



15407 - NUV Monitoring of a SNIa with Late-Onset CSM Interaction

Cycle: 25, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

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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	(2) SDSSJ030910.69+273107.5 (3) PS15DPQ-AS-OFFSET	STIS/CCD STIS/NUV-MAMA	5	01-Nov-2017 20:00:15.0	yes

5 Total Orbits Used

ABSTRACT

We propose for Director's Discretionary Time to monitor the first-ever Type Ia supernova (SN Ia) found to be experiencing late-onset interaction between its ejecta and circumstellar material. Very few SNe Ia have been observed to interact with CSM, and always within a month or two of peak brightness, which indicates that their CSM was relatively nearby. Based on observations of time-varying and/or blueshifted sodium absorption, more distant CSM is predicted to exist in about 20% of all SN Ia systems, but has never been directly confirmed. This motivated our Cycle 24 Snapshot program to search for late-onset interaction in a sample of 80 nearby SNe Ia with NUV imaging at 1 to 3 years after explosion. In September 2017 we discovered PanSTARRS 15dpq to have a F275W apparent magnitude of 24.3 mag, ~2 years after its explosion. An optical spectrum in October 2017 showed a broad hydrogen emission line, confirming that the emission is associated with CSM interaction. At early-times, PS15dpq did not exhibit any sodium absorption or CSM interaction, making it the first and only example of SN Ia surrounded by a cleared-out inner volume and distant CSM. We propose for one epoch of STIS spectroscopy to constrain the NUV emission features (i.e., continuum- or line-emission), followed by six epochs of time-series NUV photometry to monitor the luminosity evolution. These data will allow us to place direct physical constraints on the amount and distribution of the CSM surrounding PS15dpq and will provide unique insight into the diversity of SN Ia progenitor systems, which is important because they are commonly used as standardizable candles for dark-energy cosmology.

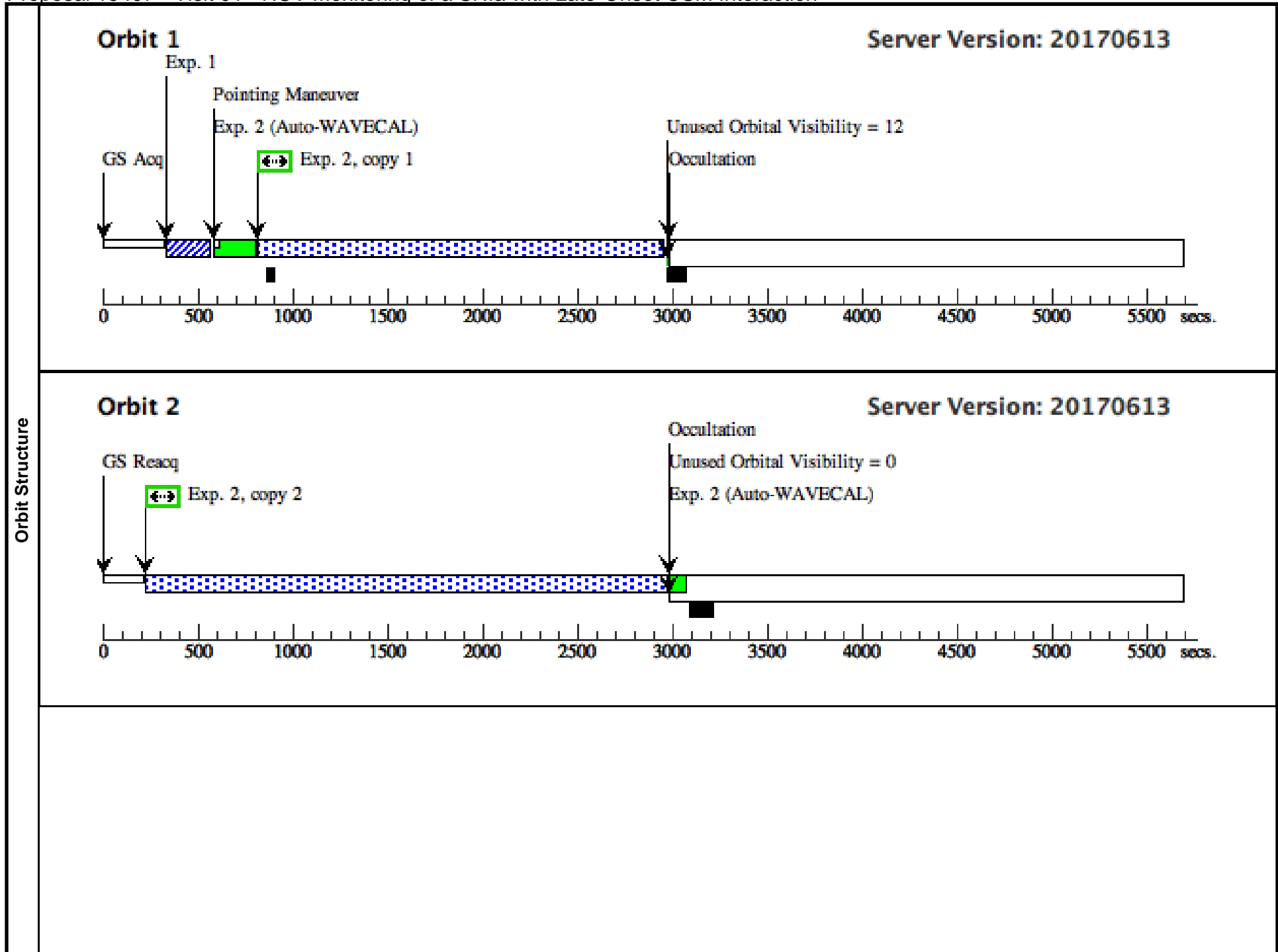
OBSERVING DESCRIPTION

A single visit, 5 orbit STIS spectrum of our target with the NUV-MAMA detector and the G230L grating.

Proposal 15407 - Visit 01 - NUV Monitoring of a SNIa with Late-Onset CSM Interaction

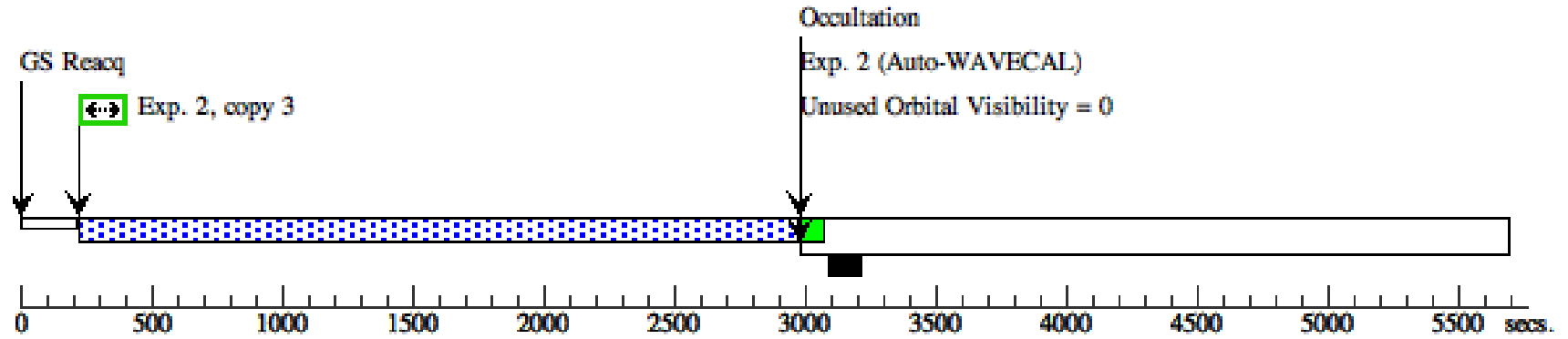
Thu Nov 02 00:00:16 GMT 2017

Visit	Proposal 15407, Visit 01, implementation Diagnostic Status: No Diagnostics Scientific Instruments: STIS/NUV-MAMA, STIS/CCD Special Requirements: PCS MODE FINE; SCHED 100%; BETWEEN 03-NOV-2017:00:00:00 AND 30-NOV-2017:00:00:00; ON HOLD ; TOO RESPONSE TIME 21.0D <i>On Hold Comments: Would like to execute as soon as possible.</i>									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
(2)		SDSSJ030910.69+273107.5	RA: 03 09 10.6880 (47.2945333d) Dec: +27 31 7.45 (27.51874d) Equinox: J2000		V=(?) F275W 20.0 mag	Reference Frame: ICRS				
(3)		PS15DPQ-AS-OFFSET	Offset from SDSSJ030910.69+273107.5 RA Offset: 2.05 Secs Dec Offset: 9.3528 Arcsec		V=35 F275W 24.3 mag on 2017-09-12	Offset Position (PS15DPQ-AS-OFFSET)				
<i>Comments: Same as target PS15DPO, but with location defined in reference to star SDSSJ03...</i>										
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	Acquisition (STIS.ta.103 2677)	(2) SDSSJ030910.69 +273107.5	STIS/CCD, ACQ, F28X50LP	MIRROR				2 Secs (2 Secs) [==>]	[1]
	<i>Comments: We are not entirely sure of this star's spectral type. I've used Pickles F2 since it appears quite blue. In our HST image it is F275W 20 mag, and in the SDSS photometry it has a ugriz of 17.0/15.2/14.3/16.4/13.7 mag.</i>									
	2	Science (STIS.sp.10 32629)	(3) PS15DPQ-AS-OFFSET	STIS/NUV-MAMA, ACCUM, 52X0.5	G230L 2376 A				2720 Secs X 5 (12991 Secs) [==>2108.0 Secs (Copy 1)] [==>2738.0 Secs (Copy 2)] [==>2715.0 Secs (Copy 3)] [==>2715.0 Secs (Copy 4)] [==>2715.0 Secs (Copy 5)]	[1] [2] [3] [4] [5]
	<i>Comments: The object is PS15DPO-OFFSET, whose coordinates are defined as offsets from star SDSSJ0...</i>									



Orbit 3

Server Version: 20170613



Orbit 4

Server Version: 20170613

