15691 - The Progenitor of Supernova 2017ein

Cycle: 26, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Charles Kilpatrick (PI) (Contact)	**University of California - Santa Cruz**	**cdkilpat@ucsc.edu**
Prof. Ryan Foley (CoI)	University of California - Santa Cruz	foley@ucsc.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) SN2017EIN	WFC3/UVIS	2	13-Nov-2019 15:00:26.0	yes
H1	(1) SN2017EIN	WFC3/UVIS	2	13-Nov-2019 15:00:28.0	yes

4 Total Orbits Used

ABSTRACT

Supernova (SN) 2017ein is the first Type Ic supernova with a credible progenitor candidate. This unprecedented discovery has the potential to revolutionize the study of core-collapse SNe by directly tying a stripped-envelope SN to a progenitor system with well-measured properties. However, follow up is necessary to robustly test the association between SN 2017ein and its progenitor candidate. We propose to revisit the site of SN 2017ein with HST once the SN has faded below the pre-explosion brightness. This observation will provide an unambiguous test of the association between the SN and progenitor candidate and better characterization of its pre-explosion properties. These images will also have archival value by provide an additional epoch of optical imaging covering the host galaxy NGC 3938.

OBSERVING DESCRIPTION

We propose to observe the site of supernova 2017ein in cycle 26 with the Wide Field Camera 3 (WFC3) UV/visible (UVIS) detecting CCD in F555W and F814W. The filters were chosen to match pre-explosion imaging of the site of this supernova where a counterpart was detected in WFPC2 F555W and F814W imaging from 2005. Based on light curves of the supernova from 2017 and 2018, we expect the source to be 26 mag in F555W and F814W, which is fainter than the pre-explosion magnitudes of the counterpart. Due to the fact that the supernova is still fading, we would prefer a later execution date so that it is as faint as possible in the proposed imaging. Taking into account the visibility window per orbit and the time needed for guide star acquisition, dithering, and exposure overheads, the total effective exposure time per orbit is 2500 s. We would therefore expect to detect any source at the location of supernova 2017ein with S/N > 20 in F555W and > 10 in F814W.

Visit

Proposal 15691, Visit 01, failed

Wed Nov 13 20:00:28 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1), (2)

Fixed Targets

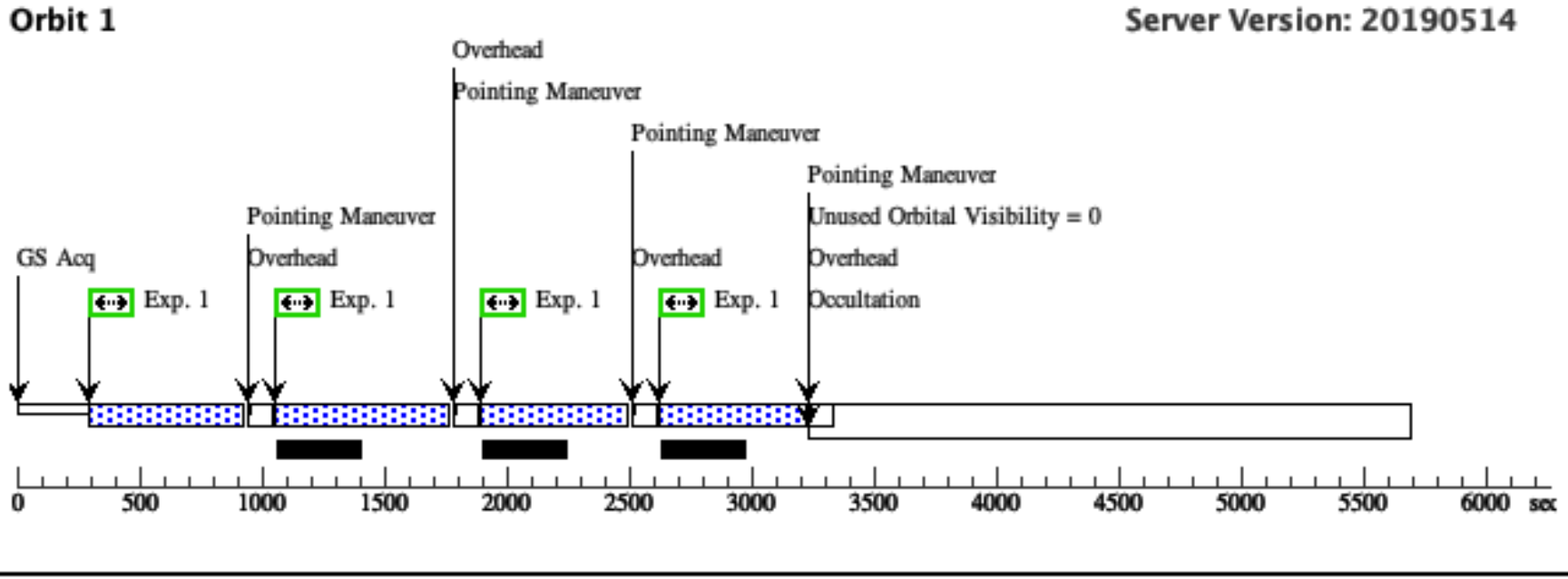
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN2017EIN	RA: 11 52 53.2500 (178.2218750d) Dec: +44 07 26.20 (44.12394d) Equinox: J2000		V=26	Reference Frame: ICRS

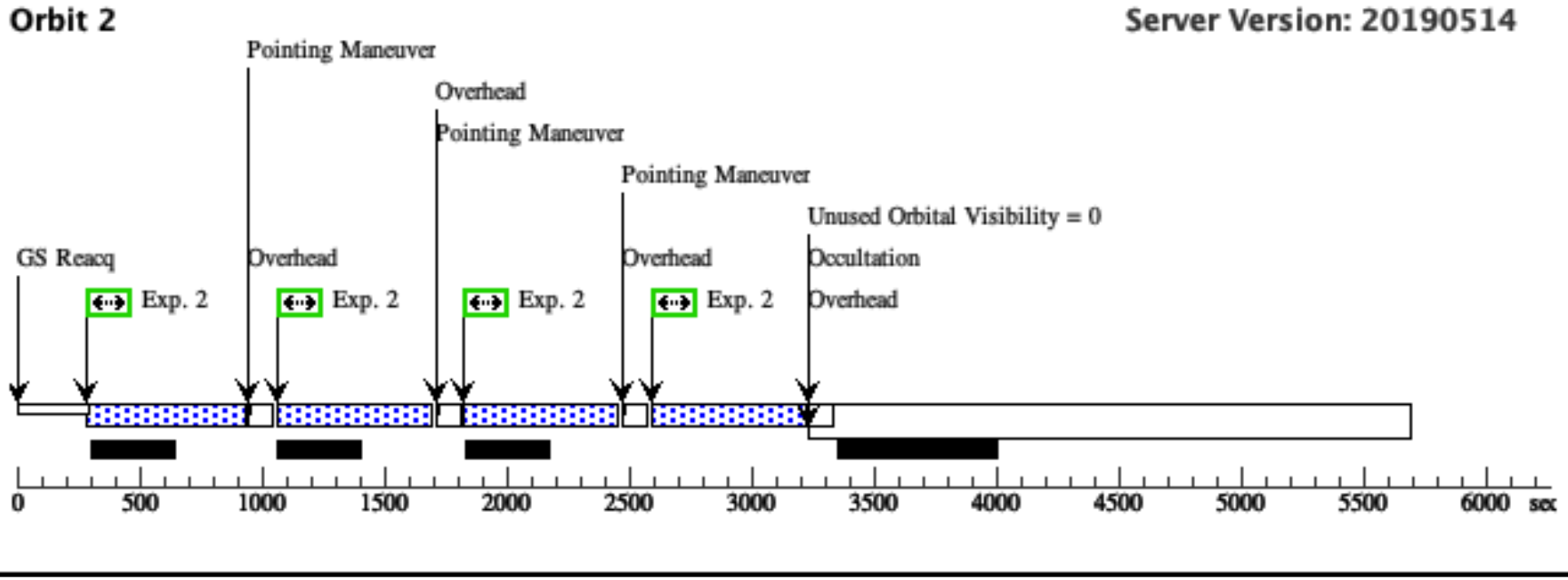
Comments:
Category=EXT-STAR
Description=[SUPERNOVA]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Exposure 1	(1) SN2017EIN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F555W			Pattern 1, Exps 1-1 in Visit 01 (1)	600 Secs (2513 Secs) *[==>(Pattern 1)]* *[==>713.0 Secs (Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2	Exposure 2	(1) SN2017EIN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F814W			Pattern 1, Exps 2-2 in Visit 01 (1)	600 Secs (2544 Secs) *[==>636.0 Secs (Pattern 1)]* *[==>636.0 Secs (Pattern 2)]* *[==>636.0 Secs (Pattern 3)]* *[==>636.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 15691, HOPR of failed visit 01 (H1), implementation Wed Nov 13 20:00:29 GMT 2019

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN2017EIN	RA: 11 52 53.2500 (178.2218750d) Dec: +44 07 26.20 (44.12394d) Equinox: J2000		V=26	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Exposure 1	(1) SN2017EIN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F555W			Pattern 1, Exps 1-1 in HOPR of failed visit 01 (H1) (1)	600 Secs (2513 Secs) *[==>(Pattern 1)]* *[==>713.0 Secs (Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2	Exposure 2	(1) SN2017EIN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F814W			Pattern 1, Exps 2-2 in HOPR of failed visit 01 (H1) (1)	600 Secs (2544 Secs) *[==>636.0 Secs (Pattern 1)]* *[==>636.0 Secs (Pattern 2)]* *[==>636.0 Secs (Pattern 3)]* *[==>636.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure