14768 - UV Signatures of Shock Interaction in an Eta Carinae Analog

Cycle: 24, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

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) UGC-2773-OT	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	5	29-Jul-2016 15:33:24.0	yes

5 Total Orbits Used

ABSTRACT

The optical transient in the dwarf galaxy UGC2773 that was discovered in 2009 (called UGC2773-OT) has proven to be the best known extragalactic analog of the 19th century giant luminous blue variable (LBV) eruption of Eta Carinae. While most non-supernova transients of comparable peak luminosity fade in about 100 days, UGC2773-OT is the only one that has remained in eruption for a decade, like Eta Car. Moreover, spectra of Eta Car's light echoes most closely resemble spectra of UGC2773-OT, and it had a luminous blue progenitor detected by HST. Current debate about Eta Car's eruption centers around it being powered by a super-Eddington wind, or alternatively, an explosion where a shock interacting with dense circumstellar material (CSM) powers the visible display. Interestingly, a recent study of the optical spectra of UGC2773-OT showed evidence of

shock emission reminscent of some Type IIn supernovae that are also powered by shock interaction. At visible wavelengths, however, the signatures of a very strong wind can sometimes be similar to those seen in some Type IIn supernovae. Here we propose UV spectroscopy of UGC~2773-OT to either confirm or refute the hypothesis that it has strong shock interaction occuring, by looking for unambiguous UV signatures of shock excitation. While an extremely dense wind with a pseudo photosphere will tend to fall off in flux in the UV due to line blanketing, shock diagnostics like MgII 2800, HeII 1641, and some other lines are expected to be bright in the UV, as they are in Type IIn supernovae. This is a rare opportunity to provide a fairly clean test to discriminate between two quite different models.

OBSERVING DESCRIPTION

This program will obtain the NUV and FUV spectrum of the optical transient discovered in the dwarf galaxy UGC2773. Although it was discovered in 2009, the transient had faded very slowly and shows signs of shock interaction in the recent optical spectrum. The purpose of the UV spectra is to determine if the UV sows clear signs of shock excitation or line blanketing from a cool wind. The program will use STIS NUV and FUV MASA detectors with the 230L and 140L elements.

Visit

Proposal 14768, NUV (01) Fri Jul 29 19:33:25 GMT 2016

Diagnostic Status: Warning

Scientific Instruments: STIS/NUV-MAMA, STIS/CCD, STIS/FUV-MAMA

Special Requirements: BEFORE 01-MAY-2017:00:00:00

Comments: 2 orbits, low resolution spectrum.

Long-lived transient, but fading. Need to schedule observations as early as possible.

Diagnostics

(Exposure 2 (NUV (01))) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Exposure 3 (NUV (01))) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Exposure 4 (NUV (01))) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Exposure 5 (NUV (01))) Warning (Form): Sensitive exposures should have an ETC run number provided.

Fixed Targets

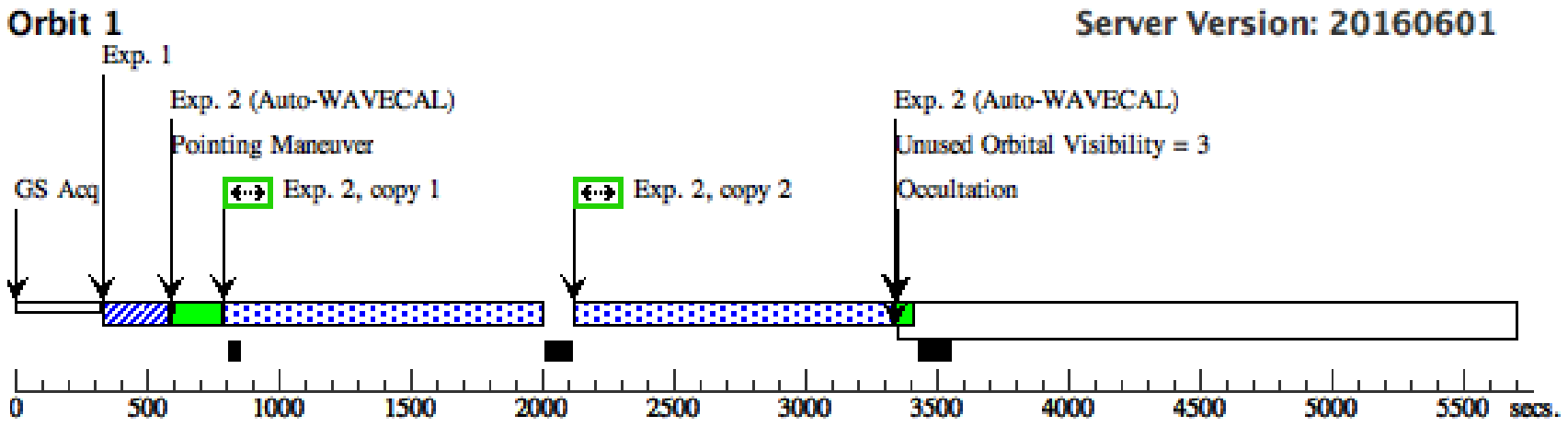
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	UGC-2773-OT	RA: 03 32 7.2400 (53.0301667d) Dec: +47 47 39.60 (47.79433d) Equinox: J2000		V=18.5+/-0.5	Reference Frame: ICRS

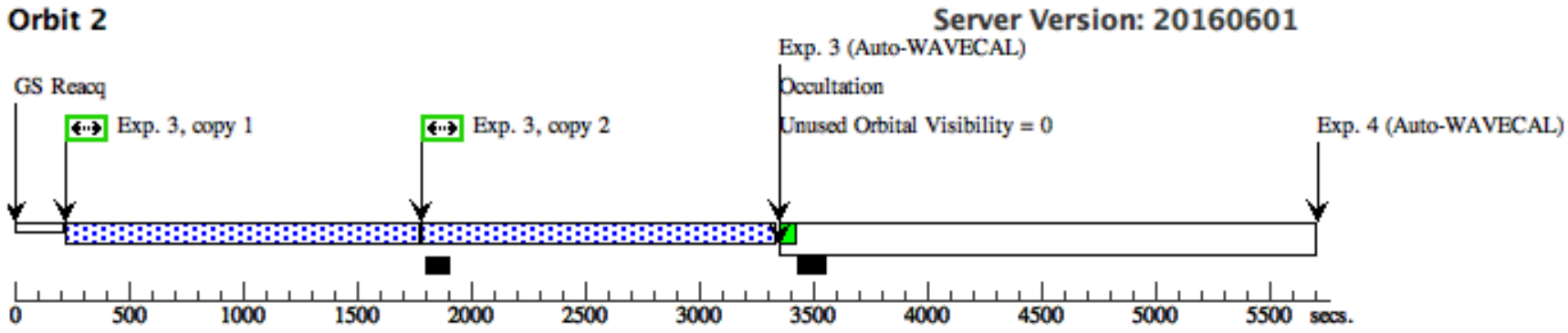
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Extended=NO

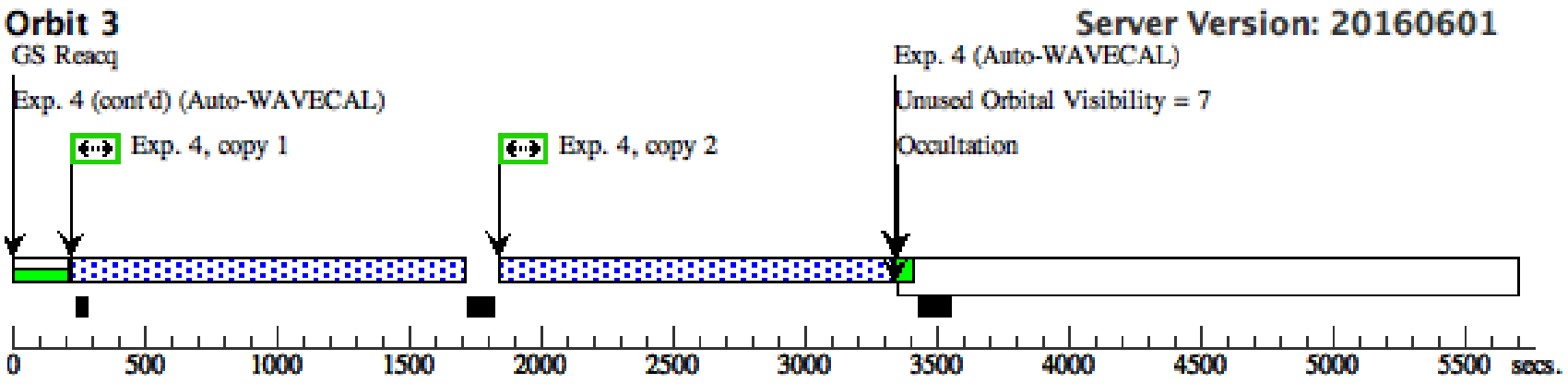
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ	(1) UGC-2773-OT	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			5 Secs (5 Secs) *[==>]*	***[1]***
2		(1) UGC-2773-OT	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				1196 Secs X 2 (2392 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
3		(1) UGC-2773-OT	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A				1540 Secs X 2 (3080 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[2]***
4		(1) UGC-2773-OT	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A				1480 Secs X 2 (2960 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[3]***
5		(1) UGC-2773-OT	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A				1540 Secs X 4 (6160 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]*	***[4]*** ***[5]***

Orbit Structure



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GS Reacq
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Exp. 4, copy 2
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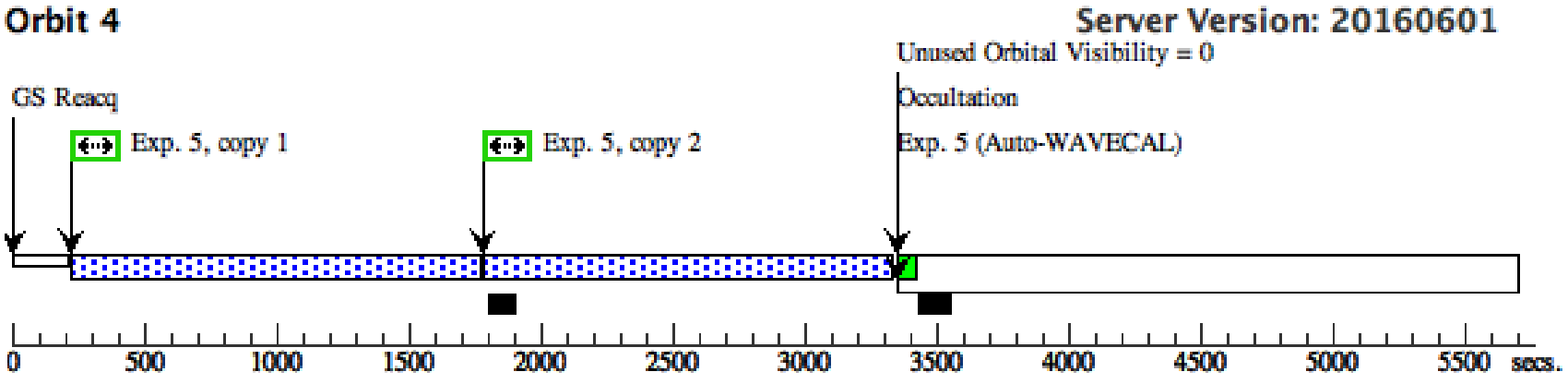
secs.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Exp. 5, copy 2
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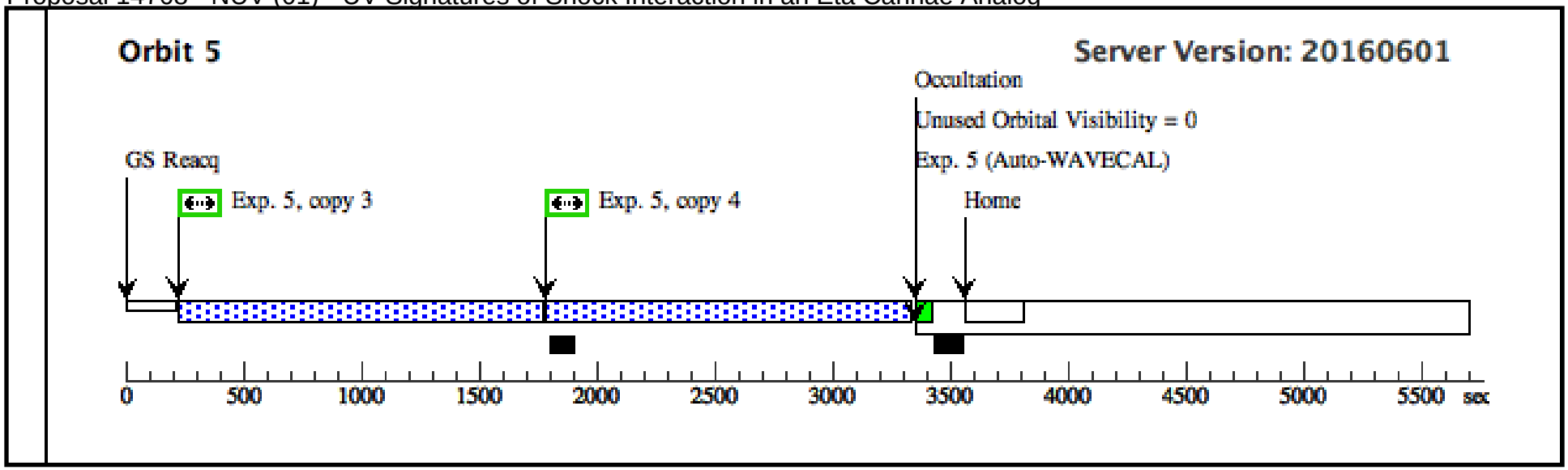
secs.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GS Reacq
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Exp. 5, copy 4
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