



# 11708 - Determining the Sub-stellar IMF in the Most Massive Young Milky Way Cluster, Westerlund 1

Cycle: 17, Proposal Category: GO

(Availability Mode: SUPPORTED)

## INVESTIGATORS

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## 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) WESTERLUND1-FIELD	WFC3/IR	4	05-Oct-2009 21:01:21.0	yes
02	(1) CL-WESTERLUND1	WFC3/IR	4	05-Oct-2009 21:01:39.0	yes
03	(1) CL-WESTERLUND1	WFC3/IR	4	05-Oct-2009 21:01:51.0	yes
04	(1) CL-WESTERLUND1	WFC3/IR	4	05-Oct-2009 21:02:06.0	yes
05	(1) CL-WESTERLUND1	WFC3/IR	4	05-Oct-2009 21:02:17.0	yes

20 Total Orbits Used

## **ABSTRACT**

Despite over 50 years of active research, a key question in galactic astronomy remains unanswered: is the initial mass function (IMF) of stars and sub-stellar objects universal, or does it depend on initial conditions? The answer has profound consequences for the evolution of galaxies as well as a predictive theory of star formation. Work to date suggests that certain environments (high densities, e.g. Elmegreen 2004; low metallicity, e.g. Larson 2005) should produce a top-heavy IMF, and there are hints from unresolved star-bursts that this might be the case. Yet, there is no clear evidence for an IMF that differs from that characterizing the Galactic field stars in a resolved stellar population down to one solar mass.

Westerlund 1 is the most massive young star cluster known in the Milky Way. With an estimated mass of  $5 \times 10^4 M_{\text{sun}}$ , an age of 3-5 Myr, and located at a distance of 3-4 kpc, it presents a unique opportunity to test whether the IMF in such a cluster deviates from the norm well down into the brown dwarf regime. We propose WFC3 near-IR imaging to probe the IMF down to 40 Jupiter masses. The data will enable use to: 1) provide a stringent test of the universality of the IMF under conditions approximating those of star-bursts; 2) search for primordial or dynamic mass segregation in the clusters; and 3) assess whether the cluster is likely to remain bound (as a massive open cluster) or disperse into the field. We will obtain images in the F125W, F160W, and F139M filters. The F139M filter covers a strong water absorption feature and the color F125W/F139M is a powerful temperature diagnostic in the range 2800-4000 K. This information will enable us to: a) confirm membership for low mass stars suspected on the basis of their position in the color-magnitude diagram; b) place the members in the HR diagram; and c) estimate the masses and ages of cluster members for low-mass stars and sub-stellar objects.

This new capability offered with the WFC3 (through a novel combination of filter complement, high spatial resolution, and large field of view) will enable us to make a fundamental test of whether the IMF is universal on a unique resolved stellar population, as well as assess the clusters structure, dynamics, and ultimate fate.

## **OBSERVING DESCRIPTION**

This programme aims at imaging the young massive star cluster Westerlund 1 in the Galactic plane.

We observe in the F125W, F139M, and F160W bands.

We cover the cluster in a 2\*2 mosaic with almost a whole chip length between the positions (110 arcseconds)

The dither pattern is a bit atypical due to very bright stars in the field which might give persistence effects and to the large scale offset restrictions for

the HST.

Each visit will cover two positions in the mosaic: one with 4 images in the three filters and one with 3 images.

Each visit contains 4 orbits.

We move one position in the mosaic each time so in the end all 4 positions will have been imaged 7 times in each filter.

We found that this observing strategy gave the least amount of overhead and still provided large scale dithers to mitigate the effects of persistence.

### **REAL TIME JUSTIFICATION**

no realtime observations are needed

### **CALIBRATION JUSTIFICATION**

Standard calibration is sufficient.

### **ADDITIONAL COMMENTS**

Note that the orientation of the mosaic is not important.

However, it is critical that the four visits on the cluster have the same orientation.

The control field

Proposal 11708 - Visit 01 - Determining the Sub-stellar IMF in the Most Massive Young Milky Way Cluster, Westerlund 1

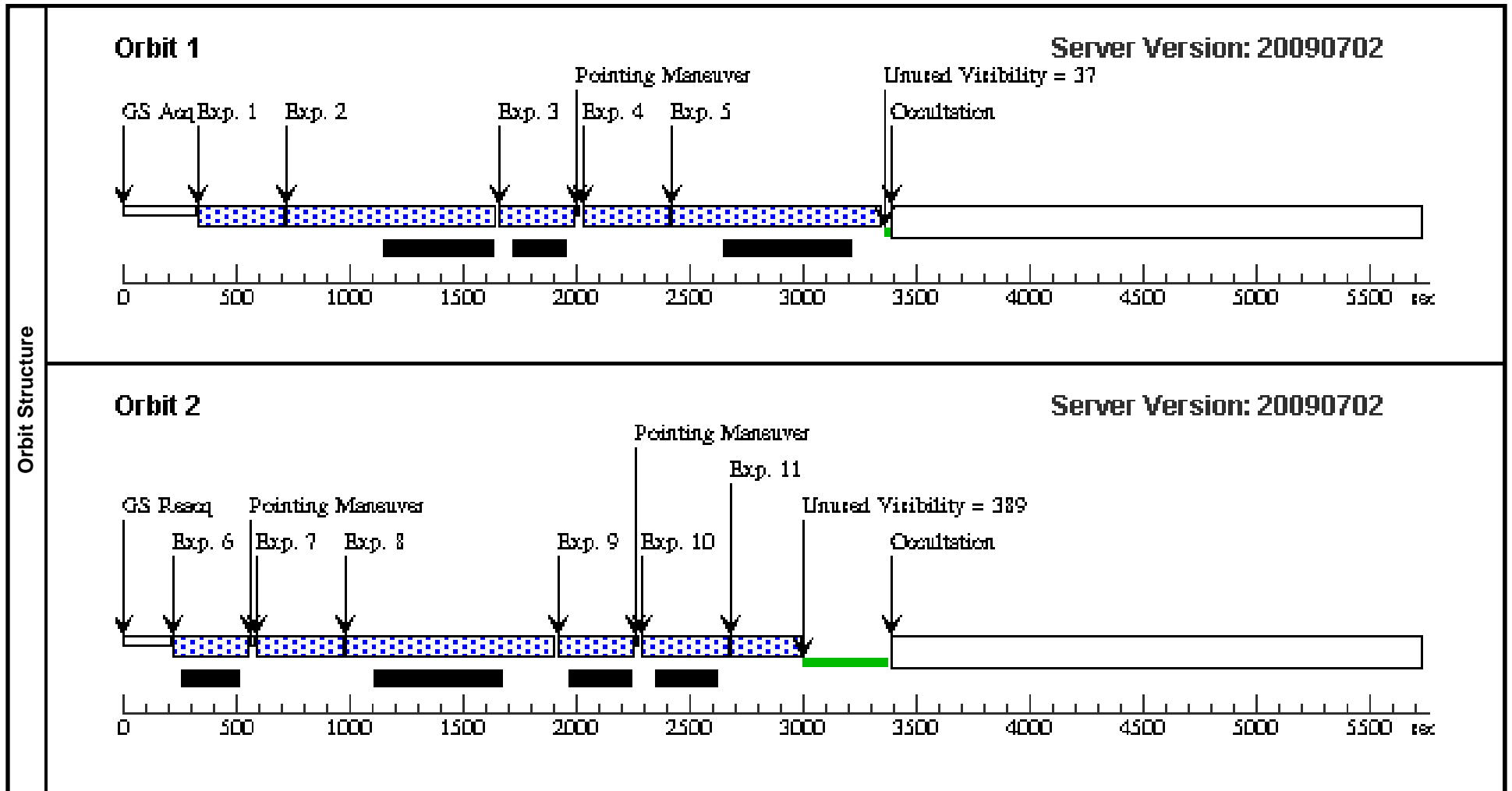
Tue Oct 06 01:02:22 GMT 2009

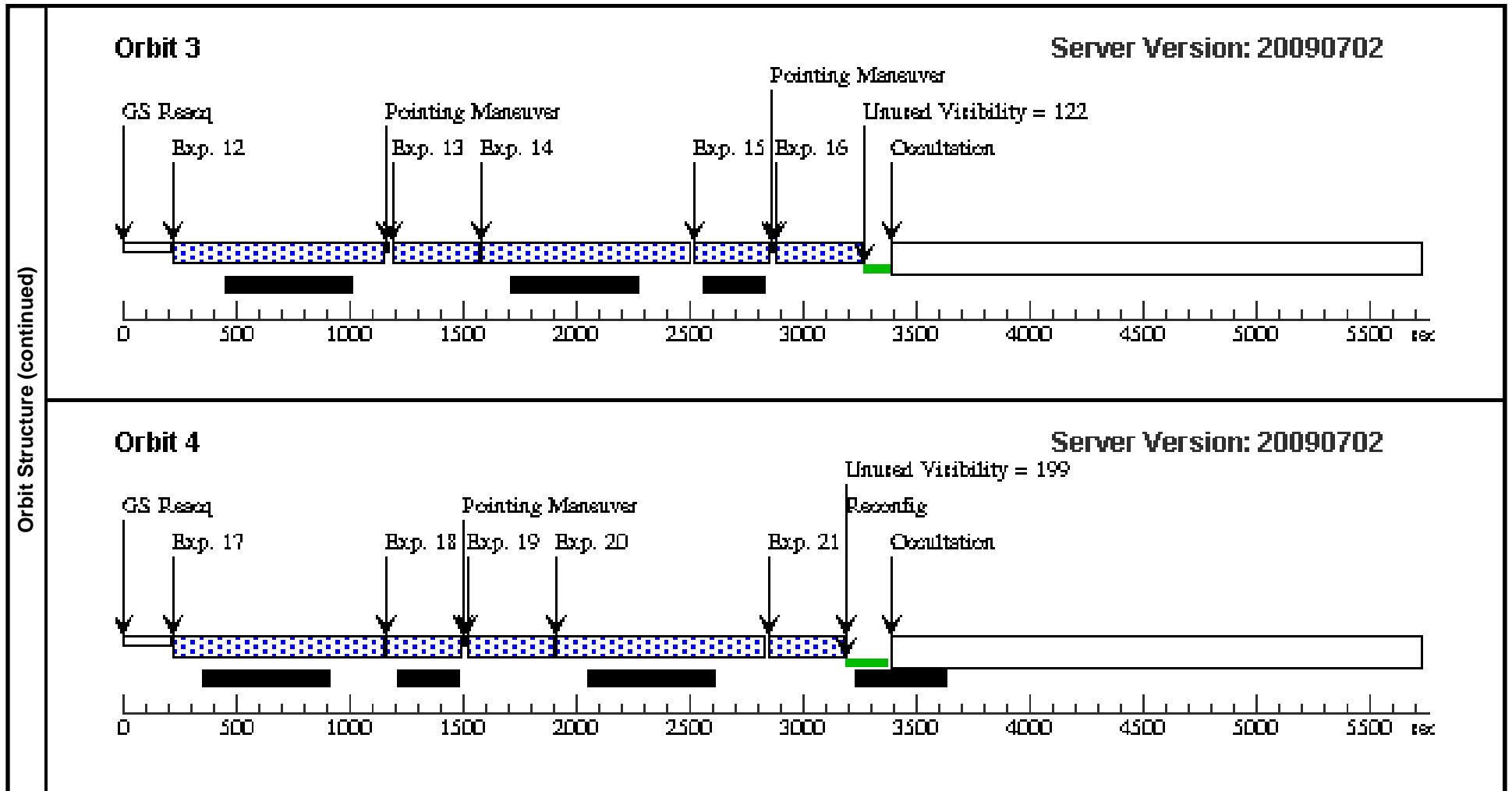
<b>Visit</b>	<p><b>Proposal 11708, Visit 01, implementation</b></p> <p><b>Diagnostic Status: No Diagnostics</b></p> <p>Scientific Instruments: WFC3/IR</p> <p>Special Requirements: PCS MODE FINE</p> <p><i>Comments: Visit to observe the control field for Westerlund 1. The visit contains 4 orbits. There is a total of 21 exposures, 7 in F125W, 7 in F139M, and 7 in F160W. The F125W and F160W observations use the Step50 sequency whereas the F139 observations uses Step100 We sample up the ramp to the 12, 11, and 15 step in F125W, F160W, and F139, respectively. The observations are done in a dither pattern where a set of F125W, F139M, and F160W is done at each position before the telescope is moved a few arcseconds. The F160W and F139M offsets are linked to the F125W offsets. Typically, the sequence order is F125W-F139M-F160W, except where a swap of F160W and F139M observations improved the use of orbit time. There is no orientation restrictions for this visit. IR-FIX is chosen to be centered on the chip.</i></p>									
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(2)	WESTERLUND1-FIELD	RA: 16 47 43.0000 (251.9291667d) Dec: -46 03 47.00 (-46.06306d) Equinox: J2000		V=16	Reference Frame: ICRS				
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time/[Actual Dur.]</b>	<b>Orbit</b>
	1	(2) WESTERLUND 1-FIELD	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0			[==>]	[1]
	2	(2) WESTERLUND 1-FIELD	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00			[==>]	[1]
	3	(2) WESTERLUND 1-FIELD	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0			[==>]	[1]
	4	(2) WESTERLUND 1-FIELD	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 4,-4		[==>]	[1]
	5	(2) WESTERLUND 1-FIELD	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 4		[==>]	[1]
	6	(2) WESTERLUND 1-FIELD	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 4		[==>]	[2]
	7	(2) WESTERLUND 1-FIELD	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -3,2.5		[==>]	[2]

Proposal 11708 - Visit 01 - Determining the Sub-stellar IMF in the Most Massive Young Milky Way Cluster, Westerlund 1

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
8	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 7		[==>]	[2]	
9	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 7		[==>]	[2]	
10	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -4,-4		[==>]	[2]	
11	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 10		[==>]	[2]	
12	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 10		[==>]	[3]	
13	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -2,3		[==>]	[3]	
14	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 13		[==>]	[3]	
15	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 13		[==>]	[3]	
16	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 0,2		[==>]	[3]	
17	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 16		[==>]	[4]	
18	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 16		[==>]	[4]	
19	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -3,3		[==>]	[4]	
20	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 19		[==>]	[4]	
21	(2) WESTERLUND 1-FIELD	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 19		[==>]	[4]	

Exposures (continued)





Proposal 11708 - Visit 02 - Determining the Sub-stellar IMF in the Most Massive Young Milky Way Cluster, Westerlund 1

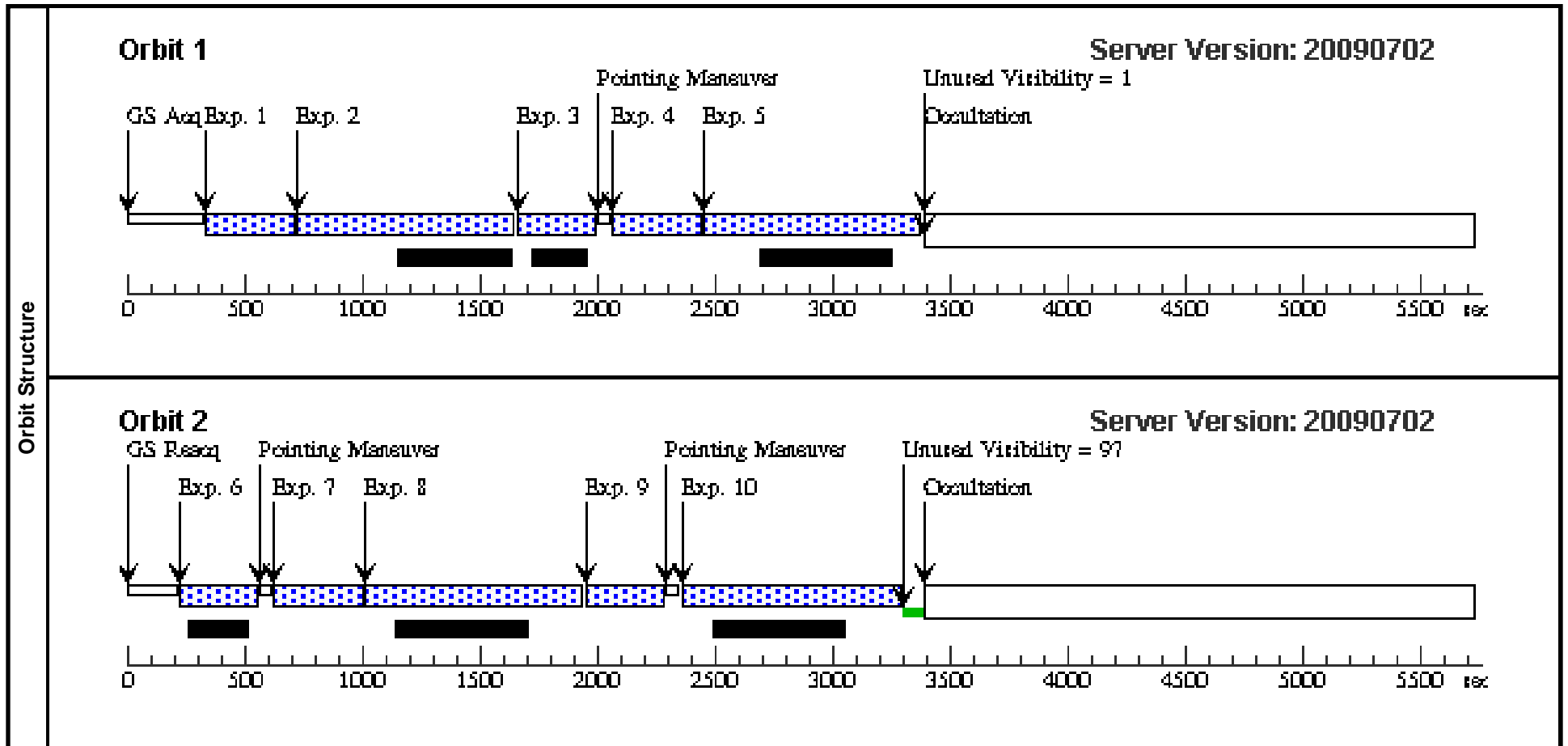
Tue Oct 06 01:02:24 GMT 2009

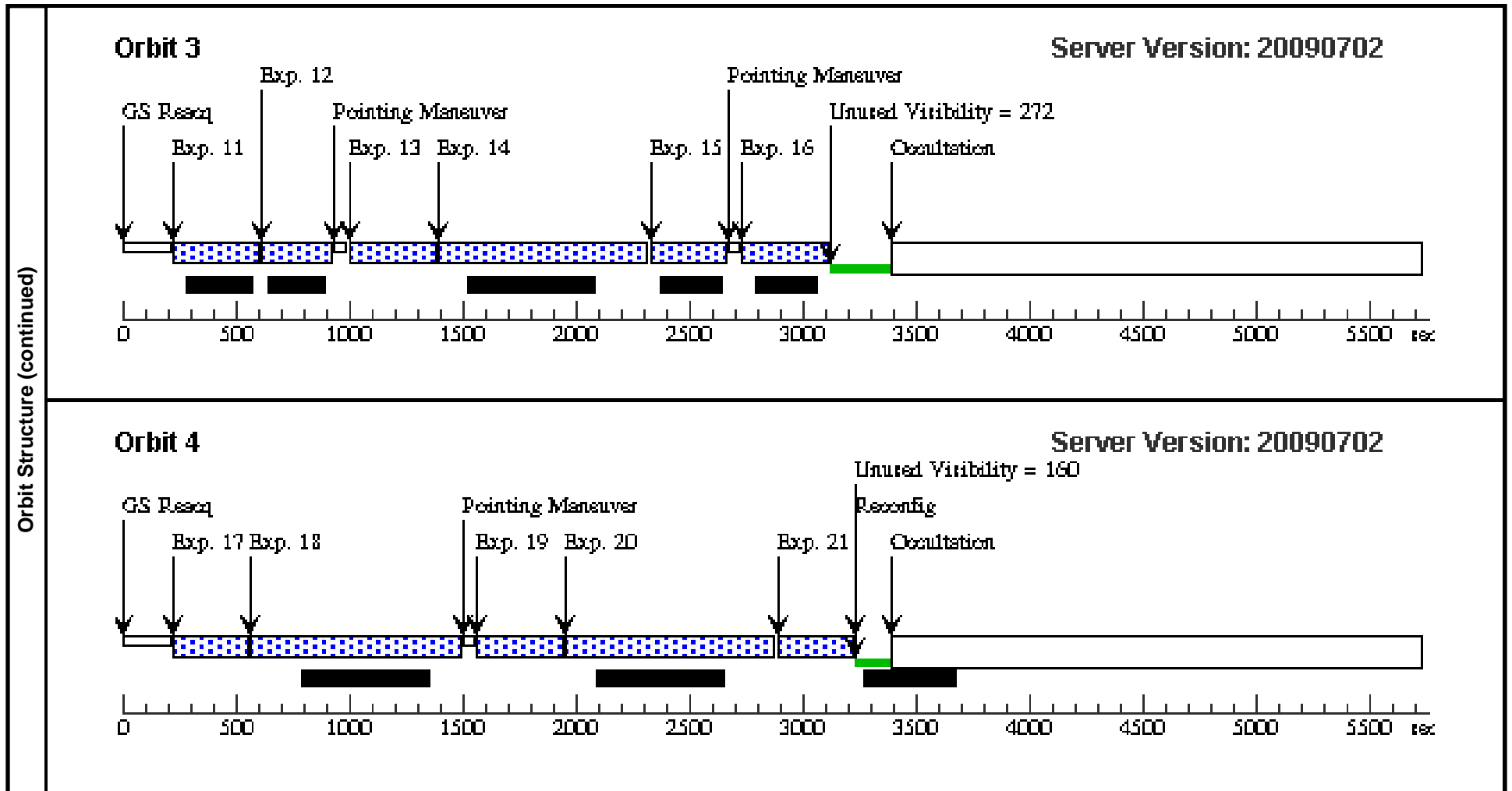
<b>Visit</b>	<p><b>Proposal 11708, Visit 02, implementation</b></p> <p><b>Diagnostic Status: No Diagnostics</b></p> <p>Scientific Instruments: WFC3/IR</p> <p>Special Requirements: PCS MODE FINE</p> <p><i>Comments: Visit to observe two pointing in a 2*2 mosaic of Westerlund 1</i></p> <p><i>The visit contains 4 orbits.</i></p> <p><i>There is a total of 21 exposures, 7 in F125W, 7 in F139M, and 7 in F160W.</i></p> <p><i>The F125W and F160W observations use the Step50 sequency whereas the F139 observations uses Step100.</i></p> <p><i>We sample up the ramp to 12, 11, and 15 step in F125W, F160W, and F139, respectively.</i></p> <p><i>Two positions in the mosaic are targeted: Position one centered at (-55,-55) and position two centered at (-55,55). The first position is visited 4 times in each filter and the second three times.</i></p> <p><i>For each position, the offsets for the second and third filter to be used are linked to the first (i.e. position 5 and 6 are linked to position 4, position 11 and 12 to position 10 etc.).</i></p> <p><i>The F160W and F139M offsets are linked to the F125W offsets.</i></p> <p><i>Typically, the sequence order is F125W-F139M-F160W, except where a swap of F160W and F139M observations improved the use of orbit time.</i></p> <p><i>There is no orientation restrictions for this visit but visit three, four and five are requested to have the same orientation, which is critical for the success of this program.</i></p> <p><i>IR-FIX is chosen to have the cluster centered on the mosaic.</i></p>									
	<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)		CL-WESTERLUND1	RA: 16 47 4.0000 (251.7666667d) Dec: -45 50 42.00 (-45.84500d) Equinox: J2000		V=12	Reference Frame: ICRS				
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>										
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time/[Actual Dur.]</b>	<b>Orbit</b>
	1	(1) CL-WESTERLU ND1	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -55,-55		[==>]	[1]
	2	(1) CL-WESTERLU ND1	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 1		[==>]	[1]
	3	(1) CL-WESTERLU ND1	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 1		[==>]	[1]
	4	(1) CL-WESTERLU ND1	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -55,55		[==>]	[1]
	5	(1) CL-WESTERLU ND1	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 4		[==>]	[1]
	6	(1) CL-WESTERLU ND1	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 4		[==>]	[2]
	7	(1) CL-WESTERLU ND1	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -53,-57		[==>]	[2]

Proposal 11708 - Visit 02 - Determining the Sub-stellar IMF in the Most Massive Young Milky Way Cluster, Westerlund 1

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
8		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 7		[==>]	[2]
9		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 7		[==>]	[2]
10		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	POS TARG -53,53		[==>]	[2]
11		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	SAME POS AS 10		[==>]	[3]
12		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 10		[==>]	[3]
13		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -57,-53		[==>]	[3]
14		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 13		[==>]	[3]
15		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 13		[==>]	[3]
16		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -57,57		[==>]	[3]
17		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 16		[==>]	[4]
18		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 16		[==>]	[4]
19		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -53,-53		[==>]	[4]
20		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 19		[==>]	[4]
21		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 19		[==>]	[4]

Exposures (continued)





Proposal 11708 - Visit 03 - Determining the Sub-stellar IMF in the Most Massive Young Milky Way Cluster, Westerlund 1

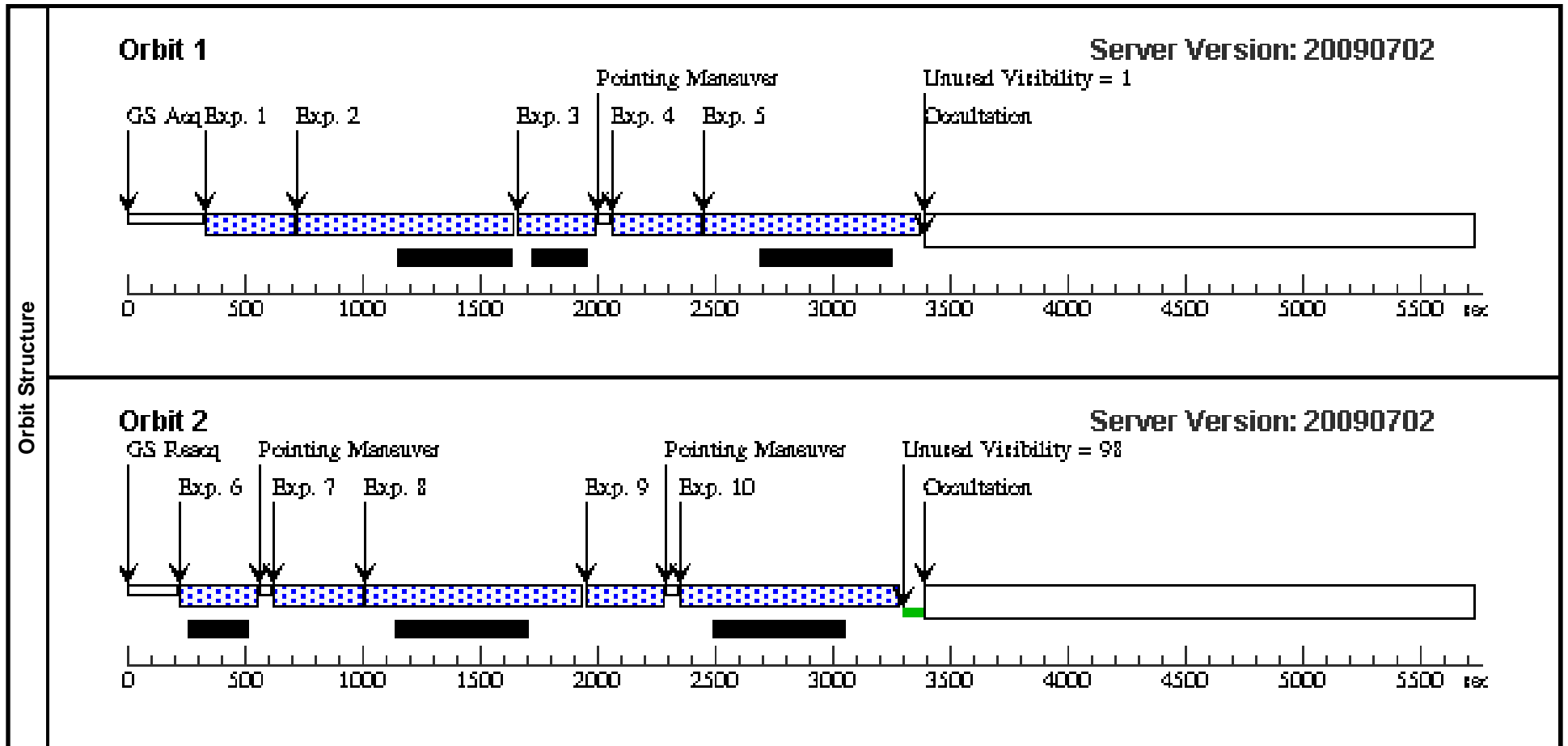
Tue Oct 06 01:02:26 GMT 2009

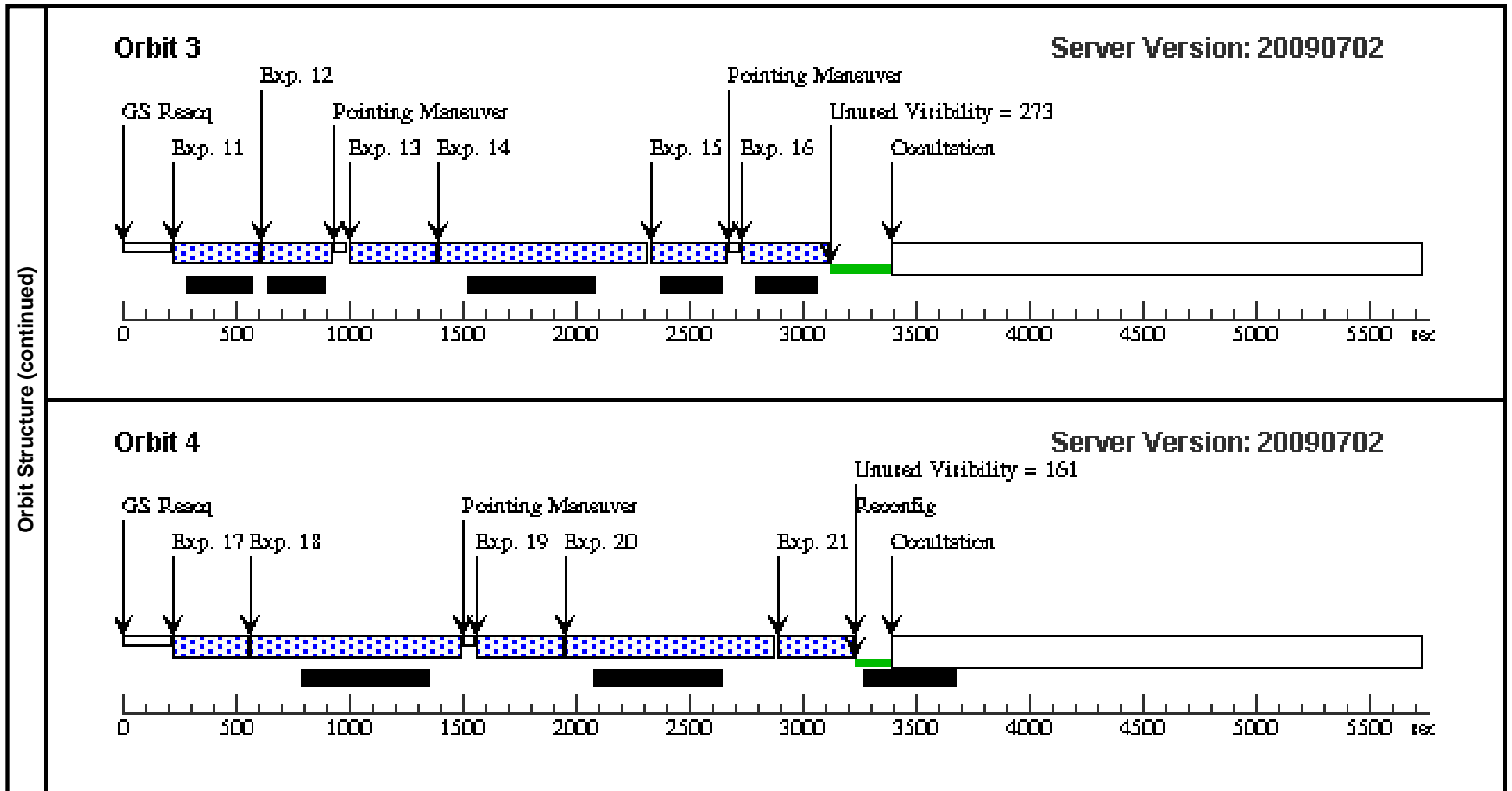
Visit	<b>Proposal 11708, Visit 03, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/IR Special Requirements: PCS MODE FINE; SAME ORIENT AS 02 Comments: Similar visit to Westerlund 1 as for visit 2: The differences are: Two positions in the mosaic are targeted: Position one centered at (-55,55) and position two centered at (55,55). The first position is visited 4 times and the second three times.																		
	Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>CL-WESTERLUND1</td> <td>RA: 16 47 4.0000 (251.7666667d) Dec: -45 50 42.00 (-45.84500d) Equinox: J2000</td> <td></td> <td>V=12</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td colspan="6">Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</td> </tr> </tbody> </table>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	CL-WESTERLUND1	RA: 16 47 4.0000 (251.7666667d) Dec: -45 50 42.00 (-45.84500d) Equinox: J2000		V=12	Reference Frame: ICRS	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.				
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous														
(1)	CL-WESTERLUND1	RA: 16 47 4.0000 (251.7666667d) Dec: -45 50 42.00 (-45.84500d) Equinox: J2000		V=12	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	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -57,53		[==>]	[1]										
	2	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 1		[==>]	[1]										
	3	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 1		[==>]	[1]										
	4	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 55,55		[==>]	[1]										
	5	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 4		[==>]	[1]										
	6	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 4		[==>]	[2]										
	7	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -53,57		[==>]	[2]										
	8	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 7		[==>]	[2]										
	9	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 7		[==>]	[2]										

Proposal 11708 - Visit 03 - Determining the Sub-stellar IMF in the Most Massive Young Milky Way Cluster, Westerlund 1

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
10	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	POS TARG 57,53			[==>]	[2]
11	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	SAME POS AS 10			[==>]	[3]
12	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 10			[==>]	[3]
13	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -52,54			[==>]	[3]
14	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 13			[==>]	[3]
15	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 13			[==>]	[3]
16	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 53,57			[==>]	[3]
17	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 16			[==>]	[4]
18	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 16			[==>]	[4]
19	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -55,58			[==>]	[4]
20	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 19			[==>]	[4]
21	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 19			[==>]	[4]

Exposures (continued)





Proposal 11708 - Visit 04 - Determining the Sub-stellar IMF in the Most Massive Young Milky Way Cluster, Westerlund 1

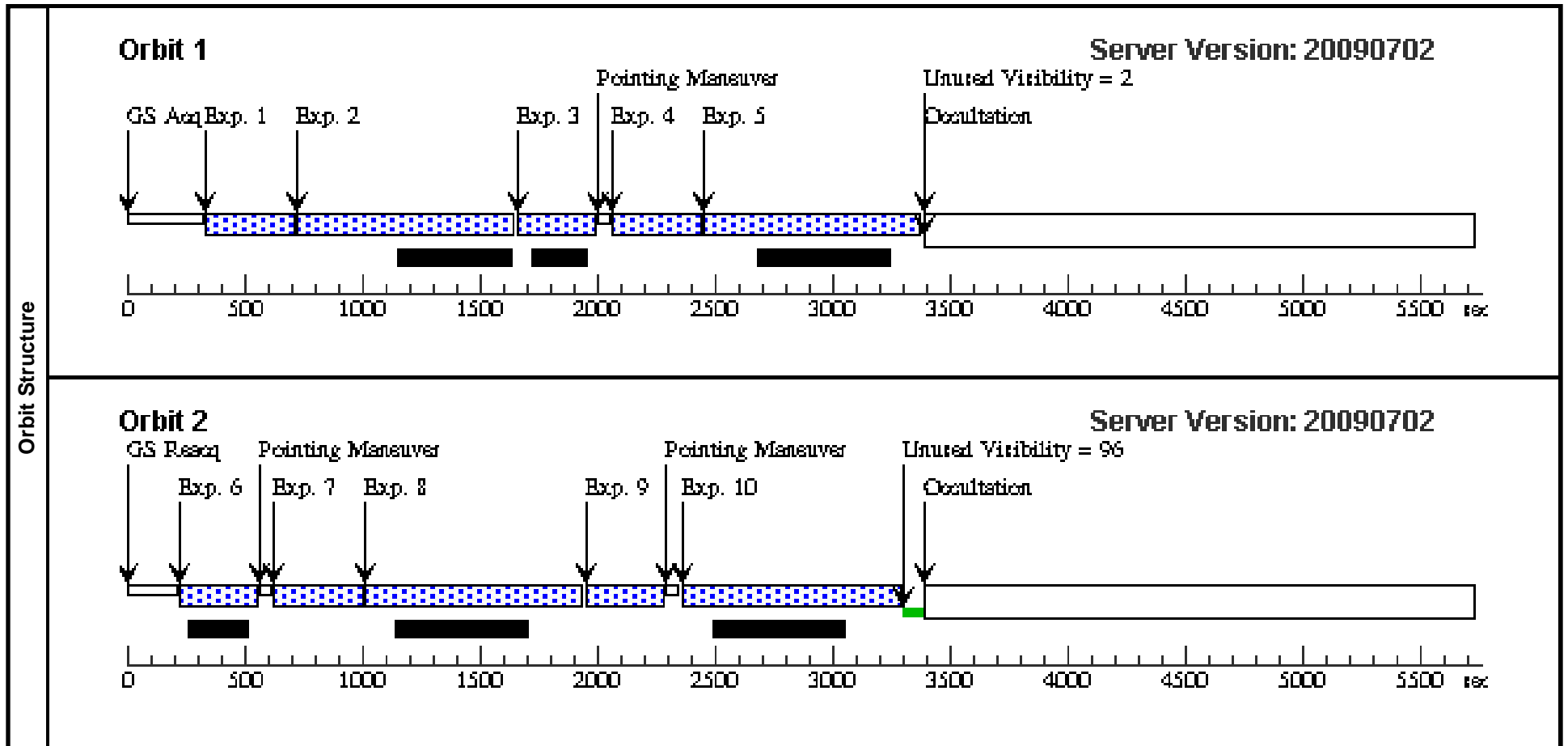
Tue Oct 06 01:02:28 GMT 2009

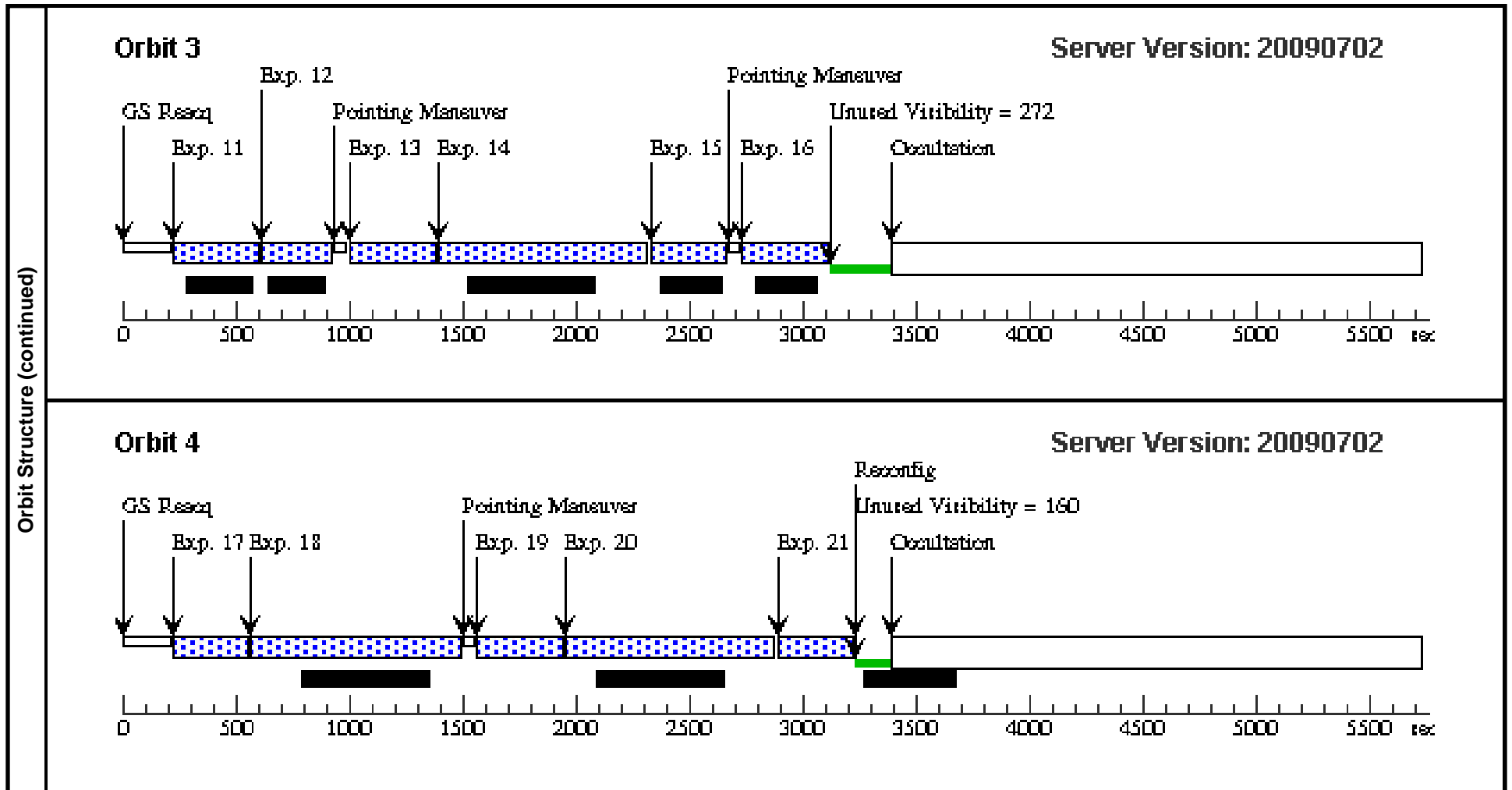
Visit	<b>Proposal 11708, Visit 04, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/IR Special Requirements: PCS MODE FINE; SAME ORIENT AS 02 Comments: Similar visit to Westerlund 1 as for visit 2: The differences are: Two positions in the mosaic are targeted: Position one centered at (55,55) and position two centered at (55,-55). The first position is visited 4 times and the second three times.																		
	Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>CL-WESTERLUND1</td> <td>RA: 16 47 4.0000 (251.7666667d) Dec: -45 50 42.00 (-45.84500d) Equinox: J2000</td> <td></td> <td>V=12</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td colspan="6">Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</td> </tr> </tbody> </table>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	CL-WESTERLUND1	RA: 16 47 4.0000 (251.7666667d) Dec: -45 50 42.00 (-45.84500d) Equinox: J2000		V=12	Reference Frame: ICRS	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.				
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous														
(1)	CL-WESTERLUND1	RA: 16 47 4.0000 (251.7666667d) Dec: -45 50 42.00 (-45.84500d) Equinox: J2000		V=12	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	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 53,53		[==>]	[1]										
	2	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 1		[==>]	[1]										
	3	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 1		[==>]	[1]										
	4	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 55,-55		[==>]	[1]										
	5	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 4		[==>]	[1]										
	6	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 4		[==>]	[2]										
	7	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 57,57		[==>]	[2]										
	8	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 7		[==>]	[2]										
	9	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 7		[==>]	[2]										

Proposal 11708 - Visit 04 - Determining the Sub-stellar IMF in the Most Massive Young Milky Way Cluster, Westerlund 1

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
10		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	POS TARG 57,-57		[==>]	[2]
11		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	SAME POS AS 10		[==>]	[3]
12		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 10		[==>]	[3]
13		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 58,54		[==>]	[3]
14		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 13		[==>]	[3]
15		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 13		[==>]	[3]
16		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 53,-53		[==>]	[3]
17		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 16		[==>]	[4]
18		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 16		[==>]	[4]
19		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 54,58		[==>]	[4]
20		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 19		[==>]	[4]
21		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 19		[==>]	[4]

Exposures (continued)





Proposal 11708 - Visit 05 - Determining the Sub-stellar IMF in the Most Massive Young Milky Way Cluster, Westerlund 1

Tue Oct 06 01:02:29 GMT 2009

Visit	<b>Proposal 11708, Visit 05, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/IR Special Requirements: PCS MODE FINE; SAME ORIENT AS 02 Comments: Similar visit to Westerlund 1 as for visit 2: The differences are: Two positions in the mosaic are targeted: Position one centered at (55,-55) and position two centered at (-55,-55). The first position is visited 4 times and the second three times.																		
	Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>CL-WESTERLUND1</td> <td>RA: 16 47 4.0000 (251.7666667d) Dec: -45 50 42.00 (-45.84500d) Equinox: J2000</td> <td></td> <td>V=12</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td colspan="6">Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</td> </tr> </tbody> </table>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	CL-WESTERLUND1	RA: 16 47 4.0000 (251.7666667d) Dec: -45 50 42.00 (-45.84500d) Equinox: J2000		V=12	Reference Frame: ICRS	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.				
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous														
(1)	CL-WESTERLUND1	RA: 16 47 4.0000 (251.7666667d) Dec: -45 50 42.00 (-45.84500d) Equinox: J2000		V=12	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	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 53,-57		[==>]	[1]										
	2	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 1		[==>]	[1]										
	3	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 1		[==>]	[1]										
	4	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -53,-53		[==>]	[1]										
	5	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 4		[==>]	[1]										
	6	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 4		[==>]	[2]										
	7	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 57,-53		[==>]	[2]										
	8	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 7		[==>]	[2]										
	9	(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 7		[==>]	[2]										

Proposal 11708 - Visit 05 - Determining the Sub-stellar IMF in the Most Massive Young Milky Way Cluster, Westerlund 1

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
10		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	POS TARG -52,-56		[==>]	[2]
11		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	SAME POS AS 10		[==>]	[3]
12		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 10		[==>]	[3]
13		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 58,-56		[==>]	[3]
14		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 13		[==>]	[3]
15		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 13		[==>]	[3]
16		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG -52,-56		[==>]	[3]
17		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 16		[==>]	[4]
18		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 16		[==>]	[4]
19		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=STEP5 0	POS TARG 55,-52		[==>]	[4]
20		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F139M	NSAMP=15; SAMP-SEQ=STEP1 00	SAME POS AS 19		[==>]	[4]
21		(1) CL-WESTERLU ND1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=11; SAMP-SEQ=STEP5 0	SAME POS AS 19		[==>]	[4]

Exposures (continued)

