



15496 - Constraining the Late-Time Light Curve Behavior of Three Diverse Superluminous Supernovae

Cycle: 26, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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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	(1) PS16AQV	ACS/WFC	1	07-Dec-2018 17:01:10.0	yes
02	(2) PS16FGT	ACS/WFC	1	07-Dec-2018 17:01:11.0	yes
03	(3) GAIA16APD	ACS/WFC	1	07-Dec-2018 17:01:11.0	yes

3 Total Orbits Used

ABSTRACT

The current generation of untargeted optical time-domain surveys have led to the discovery of rare and extreme transients such as superluminous supernovae (SLSNe). The mechanism that powers the hydrogen-poor Type I SLSNe remains elusive, though models such as a magnetar central engine and interaction with a hydrogen-poor circumstellar medium are both major contenders. One of the most promising observational methods available to test these models is to track the light curve evolution to very late times where model predictions diverge. We propose to obtain ACS/WFC imaging of three Type I SLSNe (PS16aqv, PS16fgt, and Gaia16apd) at greater than 500 rest-frame days after peak brightness when only

HST provides the required sensitivity. These events span the diversity of decline timescales and colors exhibited by Type I SLSNe and will allow us to compare the late-time evolution of a diverse sample of events among themselves and with model predictions. These HST observation will be the latest ever of Type I SLSNe and will help to address important questions regarding their power source and diversity.

OBSERVING DESCRIPTION

In Cycle 25 we will use 6 orbits to observe three superluminous supernovae (PS16aqv, PS16fgt, and Gaia16apd) using ACS/WFC. We will obtain 2 orbits for each object, separated by at least a few months, to measure the late-time lightcurve decline rate. In Cycle 26 we will obtain 3 additional orbits (1 orbit per object) to measure the host galaxy flux.

Proposal 15496 - Visit 01 - Constraining the Late-Time Light Curve Behavior of Three Diverse Superluminous Supernovae

Fri Dec 07 22:01:12 GMT 2018

Visit	Proposal 15496, Visit 01, implementation					Fri Dec 07 22:01:12 GMT 2018				
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: ACS/WFC									
	Special Requirements: (none)									
Comments: Template for PS16aqv										
Patterns	#	Primary Pattern			Secondary Pattern		Exposures			
	(1)	Pattern Type=ACS-WFC-DITHER-BOX Coordinate Frame=POS-TARG Pattern Orientation=18.39 Purpose=DITHER Angle Between Sides=68.14 Number Of Points=4 Center Pattern=false Point Spacing=0.262 Line Spacing=0.192					(1)			
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	PS16AQV	RA: 14 10 44.5500 (212.6856250d) Dec: -10 09 35.40 (-10.15983d) Equinox: J2000	Redshift: 0.20	V=22.8	Reference Frame: ICRS				
Comments: Category=STAR Description=[SUPERNOVA]										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) PS16AQV	ACS/WFC, ACCUM, WFC1	F775W			Pattern 1, Exps 1-1 in Visit 01 (1)	530 Secs (2120 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)]	[1]
Orbit Structure	Orbit 1									
	Server Version: 20181130									

Proposal 15496 - Visit 02 - Constraining the Late-Time Light Curve Behavior of Three Diverse Superluminous Supernovae

Visit	Proposal 15496, Visit 02, implementation										Fri Dec 07 22:01:12 GMT 2018
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: ACS/WFC										
	Special Requirements: ORIENT 285D TO 310 D; ORIENT 10D TO 80 D; ORIENT 100D TO 170 D; ORIENT 190D TO 265 D; BETWEEN 01-FEB-2019:00:00:00 AND 15-JUL-2019:00:00:00										
Comments: Template for PS16fgt											
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(1)	Pattern Type=ACS-WFC-DITHER-BOX Coordinate Frame=POS-TARG Pattern Orientation=18.39 Purpose=DITHER Angle Between Sides=68.14 Number Of Points=4 Center Pattern=false Point Spacing=0.262 Line Spacing=0.192								(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(2)	PS16FGT	RA: 02 44 25.8200 (41.1075833d) Dec: +19 10 42.60 (19.17850d) Equinox: J2000		Redshift: 0.30		V=25		Reference Frame: ICRS		
	Comments: Category=STAR Description=[SUPERNOVA]										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(2) PS16FGT	ACS/WFC, ACCUM, WFC1	F625W			Pattern 1, Exps 1-1 i n Visit 02 (1)	532 Secs (2128 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)]		[1]
Orbit Structure	Orbit 1 Server Version: 20181130 GS Acq Exp. 1 Pointing Maneuver Exp. 1 Pointing Maneuver Exp. 1 Pointing Maneuver Exp. 1 Unused Orbital Visibility = 1 Occultation 0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 sec										

Proposal 15496 - Visit 03 - Constraining the Late-Time Light Curve Behavior of Three Diverse Superluminous Supernovae

Fri Dec 07 22:01:12 GMT 2018

Visit	Proposal 15496, Visit 03, implementation											
	Diagnostic Status: No Diagnostics											
	Scientific Instruments: ACS/WFC											
	Special Requirements: BETWEEN 15-JAN-2019:00:00:00 AND 15-JUN-2019:00:00:00											
Comments: Template for Gaia16apd												
Patterns	#	Primary Pattern				Secondary Pattern				Exposures		
	(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.262 Line Spacing=0.192				Coordinate Frame=POS-TARG Pattern Orientation=18.39 Angle Between Sides=68.14 Center Pattern=false				(1)		
Fixed Targets	#	Name		Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(3)	GAIA16APD		RA: 12 02 51.7100 (180.7154583d) Dec: +44 15 27.40 (44.25761d) Equinox: J2000		Redshift: 0.10		V=21.7		Reference Frame: ICRS		
Comments: Category=STAR Description=[SUPERNOVA]												
Exposures	#	Label	Target	Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		
	1		(3) GAIA16APD	ACS/WFC, ACCUM, WFC1		F625W			Pattern 1, Exps 1-1 in Visit 03 (1)	545 Secs (2180 Secs)		
										[=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)]		[1]
Orbit Structure	Orbit 1											
	Server Version: 20181130											