13428 - Characterizing the Ultra-cold Brown Dwarf WD 0806-661B

Cycle: 21, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Christopher R. Gelino (PI) (Contact)	**Jet Propulsion Laboratory**	**cgelino@ipac.caltech.edu**
Dr. Charles A. Beichman (CoI)	Jet Propulsion Laboratory	chas@pop.jpl.nasa.gov
Dr. J. Davy Kirkpatrick (CoI)	California Institute of Technology	davy@ipac.caltech.edu
Prof. Edward L. Wright (CoI)	University of California - Los Angeles	wright@astro.ucla.edu
Dr. Michael C. Cushing (CoI)	University of Toledo	michael.cushing@utoledo.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) WD-0806-661B	WFC3/IR	3	11-Jul-2013 19:54:37.0	yes
02	(1) WD-0806-661B	WFC3/IR	1	11-Jul-2013 19:54:45.0	yes
03	(1) WD-0806-661B	WFC3/IR	1	11-Jul-2013 19:54:49.0	yes
04	(1) WD-0806-661B	WFC3/IR	2	11-Jul-2013 19:54:56.0	yes

7 Total Orbits Used

ABSTRACT

WD 0806-661B, a common proper motion companion to a white dwarf, was discovered by multi-epoch Spitzer observations. The IRAC colors and absolute magnitudes indicate that it is a brown dwarf approximately as cold as the >=Y2 dwarf WISE 1828+2650, the coldest spectroscopically confirmed brown dwarf (Teff ~300K). WD 0806-661B is too faint for spectroscopy, so we propose to characterize this object with multi-wavelength WFC3/IR observations. The photometry will not only allow us to characterize WD 0806-661B as a cold brown dwarf, it will also provide insight

into the rapidly changing J-ch2, J-H, and Y-J colors exhibited by the Y dwarfs. The observations will also help bridge the gap between "normal" Y dwarfs and the enigmatic WISE 1828+2650.

OBSERVING DESCRIPTION

Over 7 orbits, we will obtain observations of a single, faint point source in four WFC3/IR filters: F105W (3 orbits), F125W (1 orbit), F127M (1 orbit), and F160W (2 orbits). For each orbit, we will use the WFC3-IR-DITHER-LINE-3PT dither pattern to acquire three 1000 sec exposures (NSAMP=11, SAMP-SEQ=SPAR100). For the F160W and F105W visits, we will offset the 3-point dither pattern in the 2nd and 3rd orbits by 0.4725 arcsec with respect to the previous orbit, thereby creating 6- and 9-point dither patterns for F160W and F105W, respectively. No timing constraints have been applied to any visit in this program.

Visit

Proposal 13428, WD0806-661B-F105W (01) Thu Jul 11 23:55:03 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(1)	Pattern Type=LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.4725 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=0 Angle Between Sides= Center Pattern=false	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false	(1)

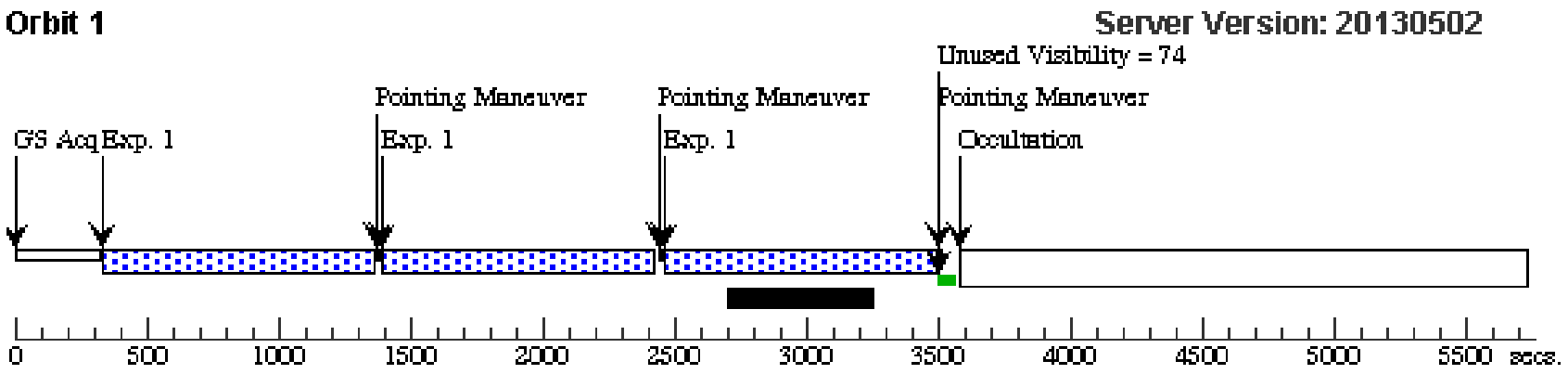
Fixed Targets

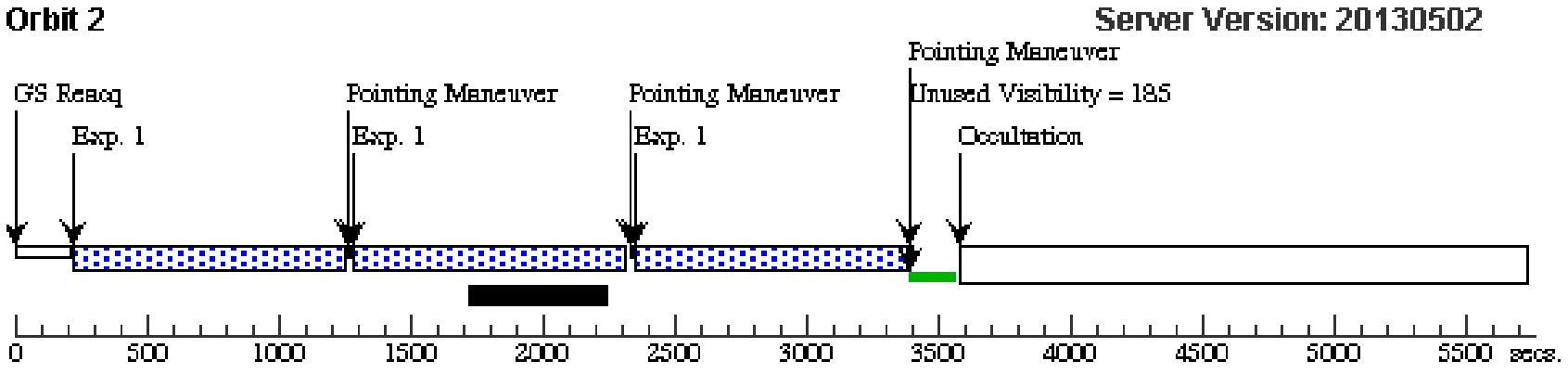
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WD-0806-661B	RA: 08 07 15.1900 (121.8132917d) Dec: -66 18 51.20 (-66.31422d) Equinox: J2000	Proper Motion RA: 340.3 mas/yr Proper Motion Dec: -289.6 mas/yr Parallax: 0.052" Epoch of Position: 2009.6	V=35	Reference Frame: ICRS

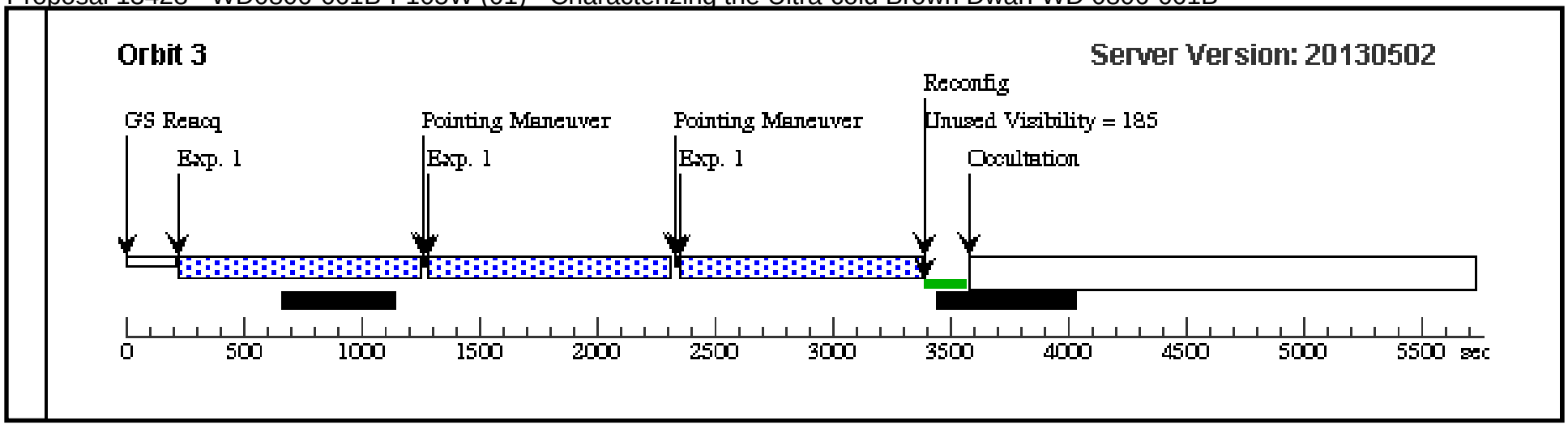
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) WD-0806-661B	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=11; SAMP-SEQ=SPARS100		Pattern 1, Exps 1-1 in WD0806-661B-F105W (01) (1)	1002.935521 Secs (9026.42 Secs)	
								[==>(Pattern 1,1)]	***[1]***
								[==>(Pattern 1,2)]	
								[==>(Pattern 1,3)]	
								[==>(Pattern 2,1)]	***[2]***
								[==>(Pattern 2,2)]	
								[==>(Pattern 2,3)]	
								[==>(Pattern 3,1)]	***[3]***
								[==>(Pattern 3,2)]	
								[==>(Pattern 3,3)]	

Orbit Structure






Orbit 3
Server Version: 20130502
GS Reacq
Exp. 1
Pointing Maneuver
Exp. 1
Pointing Maneuver
Exp. 1
Reconfig
Unused Visibility = 185
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13428, WD0806-661B-F125W (02) Thu Jul 11 23:55:06 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)

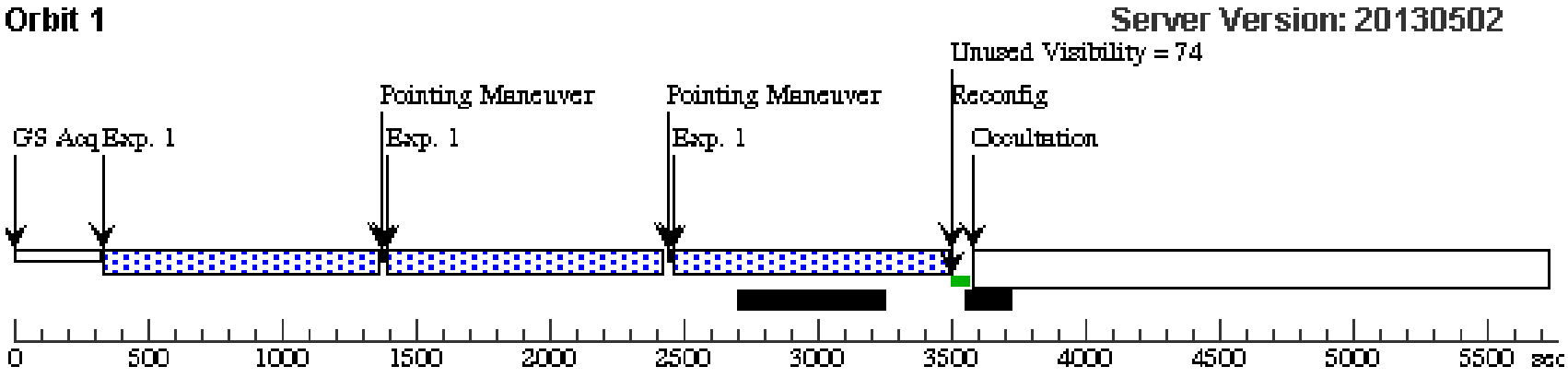
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WD-0806-661B	RA: 08 07 15.1900 (121.8132917d) Dec: -66 18 51.20 (-66.31422d) Equinox: J2000	Proper Motion RA: 340.3 mas/yr Proper Motion Dec: -289.6 mas/yr Parallax: 0.052" Epoch of Position: 2009.6	V=35	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) WD-0806-661B	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=11; SAMP-SEQ=SPARS100		Pattern 3, Exps 1-1 in WD0806-661B-F125W (02) (3)	1002.935521 Secs (3008.807 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	*[1]*

Orbit Structure



Visit

Proposal 13428, WD0806-661B-F127M (03) Thu Jul 11 23:55:06 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)

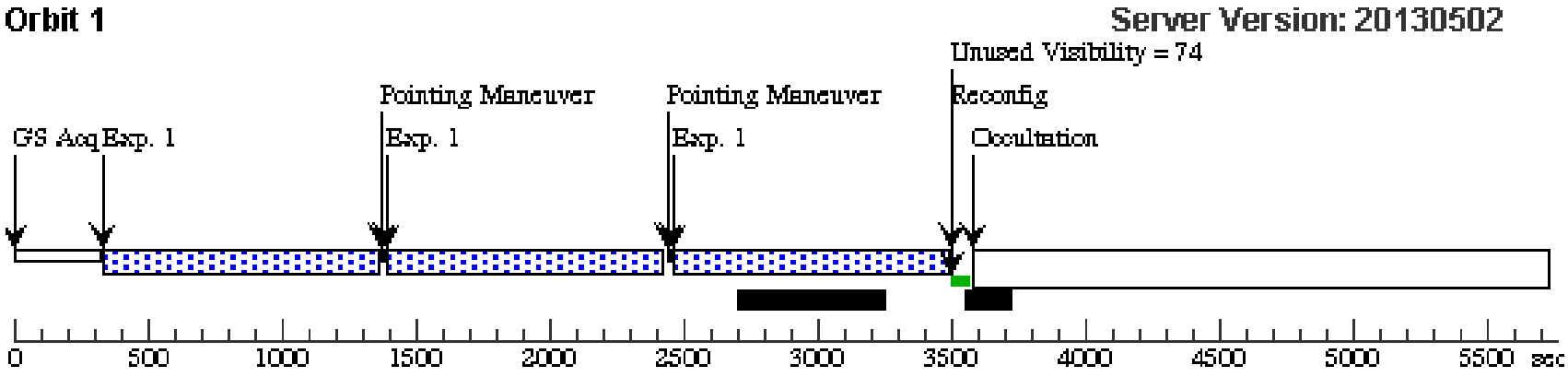
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WD-0806-661B	RA: 08 07 15.1900 (121.8132917d) Dec: -66 18 51.20 (-66.31422d) Equinox: J2000	Proper Motion RA: 340.3 mas/yr Proper Motion Dec: -289.6 mas/yr Parallax: 0.052" Epoch of Position: 2009.6	V=35	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) WD-0806-661B	WFC3/IR, MULTIACCUM, IR	F127M	NSAMP=11; SAMP-SEQ=SPARS100		Pattern 3, Exps 1-1 in WD0806-661B-F127M (03) (3)	1002.935521 Secs (3008.807 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	*[1]*

Orbit Structure



Visit

Proposal 13428, WD0806-661B-F160W (04) Thu Jul 11 23:55:07 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(2)	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.4725 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=0 Angle Between Sides= Center Pattern=false	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false	(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WD-0806-661B	RA: 08 07 15.1900 (121.8132917d) Dec: -66 18 51.20 (-66.31422d) Equinox: J2000	Proper Motion RA: 340.3 mas/yr Proper Motion Dec: -289.6 mas/yr Parallax: 0.052" Epoch of Position: 2009.6	V=35	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) WD-0806-661B	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=11; SAMP-SEQ=SPARS100		Pattern 2, Exps 1-1 in WD0806-661B-F160W (04) (2)	1002.935521 Secs (6017.613 Secs)	
								[==>(Pattern 1,1)] *[==>(Pattern 1,2)]* *[==>(Pattern 1,3)]*	***[1]***
								[==>(Pattern 2,1)] *[==>(Pattern 2,2)]* *[==>(Pattern 2,3)]*	***[2]***

Orbit Structure