10828 - Debris Disks Around Nearby Young M Dwarfs

Cycle: 15, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Michael C. Liu (PI)	**University of Hawaii**	**mliu@ifa.hawaii.edu**
Dr. David R. Ardila (CoI)	California Institute of Technology	ardila@ipac.caltech.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) GJ-182	ACS/HRC	1	03-Jan-2007 21:37:50.0	yes
02	(4) HD30756	ACS/HRC	1	03-Jan-2007 21:37:56.0	yes
03	(2) TWA-7	ACS/HRC	1	03-Jan-2007 21:38:00.0	yes
04	(3) GJ1135	ACS/HRC	1	03-Jan-2007 21:38:05.0	yes

4 Total Orbits Used

ABSTRACT

We propose to obtain HST/ACS F606W coronagraphic imaging of two young (10--50 Myr), nearby (25--55 pc) M dwarfs to resolve their debris disks in scattered light. Little is known about debris disks around M dwarfs, as very few examples are known and only one, the AU Mic debris disk, has been spatially resolved thus far. IR/sub-mm photometry of our targets indicate large quantities of exceptionally cold dust, comparable to the prototype AU Mic system, and make them excellent candidates for resolved studies with physical resolutions of 1-2 AU. HST/ACS provides an excellent capability for detection of disks in scattered light. Modeling the disk images will allow us to quantify the radial and vertical structure and to

search for disk sub-structure, a potential probe of the planet formation process in these young systems. Our program can expand the census of young resolved debris disks, of which very few are currently known. M dwarfs have been largely over-looked in myriad imaging searches: our program will complement the many current programs focusing on the higher-mass AFGK stars. Because our targets belong to nearby young moving groups with known resolved disks around higher mass stars, a key potential outcome of our program is comparative study of coeval debris disks over a range of stellar masses.

OBSERVING DESCRIPTION

We will use the ACS/HRC coronagraph with the 0.9" mask to resolve disks around two M dwarfs. For each target and PSF reference star we will take short, non-coronagraphic, and long (one orbit each) coronagraphic exposures. The PSF reference star is a star of the same spectral type but brighter and as spatially close to the target as possible. The coronagraphic observations will be done using the F606W filter, which is well calibrated and has been used in the past for this kind of work. Target acquisition is done in a narrow-band filter to avoid saturation. For each target, two orbits are necessary, one for the target and the other for the PSF reference.

Visit

Proposal 10828, Visit 01, completed Thu Jan 04 02:38:07 GMT 2007

Diagnostic Status: Warning

Scientific Instruments: ACS/HRC

Special Requirements: (none)

Diagnostics

(Visit 01) Warning: ACS EXPOSURE TIME ADJUSTED

(Visit 01) Warning: ACS EXPOSURE TIME ADJUSTED

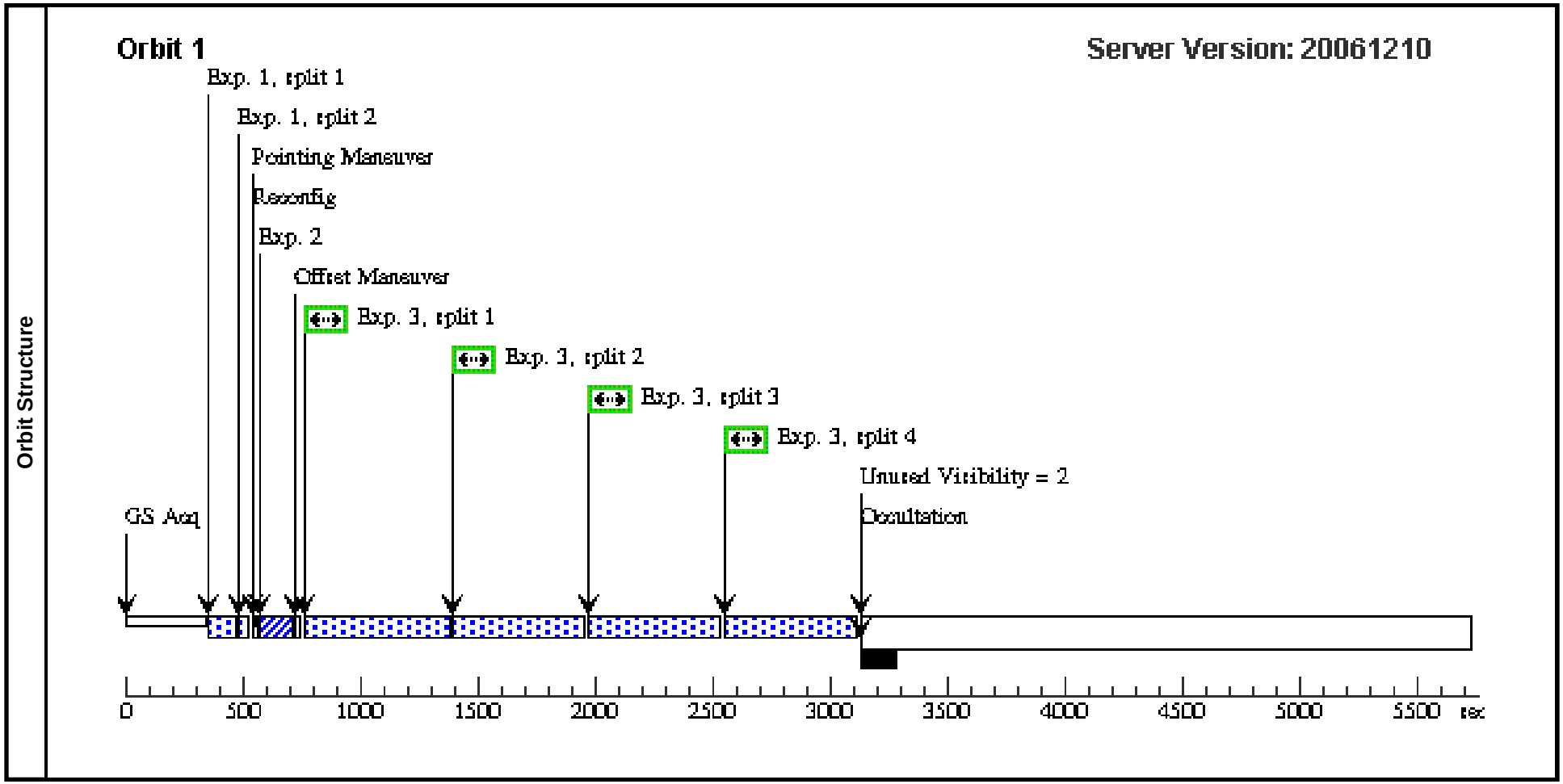
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	GJ-182	RA: 04 59 34.8328 (74.8951367d) Dec: +01 47 0.68 (1.78352d) Equinox: J2000	Proper Motion RA: 0.03715s/yr Proper Motion Dec: -0.09394"/yr Epoch of Position: 1991.25	V=10.1	Reference Frame: ICRS

Comments: Hipparcos Coordinates
V=10.1
B-V=1.37 (Ground-based)

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	GJ182 Direct	(1) GJ-182	ACS/HRC, ACCUM, HRC	F606W	GAIN=4			0.5 Secs	
								[==>(Split 1)] *[==>(Split 2)]*	***[1]***
2	GJ182 ACQ	(1) GJ-182	ACS/HRC, ACQ, HRC-ACQ	F660N				1.0 Secs	
								[==>]	***[1]***
3	GJ182 Coron	(1) GJ-182	ACS/HRC, ACCUM, HRC-CORON1.8	F606W	CR-SPLIT=4; PAREXP=NONE	USE OFFSET 10828 1		2000.0 Secs	
								[==>531.0 Secs (Split 1)] *[==>531.0 Secs (Split 2)]* *[==>531.0 Secs (Split 3)]* *[==>531.0 Secs (Split 4)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20061210
Exp. 1, split 1
Exp. 1, split 2
Pointing Maneuver
Reconfig
Exp. 2
Offset Maneuver
Exp. 3, split 1
Exp. 3, split 2
Exp. 3, split 3
Exp. 3, split 4
Unused Visibility = 2
Occultation
GS Acq
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10828, Visit 02, completed Thu Jan 04 02:38:08 GMT 2007

Diagnostic Status: Warning

Scientific Instruments: ACS/HRC

Special Requirements: AFTER 01 BY 0.8 Orbits TO 1.2 Orbits

Diagnostics

(Visit 02) Warning: ACS EXPOSURE TIME ADJUSTED

(Visit 02) Warning: ACS EXPOSURE TIME ADJUSTED

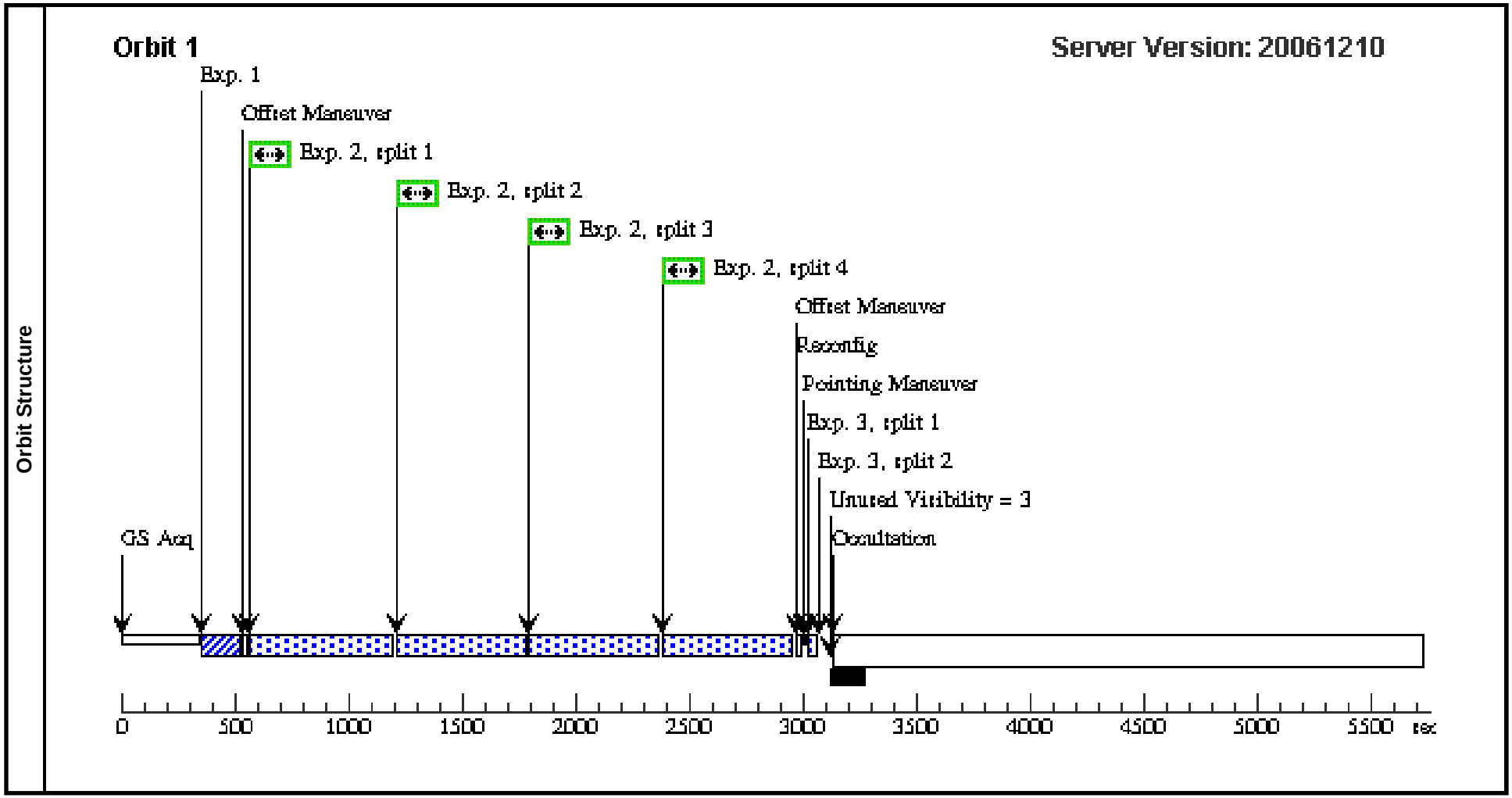
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	HD30756	RA: 04 50 10.2428 (72.5426783d) Dec: -05 12 41.47 (-5.21152d) Equinox: J2000	Proper Motion RA: -0.00673s/yr Proper Motion Dec: 0.00213"/yr Epoch of Position: 1991.25	V=8.17	Reference Frame: ICRS

Comments: Hipparcos Coordinates
V=8.17
No ground based or other photometric measurements. Bt-Vt=1.538

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	PSF-GJ182 Acq	(4) HD30756	ACS/HRC, ACQ, HRC-ACQ	F660N				1.0 Secs	
								[==>]	***[1]***
2	PSF-GJ182 Coron	(4) HD30756	ACS/HRC, ACCUM, HRC-CORON1.8	F606W	CR-SPLIT=4; PAREXP=NONE	USE OFFSET 10821 2		2000.0 Secs	
								[==>539.0 Secs (Split 1)] *[==>539.0 Secs (Split 2)]* *[==>539.0 Secs (Split 3)]* *[==>539.0 Secs (Split 4)]*	***[1]***
3	PSF-GJ182 Direct	(4) HD30756	ACS/HRC, ACCUM, HRC	F606W	GAIN=4			0.5 Secs	
								[==>(Split 1)] *[==>(Split 2)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20061210
Exp. 1
Offset Maneuver
Exp. 2, split 1
Exp. 2, split 2
Exp. 2, split 3
Exp. 2, split 4
Offset Maneuver
Reconfig
Pointing Maneuver
Exp. 3, split 1
Exp. 3, split 2
Unused Visibility = 3
Occultation
GS Acq
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10828, Visit 03, implementation Thu Jan 04 02:38:09 GMT 2007

Diagnostic Status: Warning

Scientific Instruments: ACS/HRC

Special Requirements: (none)

Diagnostics

(Visit 03) Warning: ACS EXPOSURE TIME ADJUSTED

(Visit 03) Warning: ACS EXPOSURE TIME ADJUSTED

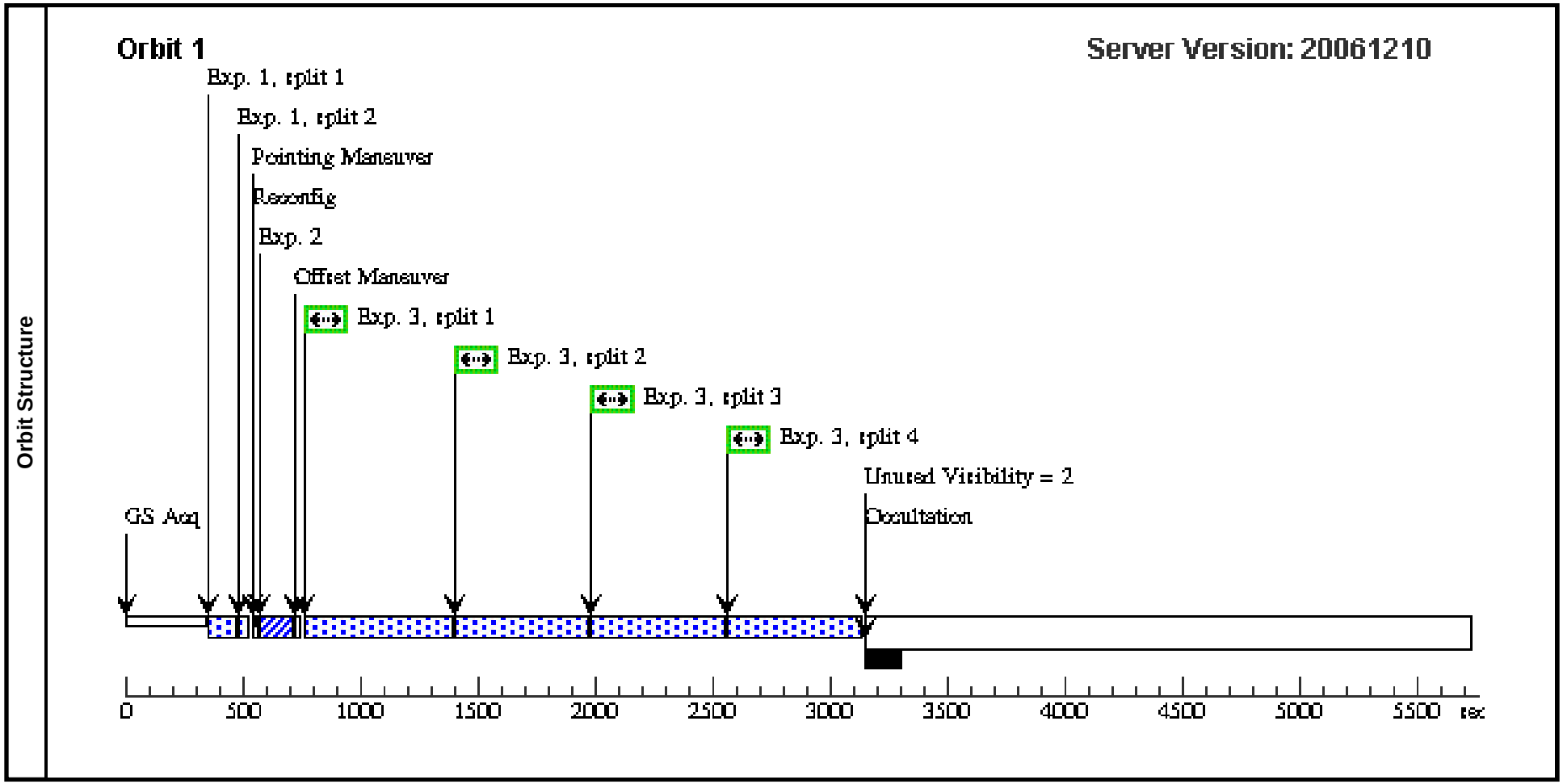
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	TWA-7	RA: 10 42 30.0640 (160.6252667d) Dec: -33 40 16.62 (-33.67128d) Equinox: J2000	Proper Motion RA: -0.00975s/yr Proper Motion Dec: -0.0293"/yr Epoch of Position: 2000.0	V=11.06	Reference Frame: ICRS

Comments: Tycho Coordinates
V=11.65
B-V=1.46 (ground based)

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	TWA7 Direct	(2) TWA-7	ACS/HRC, ACCUM, HRC	F606W	GAIN=4			0.5 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
2	TWA7 ACQ	(2) TWA-7	ACS/HRC, ACQ, HRC-ACQ	F660N				1.0 Secs *[==>]*	***[1]***
3	TWA7 Coron	(2) TWA-7	ACS/HRC, ACCUM, HRC-CORON1.8	F606W	CR-SPLIT=4; PAREXP=NONE	USE OFFSET 10828 3		2000.0 Secs *[==>536.0 Secs (Split 1)]* *[==>536.0 Secs (Split 2)]* *[==>536.0 Secs (Split 3)]* *[==>536.0 Secs (Split 4)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20061210
Exp. 1, split 1
Exp. 1, split 2
Pointing Maneuver
Reconfig
Exp. 2
Offset Maneuver
Exp. 3, split 1
Exp. 3, split 2
Exp. 3, split 3
Exp. 3, split 4
Unused Visibility = 2
Occultation
GS Acq
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10828, Visit 04, implementation Thu Jan 04 02:38:09 GMT 2007

Diagnostic Status: Warning

Scientific Instruments: ACS/HRC

Special Requirements: AFTER 03 BY 0.8 Orbits TO 1.2 Orbits

Diagnostics

(Visit 04) Warning: ACS EXPOSURE TIME ADJUSTED

(Visit 04) Warning: ACS EXPOSURE TIME ADJUSTED

Fixed Targets

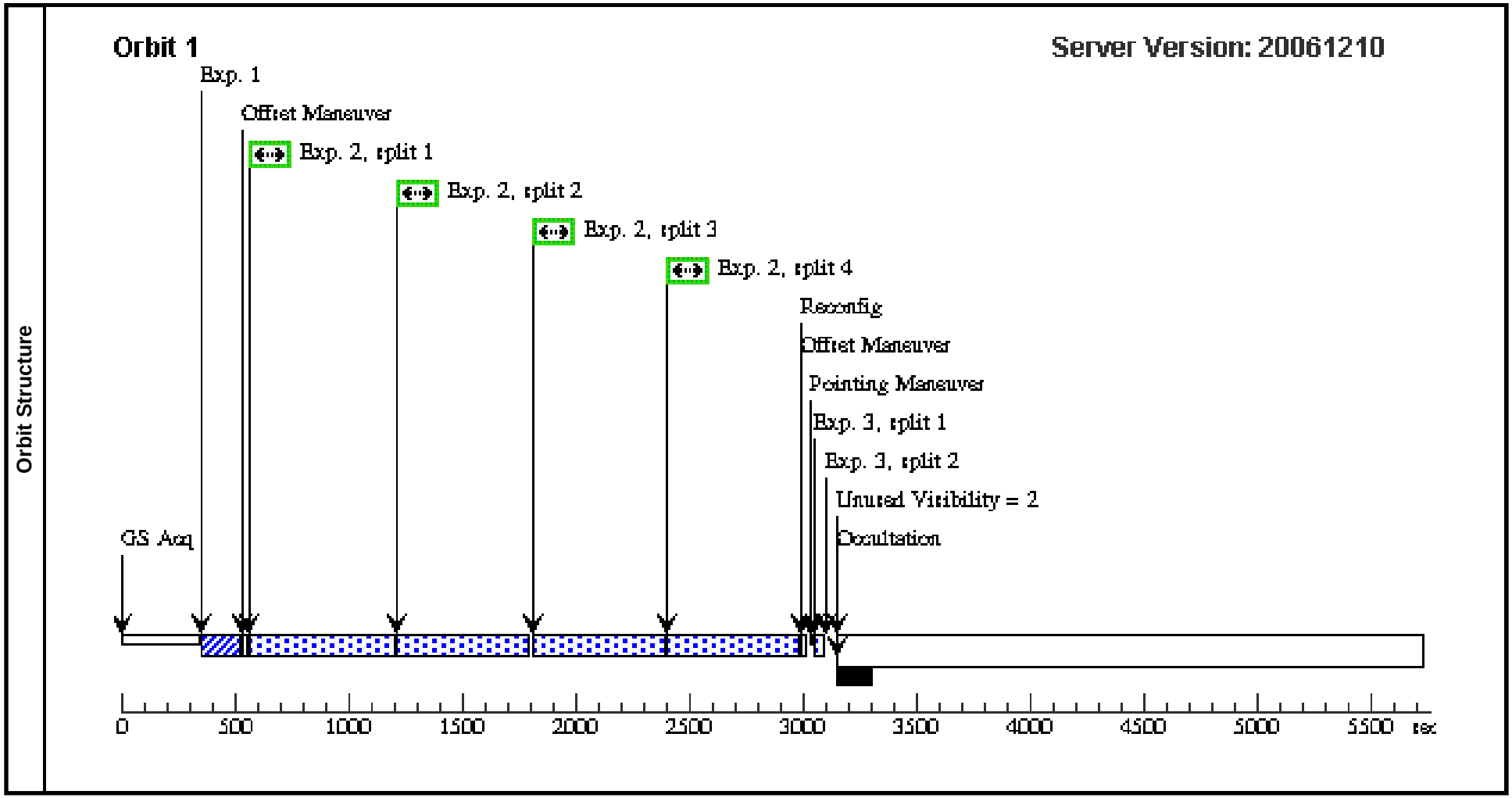
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	GJ1135	RA: 10 41 9.3260 (160.2888583d) Dec: -36 53 43.58 (-36.89544d) Equinox: J2000	Proper Motion RA: 0.0139s/yr Proper Motion Dec: -0.1936"/yr Epoch of Position: 2000.0	V=10.0+/-0.05	Reference Frame: ICRS

Comments: Hipparcos Coordinates

V=10
B-V=1.465

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	PSF-TWA7 Acq	(3) GJ1135	ACS/HRC, ACQ, HRC-ACQ	F660N				1.0 Secs	
								[==>]	***[1]***
2	PSF-TWA7 Coron	(3) GJ1135	ACS/HRC, ACCUM, HRC-CORON1.8	F606W	CR-SPLIT=4; PAREXP=NONE	USE OFFSET 10821 4		1500.0 Secs	
								[==>546.0 Secs (Split 1)] *[==>546.0 Secs (Split 2)]* *[==>546.0 Secs (Split 3)]* *[==>546.0 Secs (Split 4)]*	***[1]***
3	PSF-TWA7 Direct	(3) GJ1135	ACS/HRC, ACCUM, HRC	F606W	GAIN=4			0.5 Secs	
								[==>(Split 1)] *[==>(Split 2)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20061210
Exp. 1
Offset Maneuver
Exp. 2, split 1
Exp. 2, split 2
Exp. 2, split 3
Exp. 2, split 4
Reconfig
Offset Maneuver
Pointing Maneuver
Exp. 3, split 1
Exp. 3, split 2
Unused Visibility = 2
Occultation
GS Acq
0
500
1000
1500
2000
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3000
3500
4000
4500
5000
5500
sec