



12225 - Imaging accretion sources and circumbinary disks in young brown dwarfs

Cycle: 18, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. Ansgar Reiners (PI) (ESA Member)	Universitaet Goettingen, Institut fuer Astrophysik	Ansgar.Reiners@phys.uni-goettingen.de
Dr. Paul Kalas (CoI) (AdminUSPI)	University of California - Berkeley	kalas@astron.berkeley.edu

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) 2MASSI-J0041353-562112	WFC3/UVIS	1	10-Jul-2010 00:55:36.0	yes
02	(2) 2MASSI-J0041353-562112	WFC3/UVIS	1	10-Jul-2010 00:55:42.0	yes
03	(1) NAME-2M1207A	WFC3/UVIS	1	10-Jul-2010 00:55:46.0	yes
04	(1) NAME-2M1207A	WFC3/UVIS	1	10-Jul-2010 00:55:51.0	yes
05	(1) NAME-2M1207A	WFC3/UVIS	1	10-Jul-2010 00:55:55.0	yes

5 Total Orbits Used

ABSTRACT

We propose to obtain deep WFC3/UVIS imaging observations of two accreting, nearby, young brown dwarf binaries. The first, 2M1207, is a brown dwarf with a planetary mass companion that became a benchmark in low-mass star formation and low-mass evolutionary models. The second, 2M0041, is a nearby young brown dwarf with clear evidence for accretion, but its space motion suggests a slightly higher age than the canonical accretion lifetime of 5-10 Myr. It has recently been discovered to be a binary and is likely to become a second benchmark object in this field. With narrow band images centered on the H α line that is indicative of accretion, we aim to determine the accretion ratio between the two components

in each system. H-alpha was observed in both systems but so far not spatially resolved. In particular, we want to search for accretion in the planetary mass companion of 2M1207. The evidence for accretion in 2M0041 and the possibility that it is in fact older than 10Myr suggests that the accretion lifetime is longer in brown dwarfs than in stars, and in particular that it is longer in brown dwarf binaries. Accretion could be sustained for a longer time if the accreting material is replenished by a circumbinary disk that might exist in both systems. We propose deep WFC/UVIS observations in the optical to search for circumbinary disks, similar to the famous disk around the binary TTauri system GG Tau.

OBSERVING DESCRIPTION

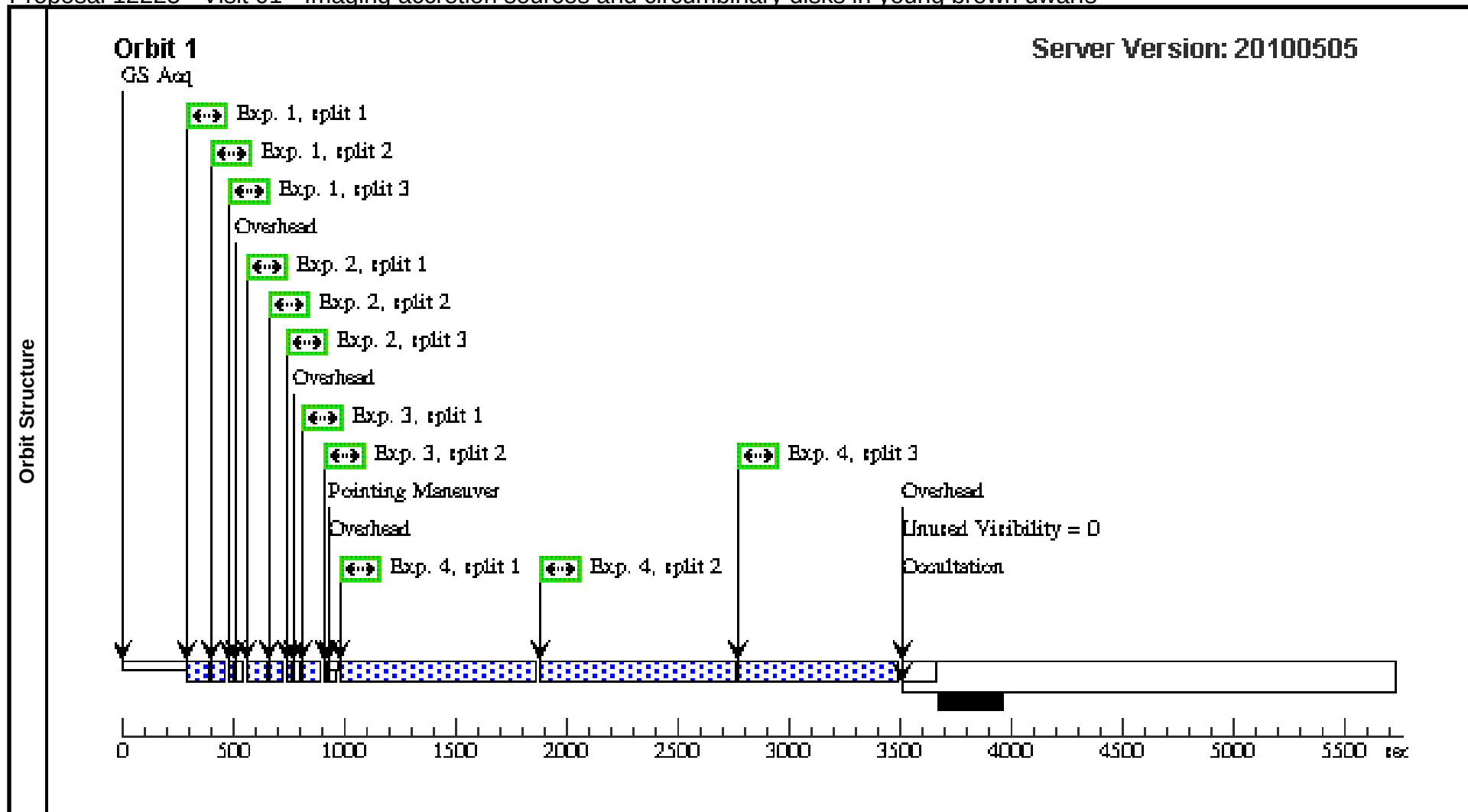
This program aims to detect H-alpha from young, low mass objects and produce a high-contrast image of the environment to detect circumstellar disks. To minimize buffer overheads, the H-alpha portion of the experiment uses a 512x512 subarray. The longer exposures for circumstellar material in optical scattered light utilize the F606W filter with a 2Kx2K subarray. For PSF subtraction, we use several rolls for each of the two sources (2M0041 and 2M1207).

ADDITIONAL COMMENTS

For optimal PSF subtraction, the orbits (for each of the two sources) should be consecutive orbits. We specify GROUP WITHIN and ORIENT FROM commands. The ORIENT FROM should be the maximum allowable (typically 30 degrees).

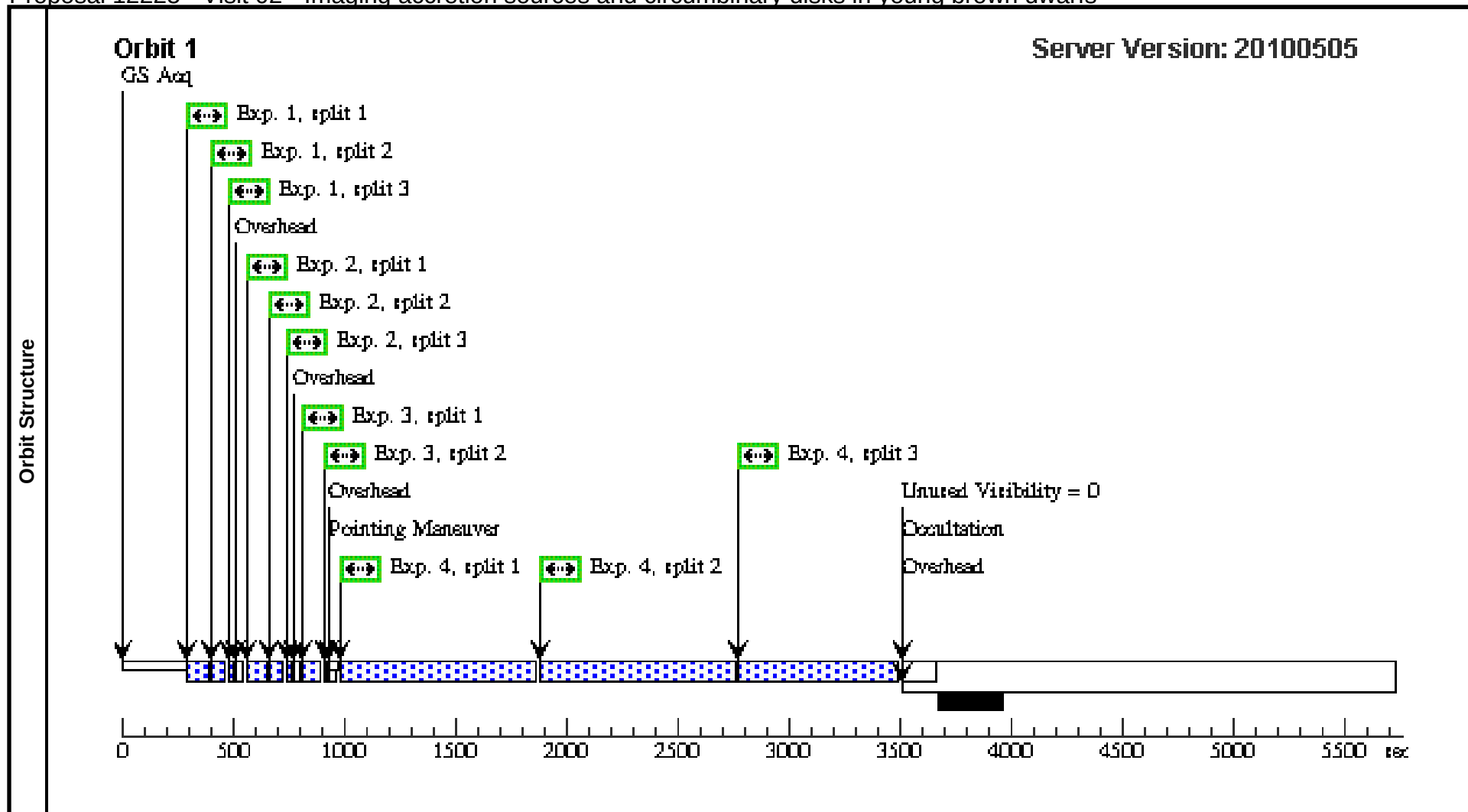
Proposal 12225 (STScI Edit Number: 0, Created: Friday, July 9, 2010 11:55:58 PM EST) - Overview

Visit	Proposal 12225, Visit 01, implementation								Sat Jul 10 04:55:59 GMT 2010	
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: GROUP 01,02 WITHIN 2 Orbits; SEQ 01,02 WITHIN 1 Orbits									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(2)	2MASSI-J0041353-562112	RA: 00 41 35.3900 (10.3974583d) Dec: -56 21 12.77 (-56.35355d) Equinox: J2000			V=18.0		Reference Frame: ICRS		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	2M0041 H-a lpha	(2) 2MASSI-J0041353-562112	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F656N	CR-SPLIT=3			60 Secs	
									[==>(Split 1)]	
									[==>(Split 2)]	
									[==>(Split 3)]	[1]
	2	2M0041 continuum	(2) 2MASSI-J0041353-562112	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F645N	CR-SPLIT=3			60 Secs	
									[==>(Split 1)]	
									[==>(Split 2)]	
									[==>(Split 3)]	[1]
	3	2M0041 F60 6W short	(2) 2MASSI-J0041353-562112	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F606W	CR-SPLIT=2			20 Secs	
								[==>(Split 1)]		
								[==>(Split 2)]	[1]	
4	2M0041 F60 6W long	(2) 2MASSI-J0041353-562112	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=3			2160 Secs		
								[==>(Split 1)]		
								[==>(Split 2)]		
								[==>(Split 3)]	[1]	



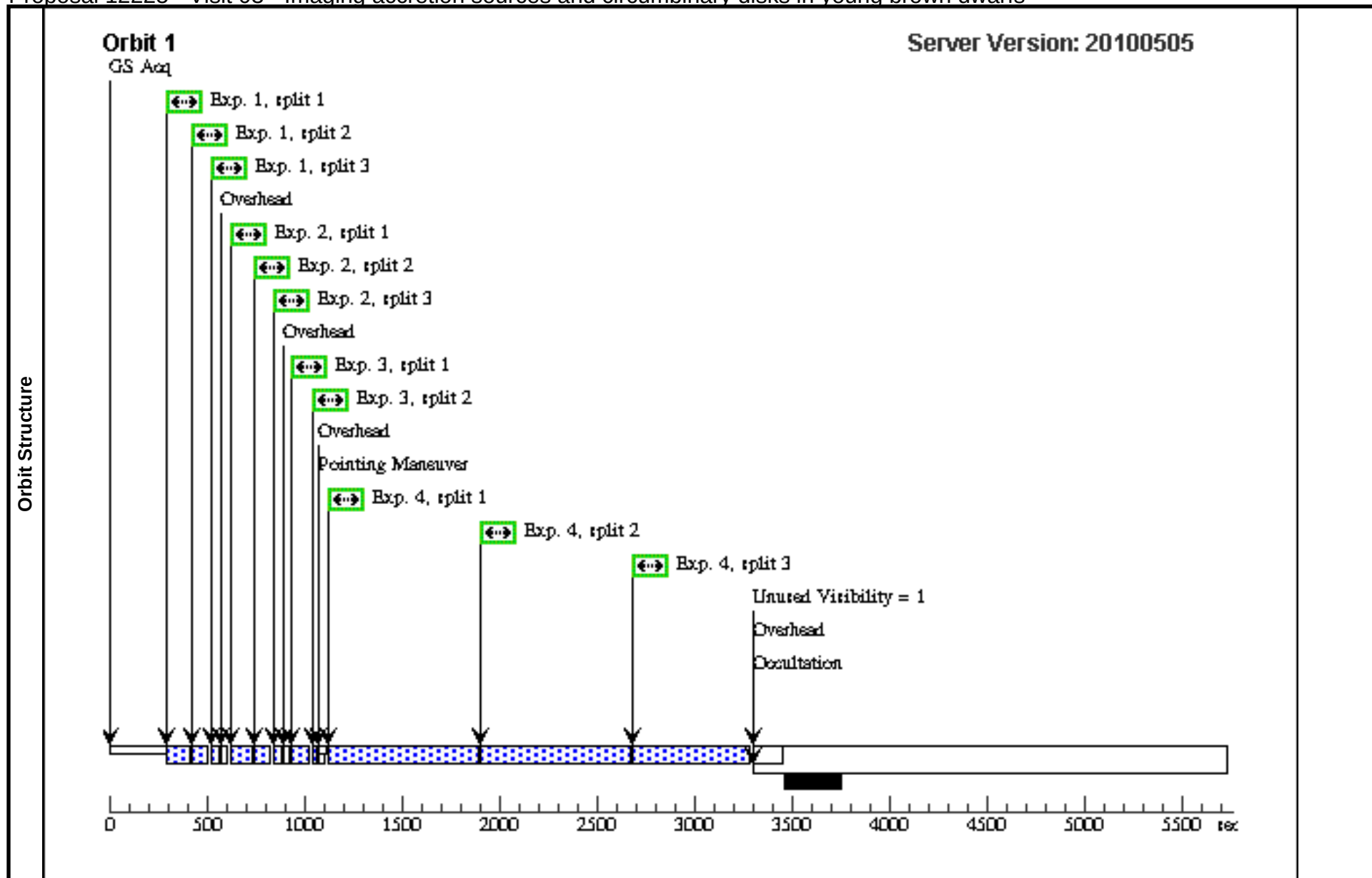
Proposal 12225 - Visit 01 - Imaging accretion sources and circumbinary disks in young brown dwarfs

Visit	Proposal 12225, Visit 02, implementation								Sat Jul 10 04:56:00 GMT 2010	
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: ORIENT 35D TO 37D FROM 01; SEQ 01,02 WITHIN 1 Orbits									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(2)	2MASSI-J0041353-562112	RA: 00 41 35.3900 (10.3974583d) Dec: -56 21 12.77 (-56.35355d) Equinox: J2000			V=18.0		Reference Frame: ICRS		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	2M0041 H-a lpha	(2) 2MASSI-J0041353-562112	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F656N	CR-SPLIT=3			60 Secs	
									[==>(Split 1)]	
									[==>(Split 2)]	
									[==>(Split 3)]	[1]
	2	2M0041 continuum	(2) 2MASSI-J0041353-562112	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F645N	CR-SPLIT=3			60 Secs	
									[==>(Split 1)]	
									[==>(Split 2)]	
									[==>(Split 3)]	[1]
	3	2M0041 F60 6W short	(2) 2MASSI-J0041353-562112	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F606W	CR-SPLIT=2			20 Secs	
									[==>(Split 1)]	
									[==>(Split 2)]	[1]
	4	2M0041 F60 6W long	(2) 2MASSI-J0041353-562112	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=3			2160 Secs	
									[==>(Split 1)]	
									[==>(Split 2)]	
									[==>(Split 3)]	[1]



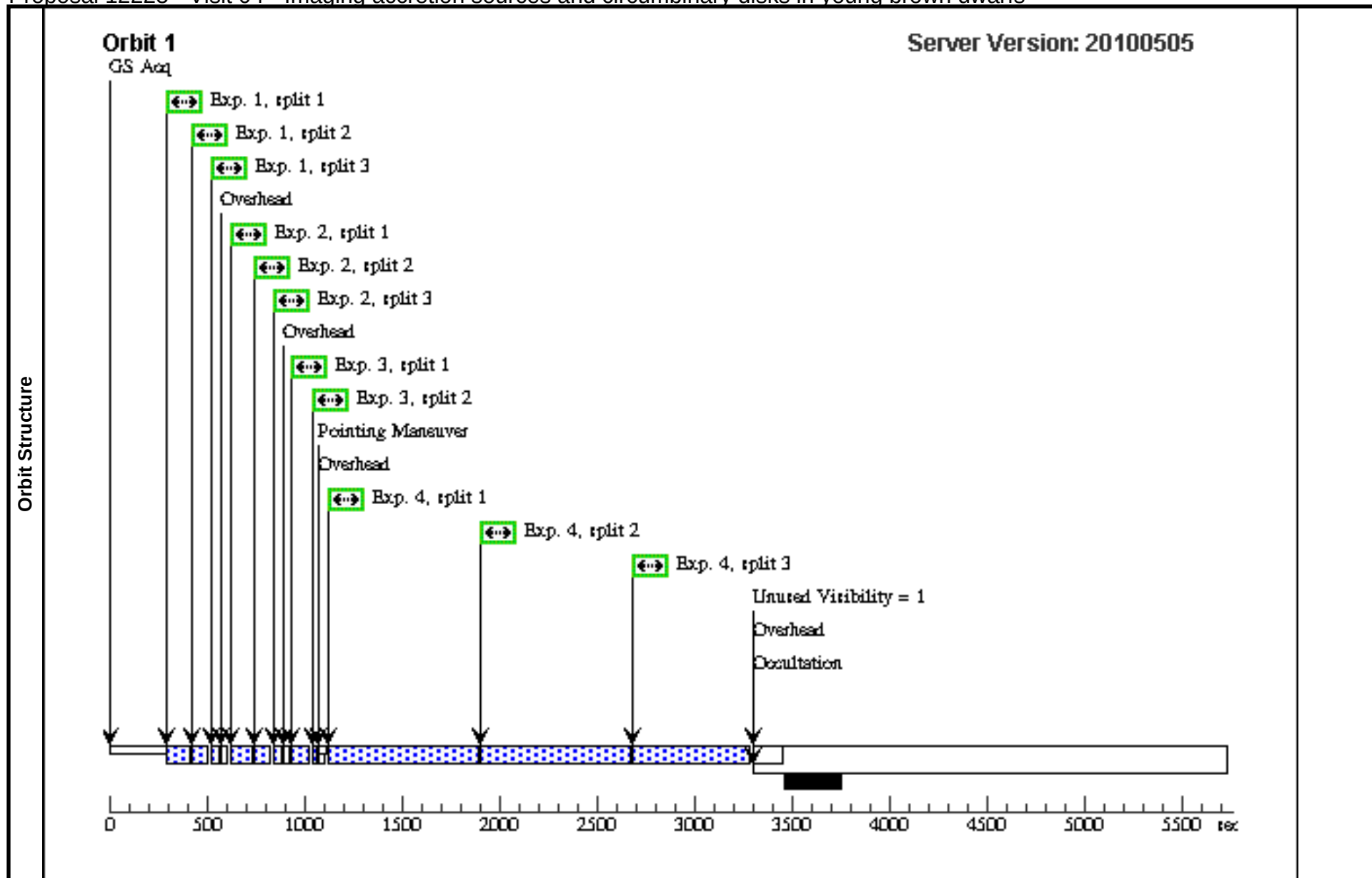
Proposal 12225 - Visit 02 - Imaging accretion sources and circumbinary disks in young brown dwarfs

Visit	Proposal 12225, Visit 03, implementation Sat Jul 10 04:56:00 GMT 2010									
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: GROUP 03,04,05 WITHIN 3 Orbits; SEQ 03,04,05 WITHIN 2 Orbits									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	NAME-2M1207A	RA: 12 07 33.4700 (181.8894583d) Dec: -39 32 54.00 (-39.54833d) Equinox: J2000 <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>		V=18.9	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	2M1207 H-a lpha	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F656N	CR-SPLIT=3			120 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)]	[1]
	2	2M1207 continuum	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F645N	CR-SPLIT=3			120 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)]	[1]
	3	2M1207 F60 6W short	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F606W	CR-SPLIT=2			40 Secs [==>(Split 1)] [==>(Split 2)]	[1]
	4	2M1207 F60 6W long	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=3			1809 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)]	[1]



Proposal 12225 - Visit 03 - Imaging accretion sources and circumbinary disks in young brown dwarfs

Visit	Proposal 12225, Visit 04, implementation Sat Jul 10 04:56:01 GMT 2010									
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 15D TO 15.1D FROM 03; SEQ 03,04,05 WITHIN 2 Orbits									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	NAME-2M1207A	RA: 12 07 33.4700 (181.8894583d) Dec: -39 32 54.00 (-39.54833d) Equinox: J2000 <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>		V=18.9	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	2M1207 H-a lpha	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F656N	CR-SPLIT=3			120 Secs	
									[==>(Split 1)]	
									[==>(Split 2)]	
									[==>(Split 3)]	[1]
	2	2M1207 continuum	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F645N	CR-SPLIT=3			120 Secs	
									[==>(Split 1)]	
									[==>(Split 2)]	
									[==>(Split 3)]	[1]
	3	2M1207 F60 6W short	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB	F606W	CR-SPLIT=2			40 Secs	
									[==>(Split 1)]	
									[==>(Split 2)]	[1]
	4	2M1207 F60 6W long	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W	CR-SPLIT=3			1809 Secs	
									[==>(Split 1)]	
									[==>(Split 2)]	
									[==>(Split 3)]	[1]



Proposal 12225 - Visit 04 - Imaging accretion sources and circumbinary disks in young brown dwarfs

Visit	Proposal 12225, Visit 05, implementation								Sat Jul 10 04:56:01 GMT 2010		
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: WFC3/UVIS										
	Special Requirements: ORIENT 30D TO 30.1D FROM 03; SEQ 03,04,05 WITHIN 2 Orbits										
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(1)	NAME-2M1207A	RA: 12 07 33.4700 (181.8894583d) Dec: -39 32 54.00 (-39.54833d) Equinox: J2000				V=18.9		Reference Frame: ICRS		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
Exposures	#	Label	Target	Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	2M1207 H-a lpha	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB		F656N	CR-SPLIT=3			120 Secs	
										[==>(Split 1)]	
										[==>(Split 2)]	
										[==>(Split 3)]	[1]
	2	2M1207 continuum	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB		F645N	CR-SPLIT=3			120 Secs	
										[==>(Split 1)]	
										[==>(Split 2)]	
										[==>(Split 3)]	[1]
	3	2M1207 F60 6W short	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-M512C-SUB		F606W	CR-SPLIT=2			40 Secs	
										[==>(Split 1)]	
										[==>(Split 2)]	[1]
	4	2M1207 F60 6W long	(1) NAME-2M1207 A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB		F606W	CR-SPLIT=3			1809 Secs	
										[==>(Split 1)]	
										[==>(Split 2)]	
										[==>(Split 3)]	[1]

