



11546 - Ultra-Luminous Red Novae or Mergebursts? A Definitive HST Test

Cycle: 16, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. Michael Shara (PI)	American Museum of Natural History	mshara@amnh.org
Dr. David R. Zurek (CoI)	American Museum of Natural History	dzurek@amnh.org
Dr. Dina Prialnik (CoI)	Tel Aviv University - Wise Observatory	dina@planet.tau.ac.il
Dr. Ofer Yaron (CoI)	Tel Aviv University - Wise Observatory	oferya@post.tau.ac.il

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) M31-RV	WFPC2	4	04-Jun-2008 21:09:03.0	yes
02	(1) M31-RV	ACS/SBC	1	04-Jun-2008 21:09:10.0	yes

5 Total Orbits Used

ABSTRACT

V838 Mon and M31-RV are extraordinarily luminous (10^{*6} Lsun) and cool (~1000 K) eruptive variables. Their red colors and cool spectra have prompted claims that these objects are not classical novae, but instead represent a new class of astrophysical object: "MERGEBURSTS".

Mergebursts are (hypothetical) mergers of close binary stars, predicted to rival the brightest classical novae in luminosity, but to always be much cooler and redder than novae. This prediction allows a definitive test of the mergeburst hypothesis for M31-RV as follows.

We have found a very bright, BLUE object within 0.4 arcsec of M31-RV in 10-year old archival WFPC2 images...consistent with an old nova, and

not a mergeburst. We propose new ACS/SBC UV and WFPC2 visible images that will definitively show if this object is still as hot as nova theory predicts ($>100,000$ Kelvin), and if it is fading like an old nova. This would eliminate the strongest candidate for a mergeburst.

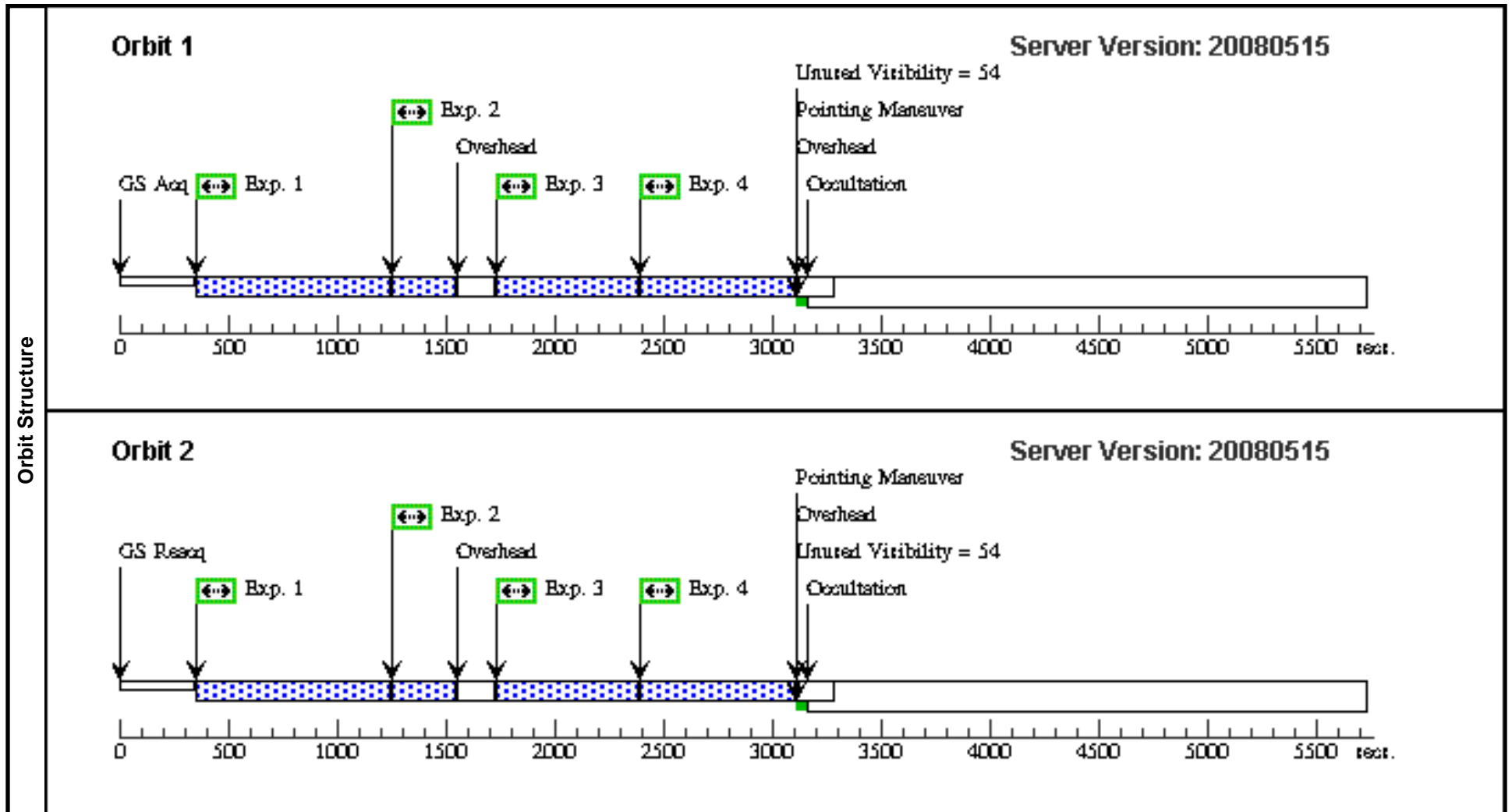
OBSERVING DESCRIPTION

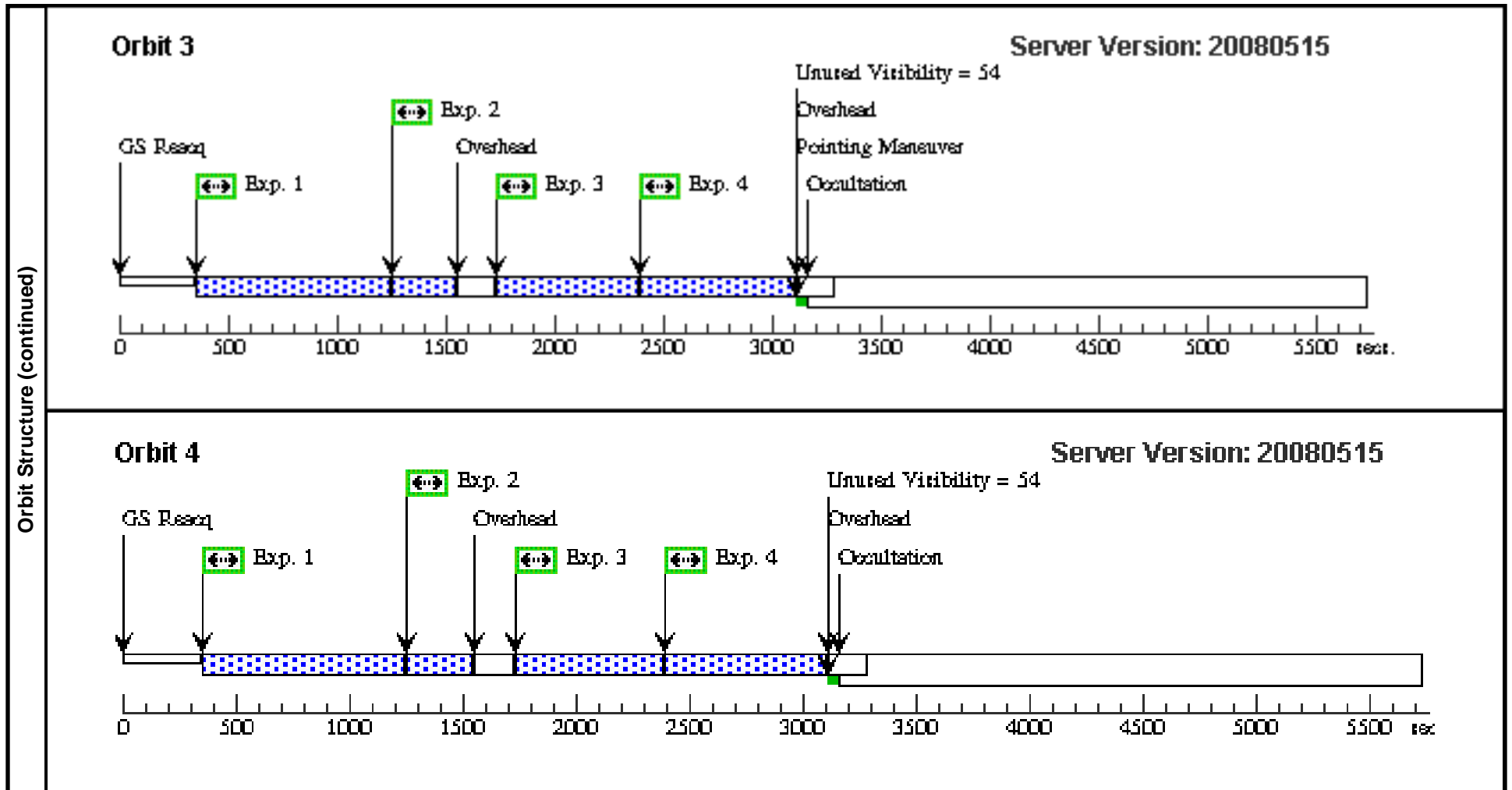
We will use the ACS/SBC with the F140LP filter for one orbit to image the Far Ultraviolet flux of the source(s) at the position of the M31-RV. We will also image the position of M31-RV with WFPC2 for a total of 4 orbits. We will use F300W (4x600 seconds), F439W (4x400 seconds), F555W (4x200 seconds) and F814W (4x600 seconds). These observations will be deep enough to detect M31-RV if it is a very blue (nova) remnant, or a very red mergeburst.

Proposal 11546 - Visit 01 - Ultra-Luminous Red Novae or Mergebursts? A Definitive HST Test

Thu Jun 05 01:09:12 GMT 2008

Visit	Proposal 11546, Visit 01, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(1)	Pattern Type=WFPC2-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.559017 Line Spacing=0.559017	Coordinate Frame=POS-TARG Pattern Orientation=26.56505 Angle Between Sides=143.130102 Center Pattern=false		(1-4)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	M31-RV	RA: 00 43 2.4330 (10.7601375d) Dec: +41 12 56.17 (41.21560d) Equinox: J2000		V=23.2	Reference Frame: WFPC2				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) M31-RV	WFPC2, IMAGE, PC1-FIX	F814W			Pattern 1-4 (1)	500 Secs	
									[=>600.0 Secs (Pattern 1)]	[1]
									[=>600.0 Secs (Pattern 2)]	[2]
									[=>600.0 Secs (Pattern 3)]	[3]
									[=>600.0 Secs (Pattern 4)]	[4]
	2		(1) M31-RV	WFPC2, IMAGE, PC1-FIX	F555W			Pattern 1-4 (1)	600 Secs	
									[=>200.0 Secs (Pattern 1)]	[1]
									[=>200.0 Secs (Pattern 2)]	[2]
									[=>200.0 Secs (Pattern 3)]	[3]
									[=>200.0 Secs (Pattern 4)]	[4]
	3		(1) M31-RV	WFPC2, IMAGE, PC1-FIX	F439W			Pattern 1-4 (1)	600 Secs	
									[=>400.0 Secs (Pattern 1)]	[1]
									[=>400.0 Secs (Pattern 2)]	[2]
									[=>400.0 Secs (Pattern 3)]	[3]
									[=>400.0 Secs (Pattern 4)]	[4]
	4		(1) M31-RV	WFPC2, IMAGE, PC1-FIX	F300W			Pattern 1-4 (1)	600 Secs	
								[=>600.0 Secs (Pattern 1)]	[1]	
								[=>600.0 Secs (Pattern 2)]	[2]	
								[=>600.0 Secs (Pattern 3)]	[3]	
								[=>600.0 Secs (Pattern 4)]	[4]	





Proposal 11546 - Visit 02 - Ultra-Luminous Red Novae or Mergebursts? A Definitive HST Test

Thu Jun 05 01:09:14 GMT 2008

Visit	Proposal 11546, Visit 02, implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: PCS MODE FINE; GYRO MODE 2G									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
(2)		Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false					(1)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	M31-RV	RA: 00 43 2.4330 (10.7601375d) Dec: +41 12 56.17 (41.21560d) Equinox: J2000		V=23.2	Reference Frame: WFPC2				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) M31-RV	ACS/SBC, ACCUM, SBC	F140LP			Pattern 1-1 (2)	638 Secs [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)]	[1]

