	COS/FUV, TIME-TAG, PSA	G160M 1600 A	BUFFER-TIME=2400; FP-POS=AUTO; FLASH=YES			2772 Secs *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]*	***[2]***


Orbit Structure
Orbit 1
Server Version: 20100218
Exp. 3, split 1
Exp. 3, split 2
Exp. 3, split 3
Exp. 3, split 4
GS Acq
Exp. 1
Exp. 2
Unused Visibility = 33
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.
Orbit 2
Server Version: 20100218
Exp. 4, split 4
Unused Visibility = 13
GS Reacq
Occultation
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec