



## 11168 - The IMF in the Hidden Galactic Starburst W49A

Cycle: 16, Proposal Category: GO

(Availability Mode: SUPPORTED)

### INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
<b>Dr. Bernhard R. Brandl (PI)</b>	<b>Universiteit Leiden</b>	<b>brandl@strw.leidenuniv.nl</b>
Dr. Joao Alves (CoI) (ESA Member)	Calar Alto Observatory, Spain	jalves@caha.es
Dr. Edward B. Churchwell (CoI) (AdminUSPI)	University of Wisconsin - Madison	churchwell@astro.wisc.edu
Dr. Nicole Homeier (CoI)	The Johns Hopkins University	nhomeier@pha.jhu.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	(1) W49A-OB	NIC2	6	18-Jan-2008 01:44:57.0	yes
02	(2) W49-CONTROLFIELD (3) W49A-UCHIIR	NIC2	3	18-Jan-2008 01:46:29.0	yes

9 Total Orbits Used

### ABSTRACT

W49A is one of the most luminous and prolific massive star formation regions in the disk of our Milky Way. Given the presence of several very massive OB clusters as well as an unusually high concentration of many young ultra-compact HII regions (UCHIIR) -- all embedded in about 1 million solar masses of molecular gas -- it is arguably the best Galactic template for a luminous starburst region.

We propose to obtain NICMOS imaging of the central part of W49A, covering a strip from the central, massive OB cluster to the ring of UCHIIRs. Our goals are to resolve and characterize the central star cluster and determine its IMF down to about 1 solar mass. We want to characterize the distribution of intermediate-mass YSOs, and identify the NIR counterparts to the UCHIIRs. The combination of the proposed HST/NICMOS data with our recently obtained Spitzer observations would allow a great step forward in the understanding of massive star and cluster formation.

### **OBSERVING DESCRIPTION**

Our strategy is to image a representative strip of five adjacent positions across the central part of W49A with NIC2 in the F110W, F160W, and F205W filters. The most important, known locations are the central OB cluster at 19:10:17.52, +09:06:22.1 (J2000), and the Welch ring of UCHIIR at 19:10:13.40, +09:06:12.8 (J2000). The five adjacent pointings, will include those two locations.

observing sequence:

Orbit 1: Guide star acquisition: 360s, Instrument setup (F110W): 18s, Position 1: 2700s

Orbit 2: Instrument setup (F110W): 18s, Position 1: 3100s

Orbit 3: Instrument setup (F160W): 18s, Position 1: 700s, Instrument setup (F205W): 18s, Position 1: 1280s, SAM to position 2: 40s, Position 2 ? part 1: 1000s

Orbit 4: Instrument setup (F205W): 18s, Position 2 ? part 2: 280s, Instrument setup (F160W): 18s, Position 2: 700s, Instrument setup (F110W): 18s, Position 2: 1280s, SAM to position 3: 40s, Position 3 ? part 1: 700s

Orbits 5-7: continue in the way of orbits 3 and 4 until all five positions have been observed.

Orbit 8: Guide star acquisition: 360s, Instrument setup (F110W): 18s, Control Field position: 2700s

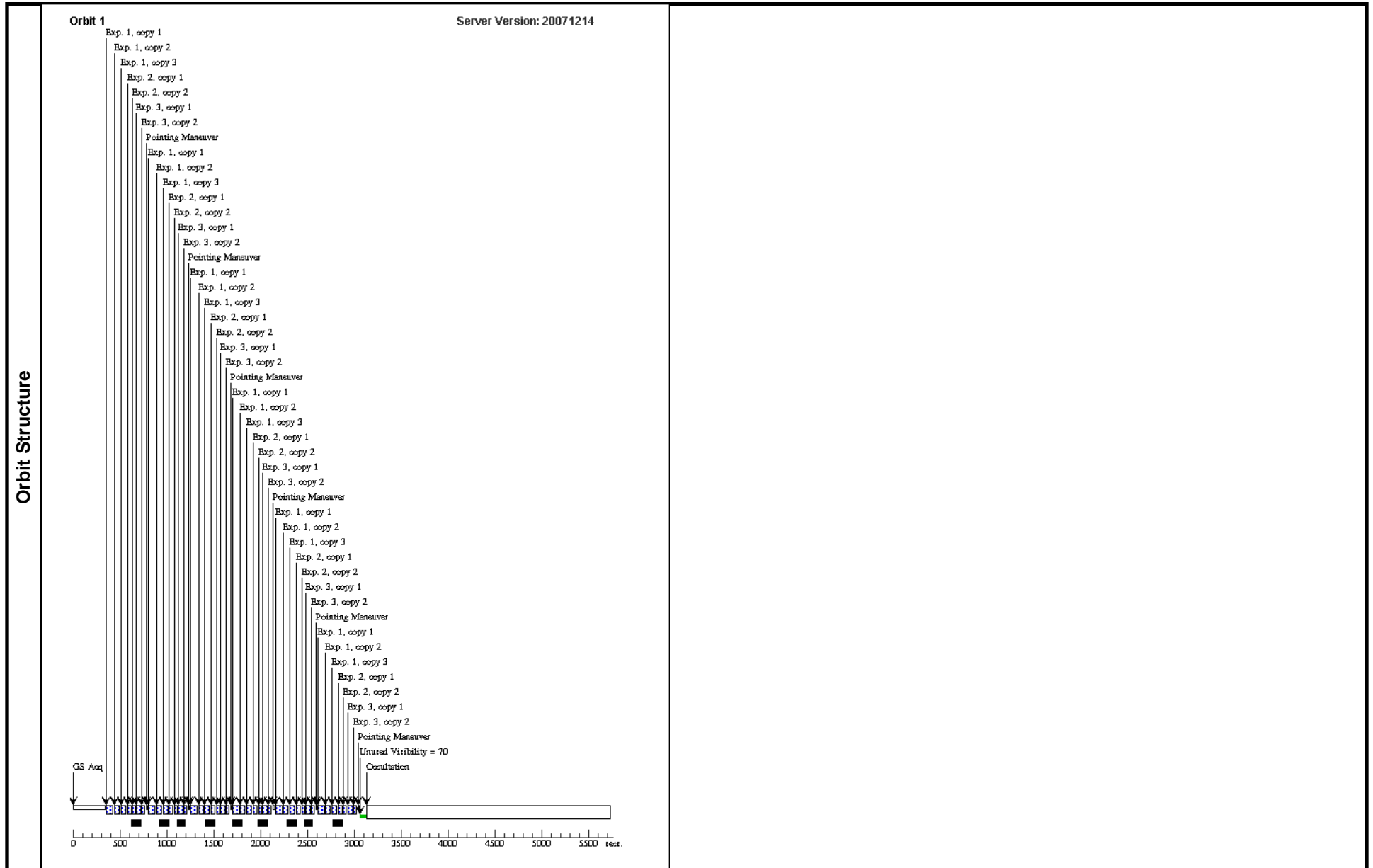
Orbit 9: Instrument setup (F110W): 18s, Control field position: 1000s, Instrument setup (F160W): 18s, Control field position: 700s, Instrument setup (F205W): 18s, Control field position: 1280s.

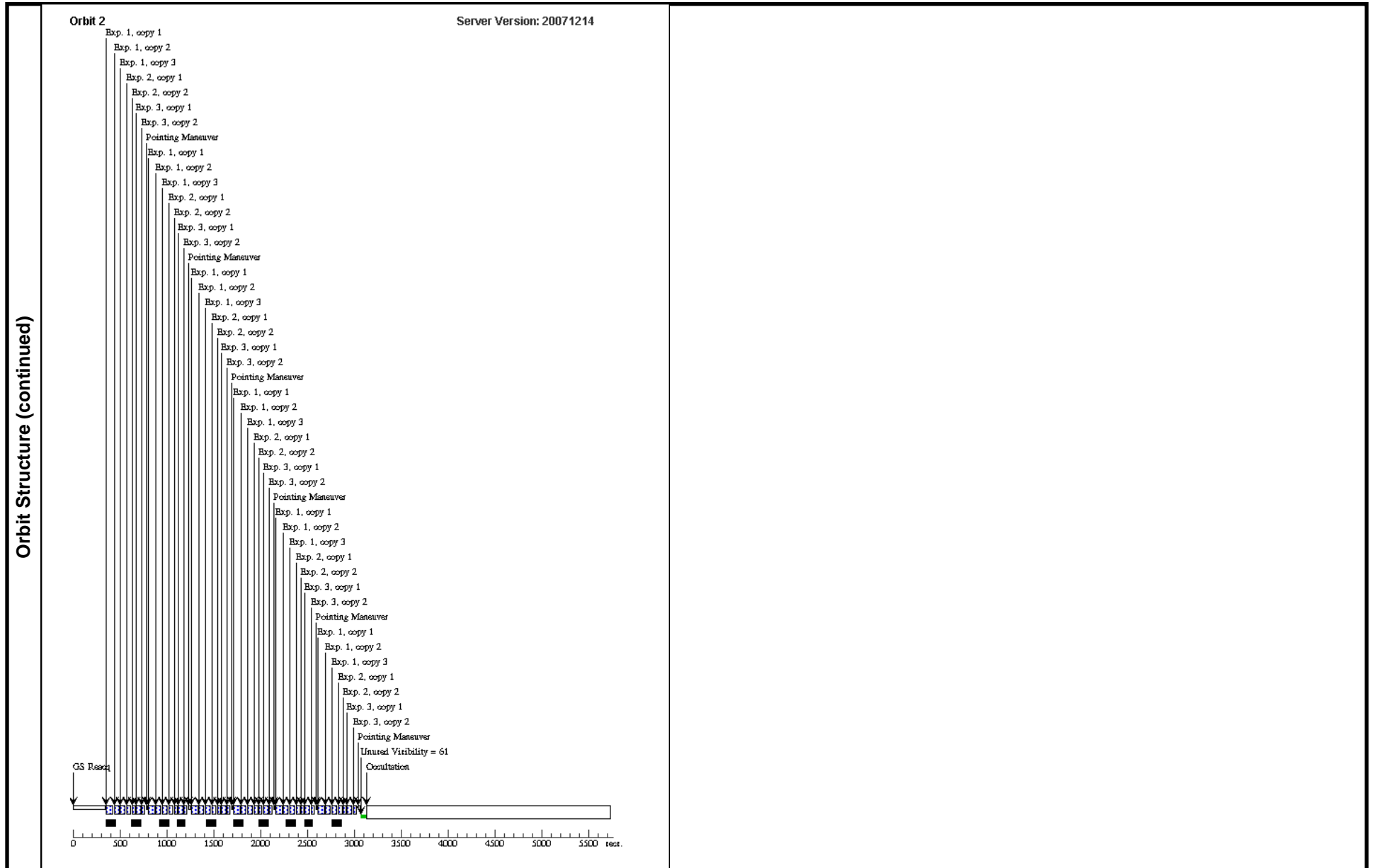
The total time requested for object and control field adds up to 9 orbits.

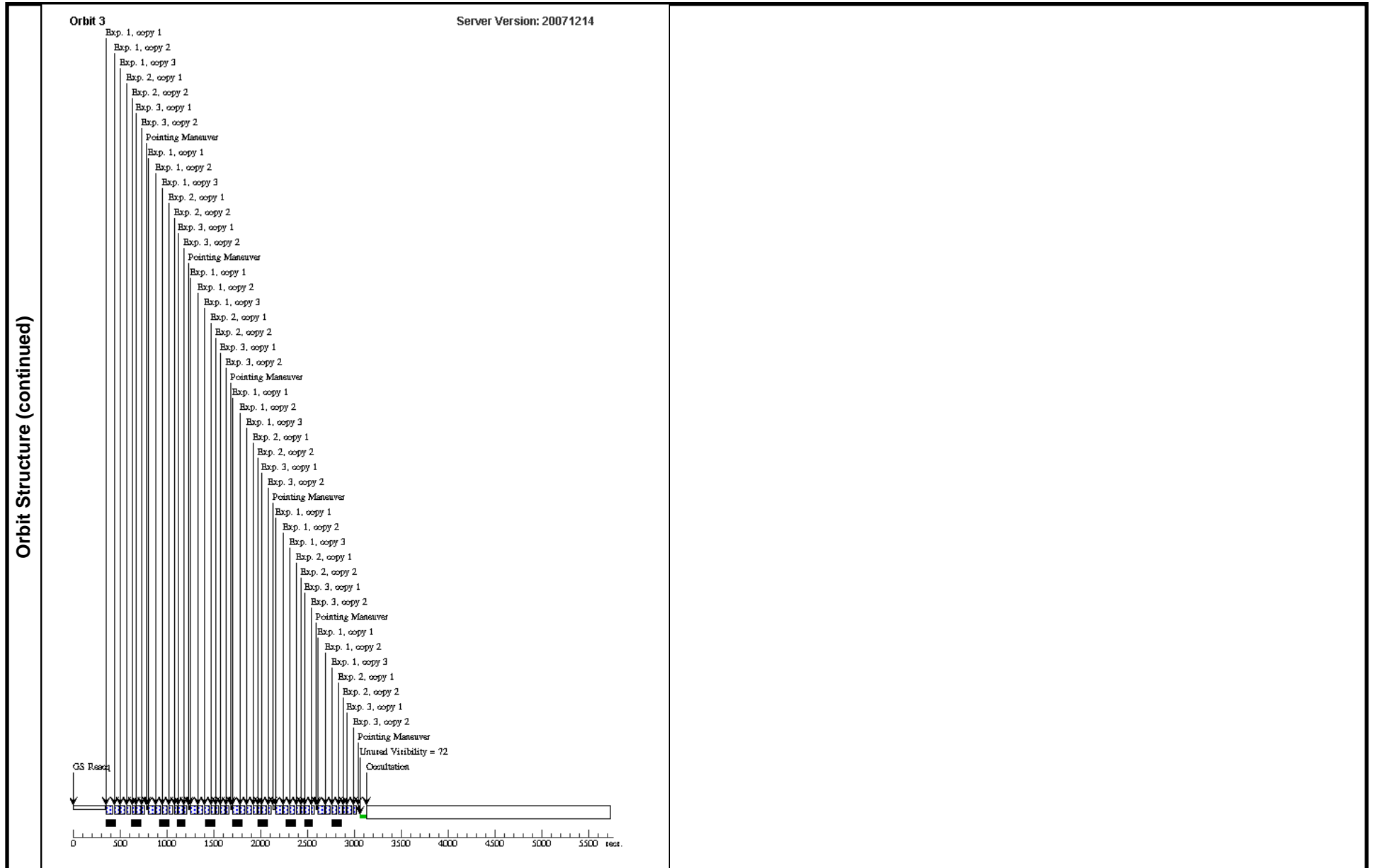
Proposal 11168 - Visit 01 - The IMF in the Hidden Galactic Starburst W49A

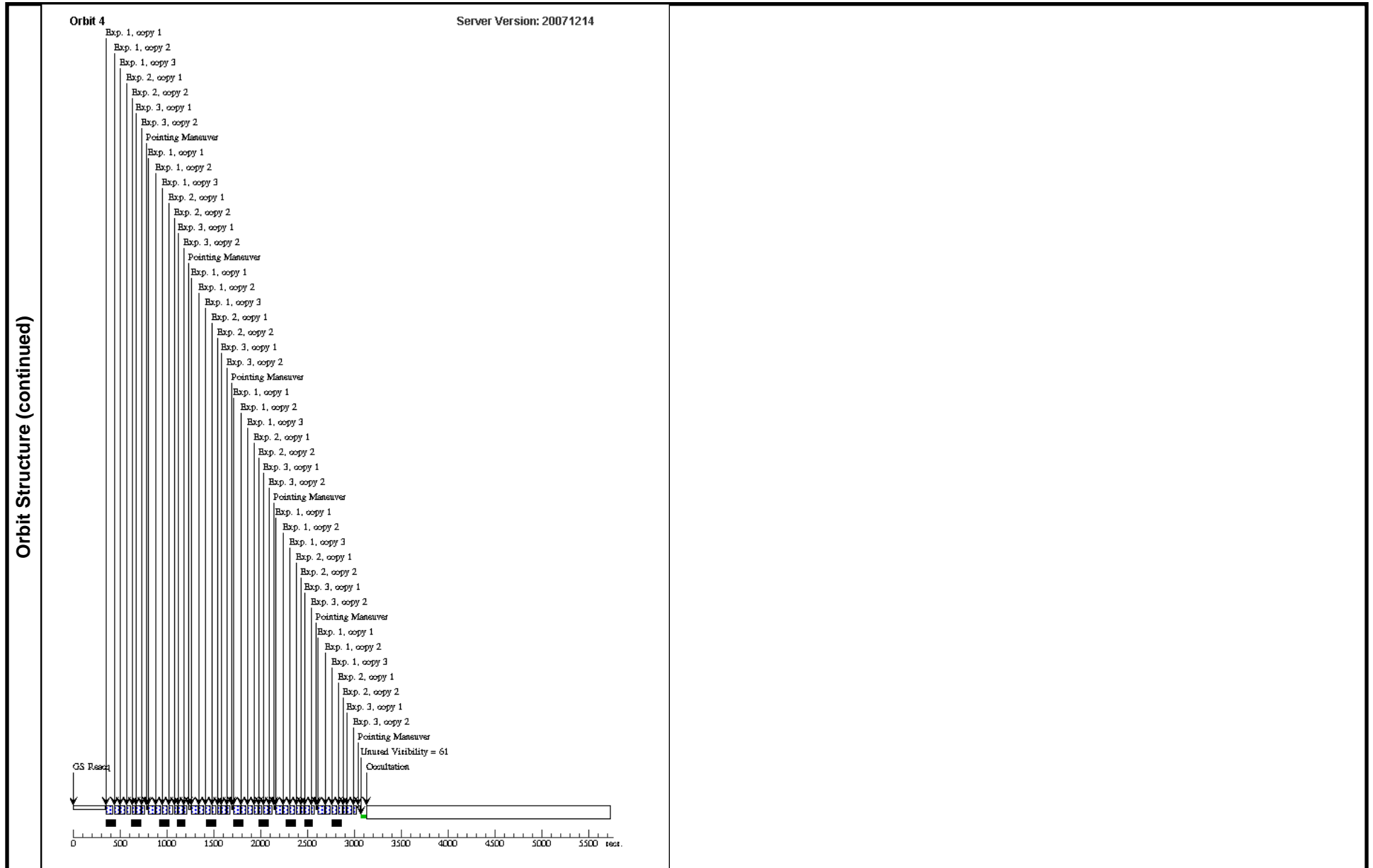
Fri Jan 18 06:46:41 GMT 2008

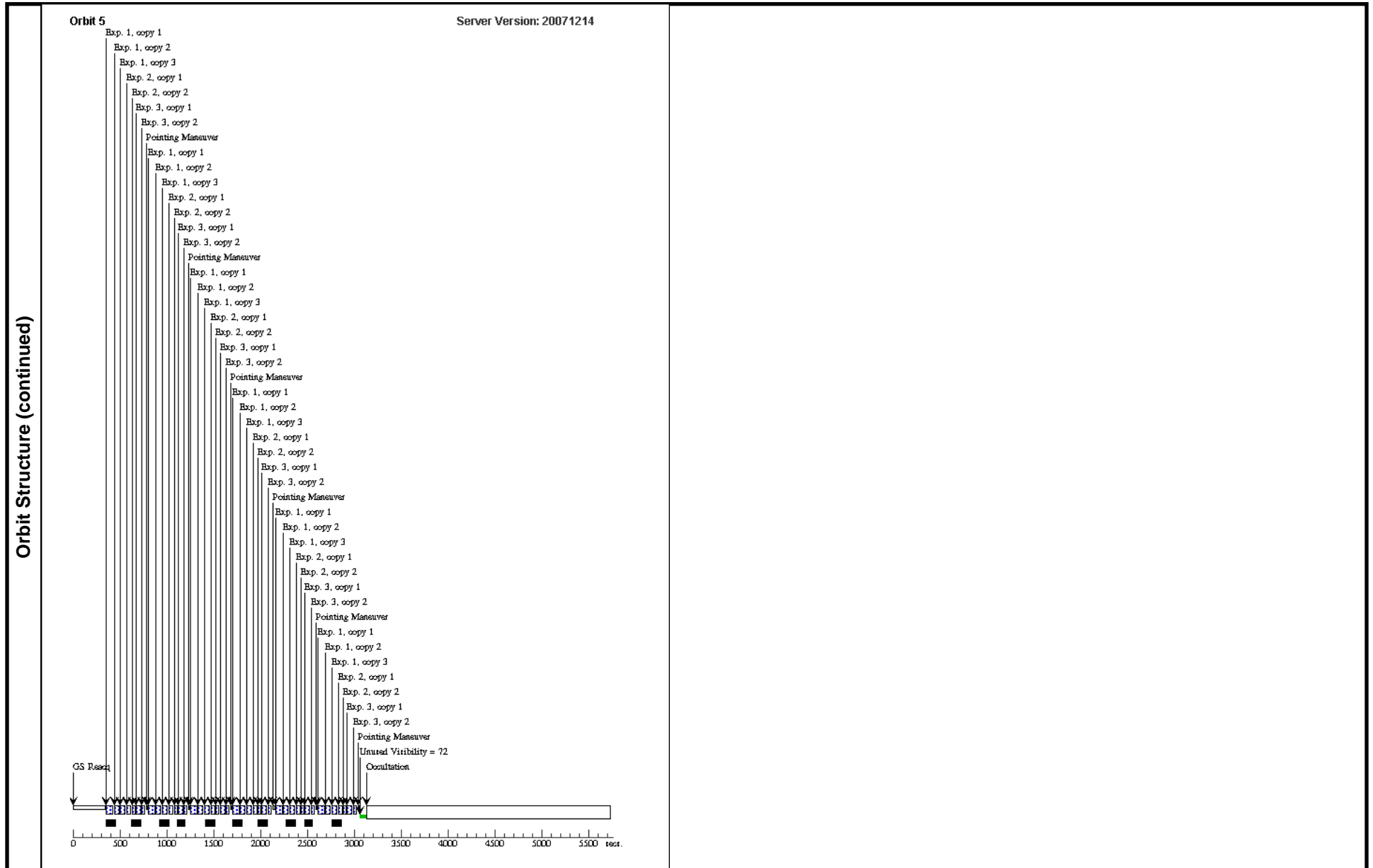
<b>Visit</b>	<b>Proposal 11168, Visit 01</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: NIC2 Special Requirements: (none) <i>Comments: Central OB cluster in F110W, F165M, F207M</i>					
	<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>	<b>Secondary Pattern</b>	<b>Exposures</b>	
	(1)	Pattern Type=NIC-SPIRAL-MAP      Coordinate Frame=CELESTIAL Purpose=MOSAIC                      Pattern Orientation=0.0 Number Of Points=9                  Angle Between Sides= Point Spacing=9.0                    Center Pattern=true Line Spacing=	Pattern Type=NIC-SPIRAL-DITH      Coordinate Frame=POS-TARG Purpose=DITHER                      Pattern Orientation=0.0 Number Of Points=4                  Angle Between Sides= Point Spacing=1.125                Center Pattern=true Line Spacing=	(1-3)		
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>
	(1)	W49A-OB	RA: 19 10 17.1400 (287.5714167d) Dec: +09 06 17.90 (9.10497d) Equinox: J2000		V=18+/-3	Reference Frame: ICRS













Proposal 11168 - Visit 02 - The IMF in the Hidden Galactic Starburst W49A

Fri Jan 18 06:46:47 GMT 2008

Visit	<b>Proposal 11168, Visit 02</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: NIC2 Special Requirements: (none) Comments: <i>UCHIIR Welch ring and control field in F110W, F165M and F207M</i>									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(2)	Pattern Type=NIC-SPIRAL-DITH	Coordinate Frame=POS-TARG					(1-3), (4-6)	
		Purpose=DITHER	Pattern Orientation=0.0							
		Number Of Points=9	Angle Between Sides=							
		Point Spacing=1.125	Center Pattern=true							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	W49-CONTROLFIELD	RA: 19 10 33.3000 (287.6387500d) Dec: +09 01 39.00 (9.02750d) Equinox: J2000		V=20+/-3	Reference Frame: ICRS				
	(3)	W49A-UCHIIR	RA: 19 10 13.4000 (287.5558333d) Dec: +09 06 13.10 (9.10364d) Equinox: J2000		V=18+/-3	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	UCHIIR-J	(3) W49A-UCHIIR	NIC2, MULTIACCUM, NIC2	F110W	CAMERA-FOCUS=DEF; NSAMP=17; SAMP-SEQ=SPAR S4		Pattern 1-3 (2)	[==>(Pattern 1, Copy 1)] [==>(Pattern 1, Copy 2)] [==>(Pattern 2, Copy 1)] [==>(Pattern 2, Copy 2)] [==>(Pattern 3, Copy 1)] [==>(Pattern 3, Copy 2)] [==>(Pattern 4, Copy 1)] [==>(Pattern 4, Copy 2)] [==>(Pattern 5, Copy 1)] [==>(Pattern 5, Copy 2)] [==>(Pattern 6, Copy 1)] [==>(Pattern 6, Copy 2)] [==>(Pattern 7, Copy 1)] [==>(Pattern 7, Copy 2)]	[1]
									[==>(Pattern 8, Copy 1)] [==>(Pattern 8, Copy 2)] [==>(Pattern 9, Copy 1)] [==>(Pattern 9, Copy 2)]	[2]

Proposal 11168 - Visit 02 - The IMF in the Hidden Galactic Starburst W49A

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
Exposures (continued)	2	UCHIIR-H	(3) W49A-UCHIIR	NIC2, MULTIACCUM, NIC2	F165M	CAMERA-FOCUS=DEF; NSAMP=10; SAMP-SEQ=SPAR S4	Pattern 1-3 (2)	[==>(Pattern 1, Copy 1)]	[1]
								[==>(Pattern 1, Copy 2)]	
								[==>(Pattern 2, Copy 1)]	
								[==>(Pattern 2, Copy 2)]	
								[==>(Pattern 3, Copy 1)]	
								[==>(Pattern 3, Copy 2)]	
								[==>(Pattern 4, Copy 1)]	
								[==>(Pattern 4, Copy 2)]	
								[==>(Pattern 5, Copy 1)]	
	[==>(Pattern 5, Copy 2)]								
	[==>(Pattern 6, Copy 1)]								
	[==>(Pattern 6, Copy 2)]								
	[==>(Pattern 7, Copy 1)]								
	[==>(Pattern 7, Copy 2)]								
	[==>(Pattern 8, Copy 1)]	[2]							
	[==>(Pattern 8, Copy 2)]								
	[==>(Pattern 9, Copy 1)]								
	[==>(Pattern 9, Copy 2)]								
3	UCHIIR-K	(3) W49A-UCHIIR	NIC2, MULTIACCUM, NIC2	F207M	CAMERA-FOCUS=DEF; NSAMP=12; SAMP-SEQ=SPAR S4	Pattern 1-3 (2)	[==>(Pattern 1, Copy 1)]	[1]	
							[==>(Pattern 1, Copy 2)]		
							[==>(Pattern 2, Copy 1)]		
							[==>(Pattern 2, Copy 2)]		
							[==>(Pattern 3, Copy 1)]		
							[==>(Pattern 3, Copy 2)]		
							[==>(Pattern 4, Copy 1)]		
							[==>(Pattern 4, Copy 2)]		
							[==>(Pattern 5, Copy 1)]		
	[==>(Pattern 5, Copy 2)]								
	[==>(Pattern 6, Copy 1)]								
	[==>(Pattern 6, Copy 2)]								
	[==>(Pattern 7, Copy 1)]								
	[==>(Pattern 7, Copy 2)]								
	[==>(Pattern 8, Copy 1)]	[2]							
	[==>(Pattern 8, Copy 2)]								
	[==>(Pattern 9, Copy 1)]								
	[==>(Pattern 9, Copy 2)]								

Proposal 11168 - Visit 02 - The IMF in the Hidden Galactic Starburst W49A

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
4	Control-J	(2) W49-CONTROL FIELD	NIC2, MULTIACCUM, NIC2	F110W	CAMERA-FOCUS=DEF; NSAMP=17; SAMP-SEQ=SPAR S4		Pattern 4-6 (2)	[==>(Pattern 1, Copy 1)]	[2]
								[==>(Pattern 1, Copy 2)]	
								[==>(Pattern 2, Copy 1)]	
								[==>(Pattern 2, Copy 2)]	
								[==>(Pattern 3, Copy 1)]	
								[==>(Pattern 3, Copy 2)]	
								[==>(Pattern 4, Copy 1)]	
								[==>(Pattern 4, Copy 2)]	
								[==>(Pattern 5, Copy 1)]	[3]
								[==>(Pattern 5, Copy 2)]	
								[==>(Pattern 6, Copy 1)]	
								[==>(Pattern 6, Copy 2)]	
								[==>(Pattern 7, Copy 1)]	
								[==>(Pattern 7, Copy 2)]	
								[==>(Pattern 8, Copy 1)]	
								[==>(Pattern 8, Copy 2)]	
								[==>(Pattern 9, Copy 1)]	
								[==>(Pattern 9, Copy 2)]	
5	Control-H	(2) W49-CONTROL FIELD	NIC2, MULTIACCUM, NIC2	F165M	CAMERA-FOCUS=DEF; NSAMP=10; SAMP-SEQ=SPAR S4		Pattern 4-6 (2)	[==>(Pattern 1, Copy 1)]	[2]
								[==>(Pattern 1, Copy 2)]	
								[==>(Pattern 2, Copy 1)]	
								[==>(Pattern 2, Copy 2)]	
								[==>(Pattern 3, Copy 1)]	
								[==>(Pattern 3, Copy 2)]	
								[==>(Pattern 4, Copy 1)]	
								[==>(Pattern 4, Copy 2)]	[3]
								[==>(Pattern 5, Copy 1)]	
								[==>(Pattern 5, Copy 2)]	
								[==>(Pattern 6, Copy 1)]	
								[==>(Pattern 6, Copy 2)]	
								[==>(Pattern 7, Copy 1)]	
								[==>(Pattern 7, Copy 2)]	
								[==>(Pattern 8, Copy 1)]	
								[==>(Pattern 8, Copy 2)]	
								[==>(Pattern 9, Copy 1)]	
								[==>(Pattern 9, Copy 2)]	

Exposures (continued)

Proposal 11168 - Visit 02 - The IMF in the Hidden Galactic Starburst W49A

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
Exposures (continued)	6	(2) W49-CONTROL FIELD	NIC2, MULTIACCUM, NIC2	F207M	CAMERA-FOCUS=DEF;		Pattern 4-6 (2)	[==>(Pattern 1, Copy 1)]	[2]
	[==>(Pattern 1, Copy 2)]								
	[==>(Pattern 2, Copy 1)]								
	[==>(Pattern 2, Copy 2)]								
	[==>(Pattern 3, Copy 1)]								
	[==>(Pattern 3, Copy 2)]								
	[==>(Pattern 4, Copy 1)]	[3]							
	[==>(Pattern 4, Copy 2)]								
	[==>(Pattern 5, Copy 1)]								
	[==>(Pattern 5, Copy 2)]								
	[==>(Pattern 6, Copy 1)]								
	[==>(Pattern 6, Copy 2)]								
	[==>(Pattern 7, Copy 1)]								
	[==>(Pattern 7, Copy 2)]								
	[==>(Pattern 8, Copy 1)]								
	[==>(Pattern 8, Copy 2)]								
	[==>(Pattern 9, Copy 1)]								
	[==>(Pattern 9, Copy 2)]								



