



10566 - Star Formation in the LMC - The complete IMF of a Stellar Association

Cycle: 14, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets</i>	<i>Configurations</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	ANY (1) STAR-CLUS-053707-662203	ACS/WFC NIC2	3	20-Jun-2005 11:40:00.0	yes
02	ANY (1) STAR-CLUS-053707-662203	ACS/WFC NIC2	3	20-Jun-2005 11:40:18.0	yes
03	ANY (2) FIELD-053614-662143	ACS/WFC NIC2	2	20-Jun-2005 11:40:31.0	yes
04	ANY (2) FIELD-053614-662143	ACS/WFC NIC2	2	20-Jun-2005 11:40:37.0	yes

10 Total Orbits Used

ABSTRACT

We propose to use the large improvement in sensitivity and wide-field resolution provided by ACS to obtain, for the first time, the complete Initial Mass Function (IMF) down to sub-solar masses of a very young stellar association in the Large Magellanic Cloud (LMC). Such an IMF will serve as a reference IMF typical of low-metallicity regions. We want to obtain VI deep ($V \sim 26.5$ mag) WFC photometry of the association LH 95 and a nearby background field pointing. Special care will be taken to treat all the complications which arise in the reduction of data for the purpose of calculating the IMF of a young association of stars. Our object of study has been chosen because it is one of the associations, which provide the best combination of spatial resolution, crowding, low extinction, nebular contamination, and background confusion in comparison to others in the Local Group. The region also has the advantage of being very young with indications that it is still forming stars, thus allowing us to search for sub-solar pre-main-sequence stars, as well as for an embedded proto-cluster.

OBSERVING DESCRIPTION

We require ACS/WFC imaging of two fields, the first centered on the association LH 95 (System) and the second on an area located 5.3 arcmin west from the first (Field). The selection of WFC is based on the fact that associations are elongated stellar systems covering few arcminutes of sky, requiring a wide field of view with high spatial resolution. Two broad-band filters will be used: F555W and F814W which are equivalent to Johnson-Cousins V and I respectively. Our analysis of both the fields to be observed has been done with a nominal S/N ~ 20 at $V \sim 26.5$ mag and $I \sim 25.5$ mag, assuming a flat continuum, as well as spectral distributions of late-type main-sequence stars down to M0. To reach S/N=20 at this magnitude, total exposure times of about 3,000 sec in F555W and about 2,000 sec in F814W are needed for each field with the WFC. Dithered observations using a sub-pixel box pointing pattern will be performed. We will also take parallel observations with NICMOS (NIC2) in F110W, F160W and F205W bands.

Four visits are required, two for each field. For the System we will perform short exposures of 75 sec in F555W and F814W, as well as long ones of 1250 sec in both filters. Long exposures will be performed within a LINE dither pattern to bridge the gap between the detectors and a LINE dither subpattern for hot pixels and cosmic rays corrections. In addition one exposure of 50 sec per filter will be performed. This provides 4×1250 sec = 5000 sec plus 200 sec ($2 \times 75 + 1 \times 50$ sec) in F555W and F814W for the System. For the Field a LINE dither pattern with a LINE dither subpattern

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will be also used, within which exposures of 1250 sec in F555W and F814W will be done. This gives 5000 sec in F555W and F814W for the Field. The consideration of the guide star acquisition times, the instrument overhead times, and the overheads for telescope repositioning, for our exposures results to one set of 3 orbits for the observations in each filter for the System and a set of 2 orbits for the ones in each filter for the Field. Each set will make up a visit. Consequently, in total four visits containing 10 orbits will be performed.

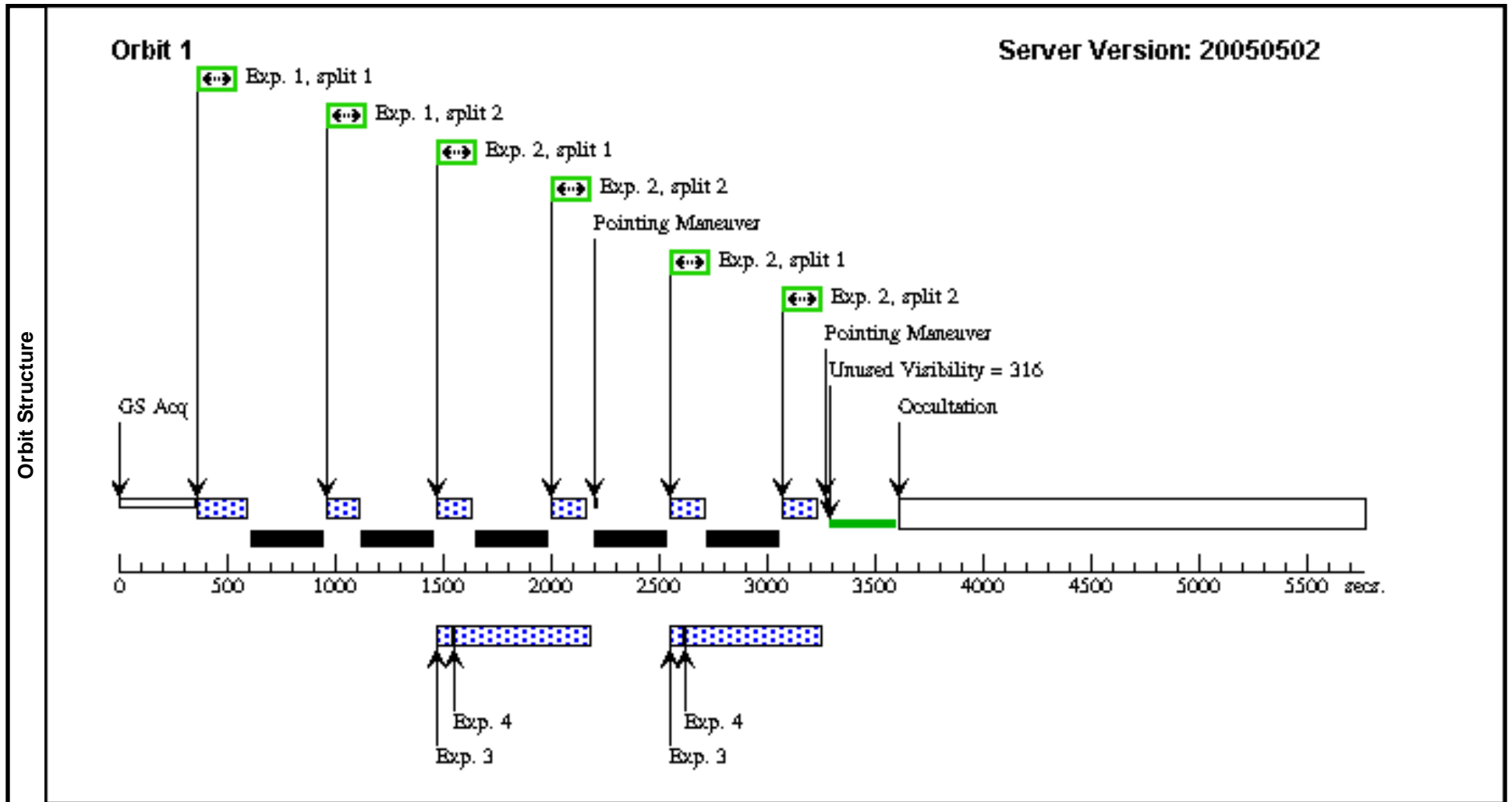
Proposal 10566 - Visit 01 - Star Formation in the LMC - The complete IMF of a Stellar Association

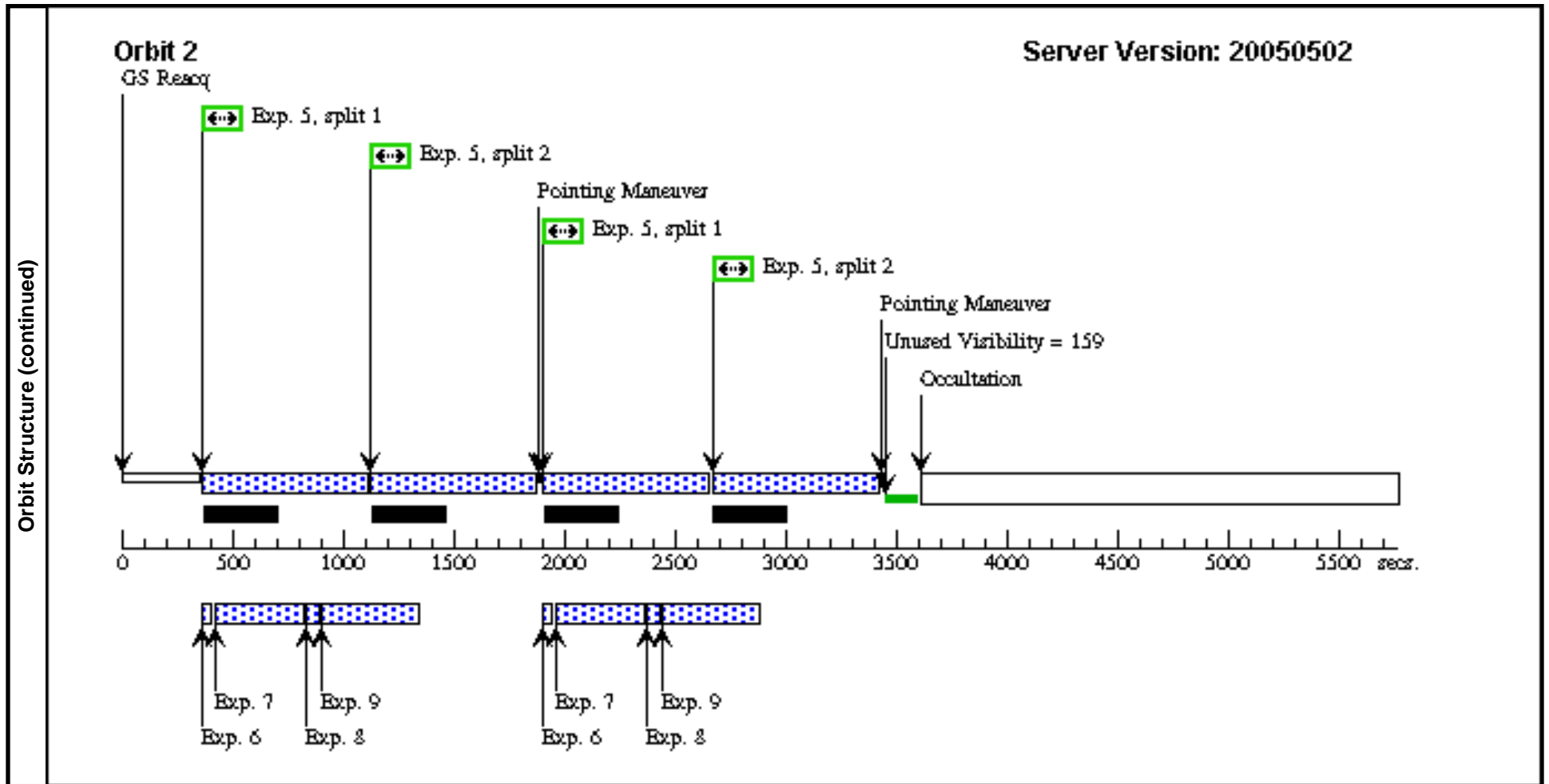
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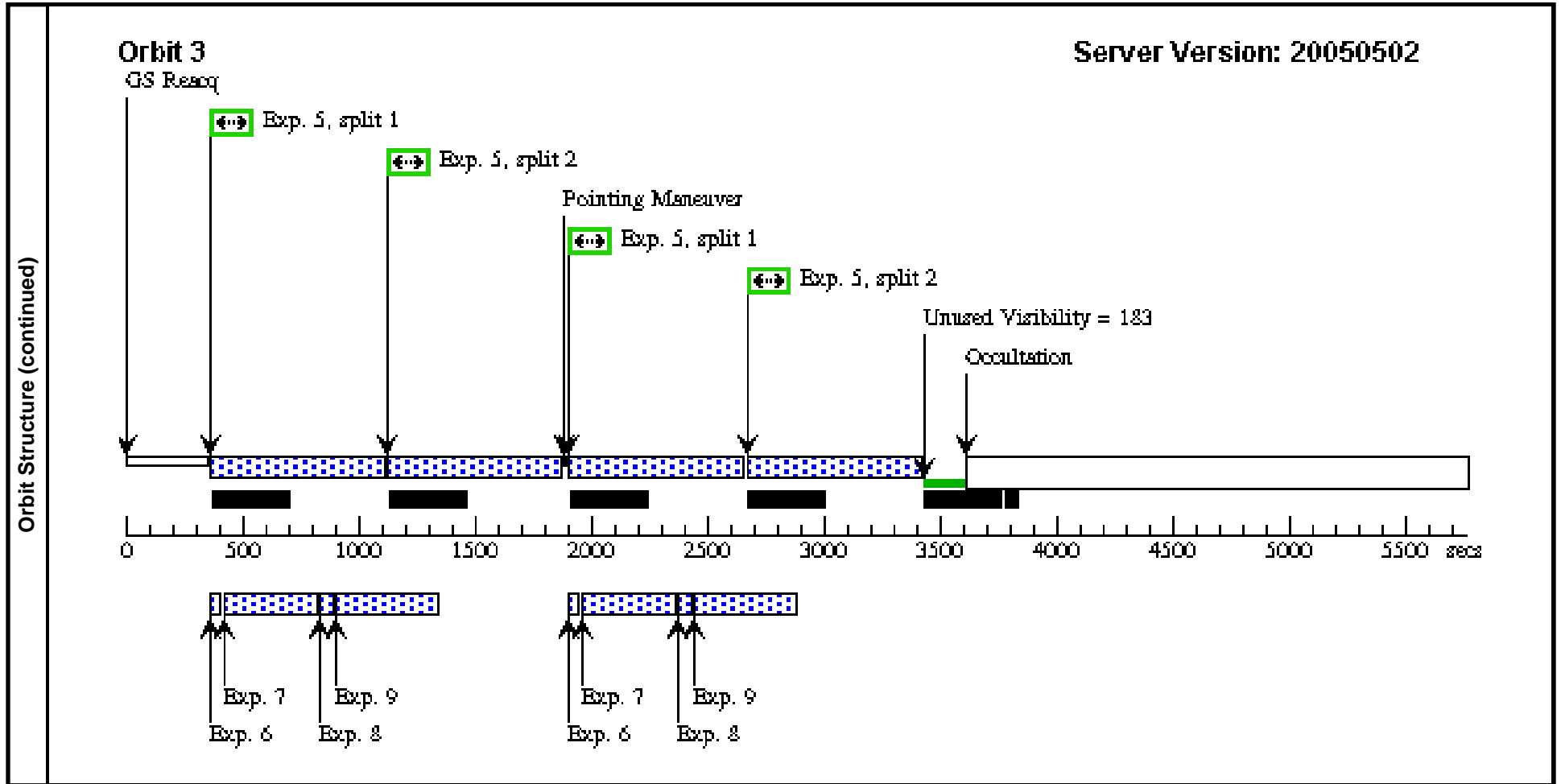
Visit	Proposal 10566, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC, NIC2 Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.3 Angle Between Sides= Center Pattern=false	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.2 Angle Between Sides= Center Pattern=false	(5-9)			
	(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.3 Angle Between Sides= Center Pattern=false			(2-4)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	STAR-CLUS-053707-662203 Alt Name1: LH95-SYSTEM	RA: 05 37 6.5000 (84.2770833d) Dec: -66 22 3.50 (-66.36764d) Equinox: J2000 Plate Id: (?)		V=26.5+/-0.5 E(B-V) = 0.2 +/- 0.1	Coordinate Source: SuperCOSMOS Image (1.2m UKST Plate)				
<i>Comments: Target coordinates have been defined on the UKST Plate (from SuperCOSMOS Survey) with the use of CDS Aladin. Since the target is extended, there is no need for high accuracy in the specification of its coordinates for imaging and, thus, for the use of GSC.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	S_F555W_0 50_1_2	(1) STAR-CLUS-05 3707-662203	ACS/WFC, ACCUM, WFC	F555W				50.0 Secs [==>(Split 1)] [==>(Split 2)]	[1]
	2	S_F555W_0 75_1_2	(1) STAR-CLUS-05 3707-662203	ACS/WFC, ACCUM, WFC	F555W			Pattern 2-4 (2) Prime + Parallel Group 2-4	75.0 Secs [==>(Pattern 1, Split 1)] [==>(Pattern 1, Split 2)] [==>(Pattern 2, Split 1)] [==>(Pattern 2, Split 2)]	[1]
	3	A_F205W_0 050_1_2	ANY	NIC2, ACCUM, NIC2	F205W			Pattern 2-4 (2) Prime + Parallel Group 2-4	50.0 Secs [==>(Pattern 1)] [==>(Pattern 2)]	[1]
	4	A_F205W_0 670_1_2	ANY	NIC2, ACCUM, NIC2	F205W			Pattern 2-4 (2) Prime + Parallel Group 2-4	670.0 Secs [==>(Pattern 1)] [==>(Pattern 2)]	[1]

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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
Exposures (continued)	5	S_F555W_1 250_1_1	(1) STAR-CLUS-05 3707-662203	ACS/WFC, ACCUM, WFC	F555W		Pattern 5-9 (1) Prime + Parallel Gro up 5-9	1250.0 Secs	
								[==>(Pattern 1,1, Split 1)]	[2]
								[==>(Pattern 1,1, Split 2)]	
								[==>(Pattern 1,2, Split 1)]	[3]
								[==>(Pattern 1,2, Split 2)]	
								[==>(Pattern 2,1, Split 1)]	[3]
	[==>(Pattern 2,1, Split 2)]								
	[==>(Pattern 2,2, Split 1)]	[3]							
	[==>(Pattern 2,2, Split 2)]								
	6	A_F110W_ 030_1_1	ANY	NIC2, ACCUM, NIC2	F110W		Pattern 5-9 (1) Prime + Parallel Gro up 5-9	30.0 Secs	
								[==>(Pattern 1,1)]	[2]
								[==>(Pattern 1,2)]	
[==>(Pattern 2,1)]								[3]	
[==>(Pattern 2,2)]									
7								A_F110W_ 400_1_1	ANY
	[==>(Pattern 1,1)]	[2]							
	[==>(Pattern 1,2)]								
	[==>(Pattern 2,1)]	[3]							
	[==>(Pattern 2,2)]								
	8	A_F160W_ 045_1_1	ANY	NIC2, ACCUM, NIC2	F160W		Pattern 5-9 (1) Prime + Parallel Gro up 5-9		
[==>(Pattern 1,1)]								[2]	
[==>(Pattern 1,2)]									
[==>(Pattern 2,1)]								[3]	
[==>(Pattern 2,2)]									
9								A_F160W_ 475_1_1	ANY
	[==>(Pattern 1,1)]	[2]							
	[==>(Pattern 1,2)]								
	[==>(Pattern 2,1)]	[3]							
	[==>(Pattern 2,2)]								







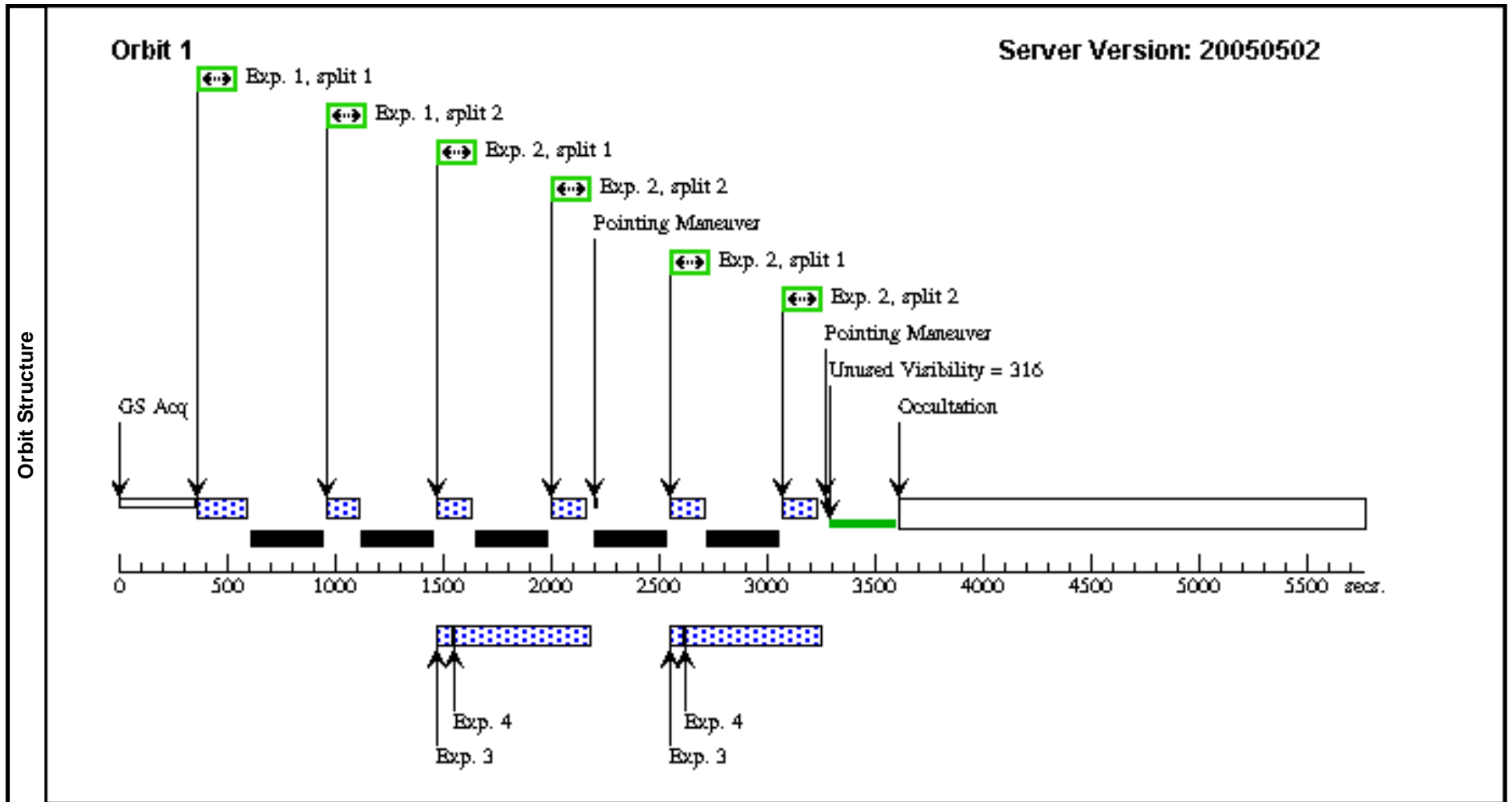
Proposal 10566 - Visit 02 - Star Formation in the LMC - The complete IMF of a Stellar Association

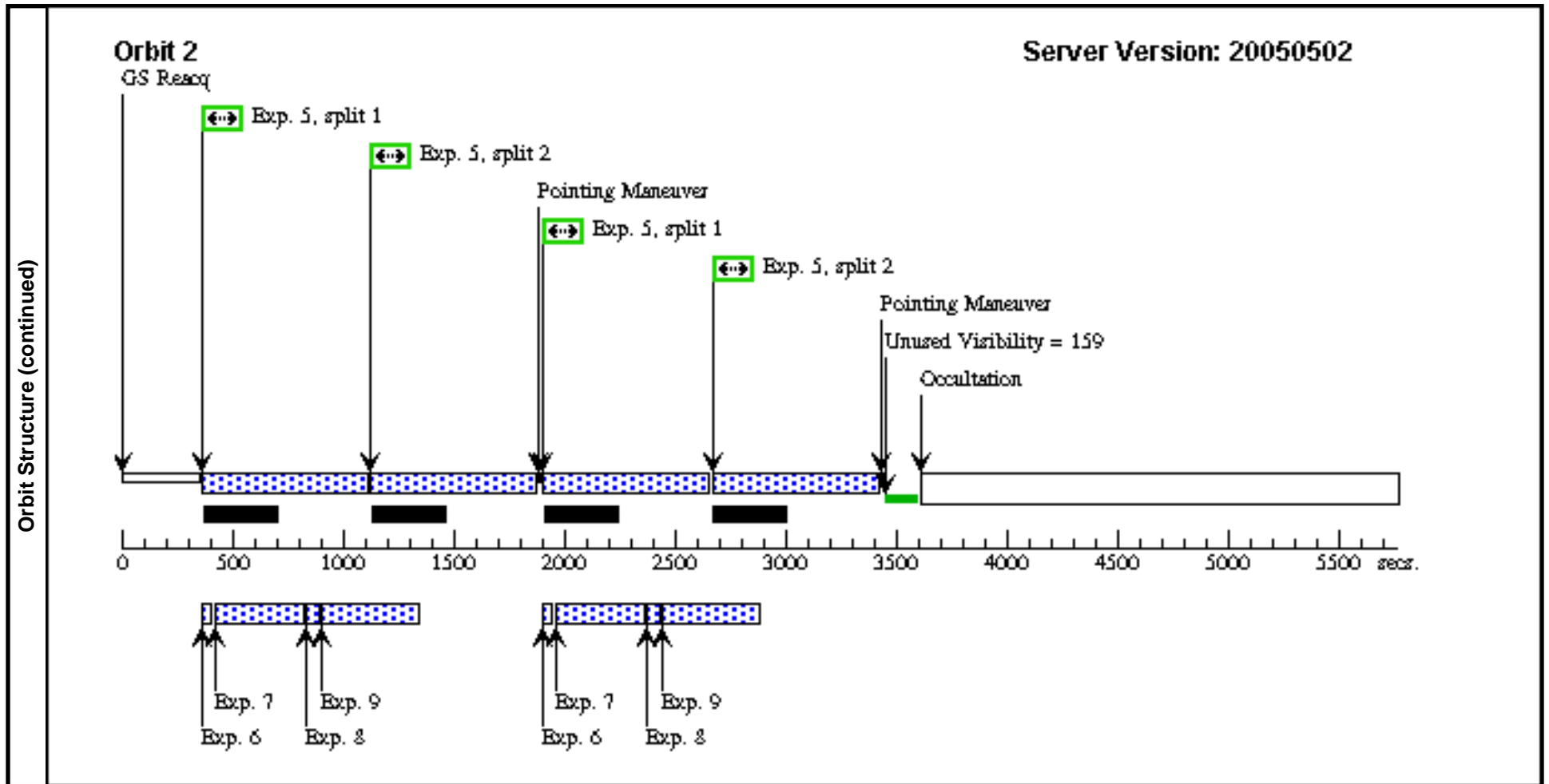
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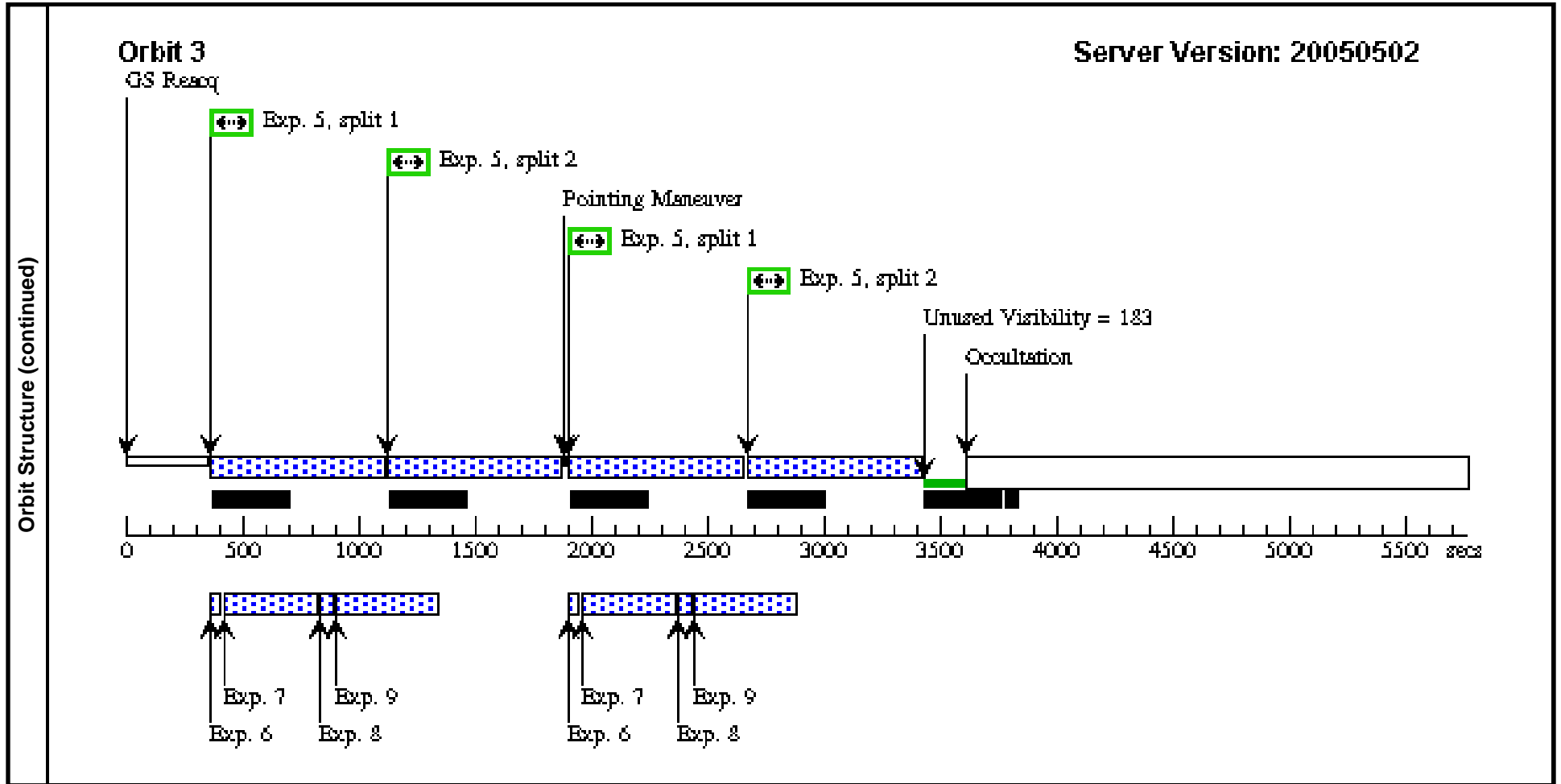
Visit	Proposal 10566, Visit 02 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC, NIC2 Special Requirements: SAME ORIENT AS 01									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.3 Angle Between Sides= Center Pattern=false	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.2 Angle Between Sides= Center Pattern=false	(5-9)			
	(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.3 Angle Between Sides= Center Pattern=false			(2-4)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	STAR-CLUS-053707-662203 Alt Name1: LH95-SYSTEM	RA: 05 37 6.5000 (84.2770833d) Dec: -66 22 3.50 (-66.36764d) Equinox: J2000 Plate Id: (?)		V=26.5+/-0.5 E(B-V) = 0.2 +/- 0.1	Coordinate Source: SuperCOSMOS Image (1.2m UKST Plate)				
<i>Comments: Target coordinates have been defined on the UKST Plate (from SuperCOSMOS Survey) with the use of CDS Aladin. Since the target is extended, there is no need for high accuracy in the specification of its coordinates for imaging and, thus, for the use of GSC.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	S_F814W_050_1_2	(1) STAR-CLUS-053707-662203	ACS/WFC, ACCUM, WFC	F814W				50.0 Secs [=>(Split 1)] [=>(Split 2)]	[1]
	2	S_F814W_075_1_2	(1) STAR-CLUS-053707-662203	ACS/WFC, ACCUM, WFC	F814W			Pattern 2-4 (2) Prime + Parallel Group 2-4	75.0 Secs [=>(Pattern 1, Split 1)] [=>(Pattern 1, Split 2)] [=>(Pattern 2, Split 1)] [=>(Pattern 2, Split 2)]	[1]
	3	A_F205W_050_1_2	ANY	NIC2, ACCUM, NIC2	F205W			Pattern 2-4 (2) Prime + Parallel Group 2-4	50.0 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	4	A_F205W_650_1_2	ANY	NIC2, ACCUM, NIC2	F205W			Pattern 2-4 (2) Prime + Parallel Group 2-4	650.0 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]

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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
Exposures (continued)	5	S_F814W_1 250_1_1	(1) STAR-CLUS-05 3707-662203	ACS/WFC, ACCUM, WFC	F814W		Pattern 5-9 (1) Prime + Parallel Gro up 5-9	1250.0 Secs	
								[==>(Pattern 1,1, Split 1)]	[2]
								[==>(Pattern 1,1, Split 2)]	
								[==>(Pattern 1,2, Split 1)]	
								[==>(Pattern 1,2, Split 2)]	
								[==>(Pattern 2,1, Split 1)]	[3]
	[==>(Pattern 2,1, Split 2)]								
	[==>(Pattern 2,2, Split 1)]								
	[==>(Pattern 2,2, Split 2)]								
	6	A_F110W_ 030_1_1	ANY	NIC2, ACCUM, NIC2	F110W		Pattern 5-9 (1) Prime + Parallel Gro up 5-9	30.0 Secs	
								[==>(Pattern 1,1)]	[2]
								[==>(Pattern 1,2)]	
[==>(Pattern 2,1)]	[3]								
[==>(Pattern 2,2)]									
7	A_F110W_ 400_1_1	ANY	NIC2, ACCUM, NIC2	F110W		Pattern 5-9 (1) Prime + Parallel Gro up 5-9	400.0 Secs		
							[==>(Pattern 1,1)]	[2]	
							[==>(Pattern 1,2)]		
[==>(Pattern 2,1)]	[3]								
[==>(Pattern 2,2)]									
8	A_F160W_ 045_1_1	ANY	NIC2, ACCUM, NIC2	F160W		Pattern 5-9 (1) Prime + Parallel Gro up 5-9	45.0 Secs		
							[==>(Pattern 1,1)]	[2]	
							[==>(Pattern 1,2)]		
[==>(Pattern 2,1)]	[3]								
[==>(Pattern 2,2)]									
9	A_F160W_ 475_1_1	ANY	NIC2, ACCUM, NIC2	F160W		Pattern 5-9 (1) Prime + Parallel Gro up 5-9	475.0 Secs		
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							[==>(Pattern 1,2)]		
[==>(Pattern 2,1)]	[3]								
[==>(Pattern 2,2)]									







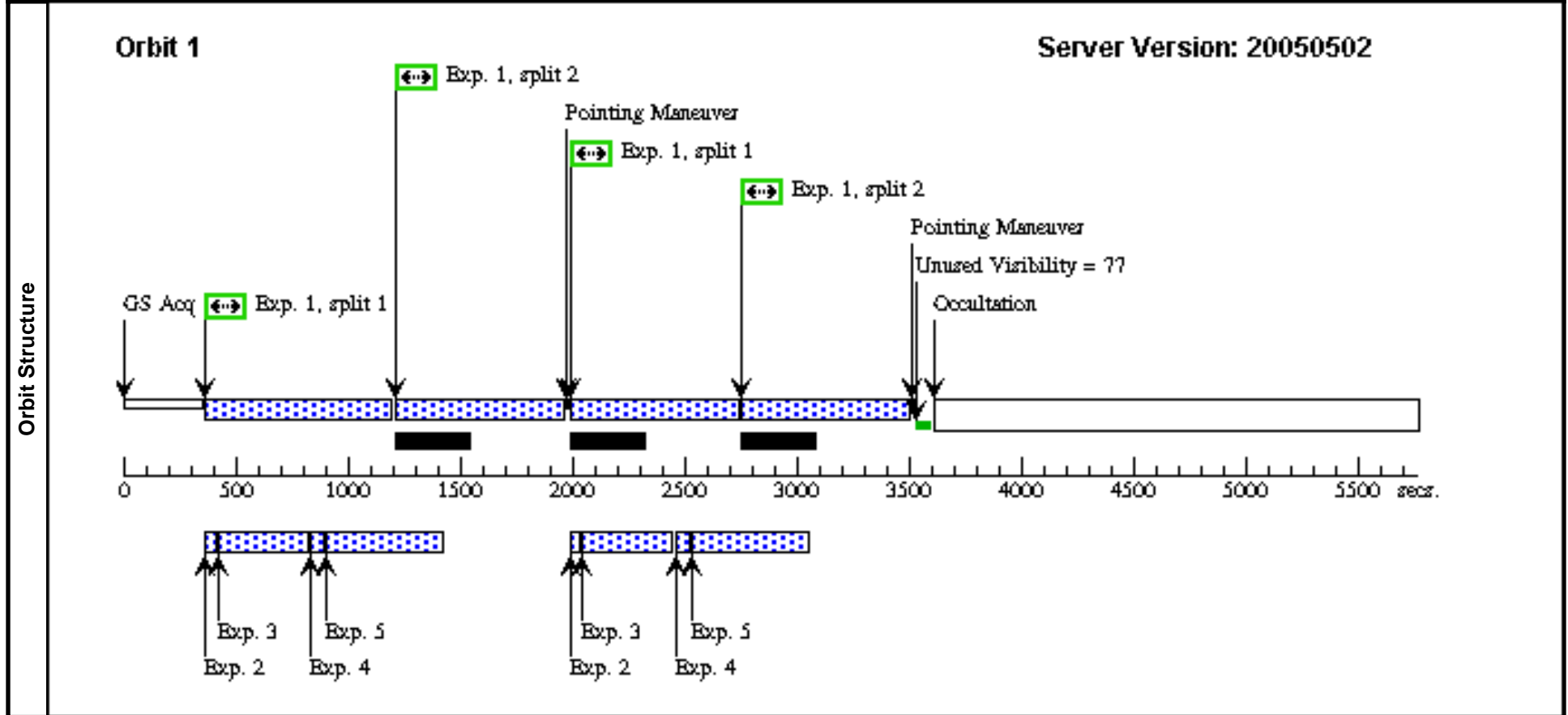
Proposal 10566 - Visit 03 - Star Formation in the LMC - The complete IMF of a Stellar Association

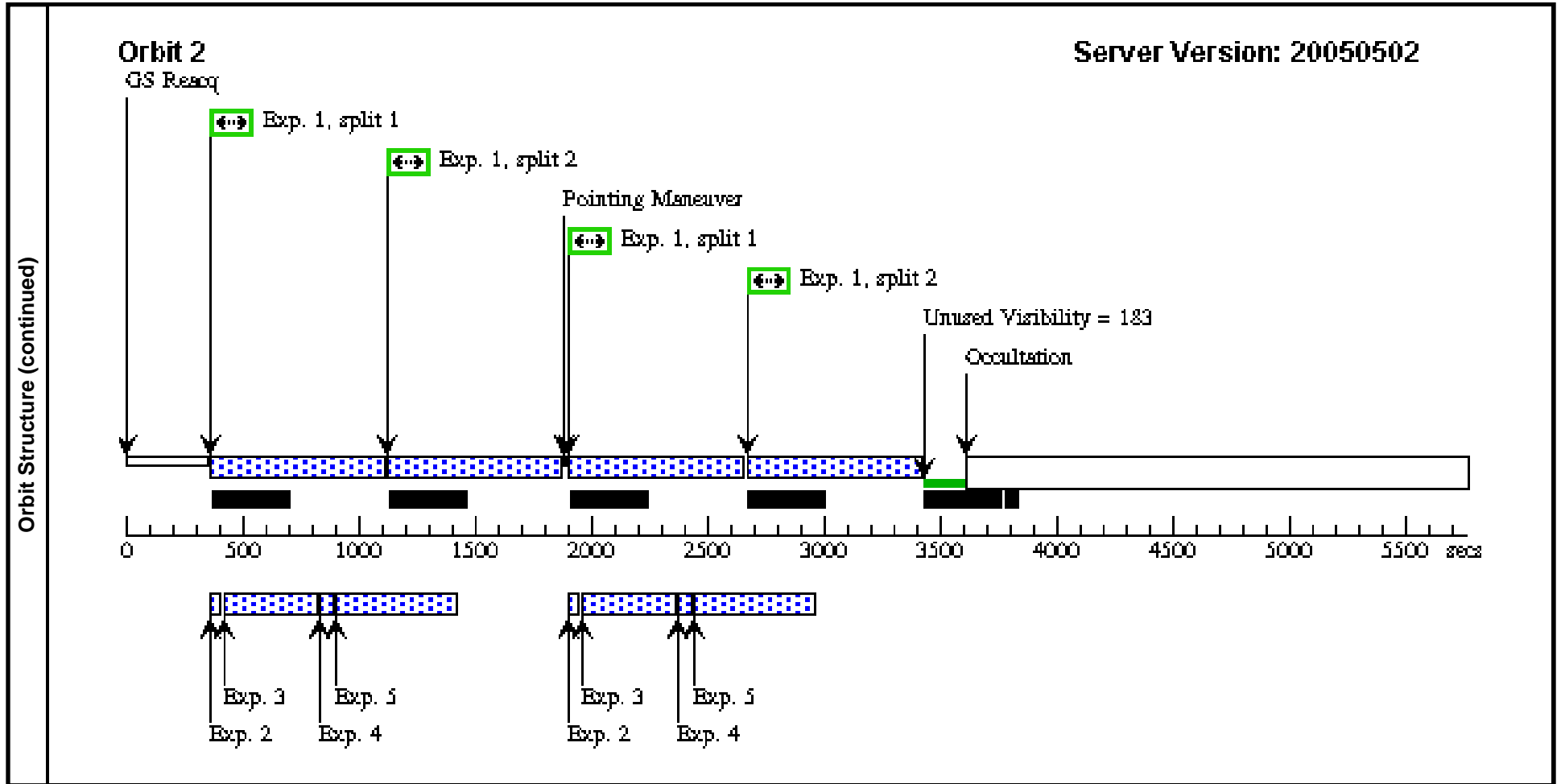
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Visit	Proposal 10566, Visit 03 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC, NIC2 Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.3 Angle Between Sides= Center Pattern=false	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.2 Angle Between Sides= Center Pattern=false	(1-5)			
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	FIELD-053614-662143 Alt Name1: LH95-FIELD	RA: 05 36 14.0000 (84.0583333d) Dec: -66 21 43.50 (-66.36208d) Equinox: J2000 Plate Id: (?)		V=26.5+/-0.5 E(B-V) = 0.1 +/- 0.05	Coordinate Source: SuperCOSMOS Image (1.2m UKST Plate)				
<i>Comments: Target coordinates have been defined on the UKST Plate (from SuperCOSMOS Survey) with the use of CDS Aladin. Since the target is extended, there is no need for high accuracy in the specification of its coordinates for imaging and, thus, for the use of GSC.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F_F555W_1 250_3_1	(2) FIELD-053614-6 62143	ACS/WFC, ACCUM, WFC	F555W				Pattern 1-5 (1) Prime + Parallel Gro up 1-5	1250.0 Secs [==>(Pattern 1,1, Split 1)] [==>(Pattern 1,1, Split 2)] [==>(Pattern 1,2, Split 1)] [==>(Pattern 1,2, Split 2)] [==>(Pattern 2,1, Split 1)] [==>(Pattern 2,1, Split 2)] [==>(Pattern 2,2, Split 1)] [==>(Pattern 2,2, Split 2)]
2	A_F110W_ 030_3_1	ANY		NIC2, ACCUM, NIC2	F110W			Pattern 1-5 (1) Prime + Parallel Gro up 1-5	30.0 Secs [==>(Pattern 1,1)] [==>(Pattern 1,2)] [==>(Pattern 2,1)] [==>(Pattern 2,2)]	[1] [2]
3	A_F110W_ 400_3_1	ANY		NIC2, ACCUM, NIC2	F110W			Pattern 1-5 (1) Prime + Parallel Gro up 1-5	400.0 Secs [==>(Pattern 1,1)] [==>(Pattern 1,2)] [==>(Pattern 2,1)] [==>(Pattern 2,2)]	[1] [2]

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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
4	A_F160W_045_3_1	ANY	NIC2, ACCUM, NIC2	F160W			Pattern 1-5 (1) Prime + Parallel Group 1-5	45.0 Secs	
								[=>(Pattern 1,1)]	[1]
								[=>(Pattern 1,2)]	[2]
								[=>(Pattern 2,1)]	
5	A_F160W_570_3_1	ANY	NIC2, ACCUM, NIC2	F160W			Pattern 1-5 (1) Prime + Parallel Group 1-5	570.0 Secs	
								[=>(Pattern 1,1)]	[1]
								[=>(Pattern 1,2)]	[2]
								[=>(Pattern 2,1)]	





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Visit	Proposal 10566, Visit 04 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC, NIC2 Special Requirements: SAME ORIENT AS 03									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.3 Angle Between Sides= Center Pattern=false	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.2 Angle Between Sides= Center Pattern=false	(1-3)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	FIELD-053614-662143 Alt Name1: LH95-FIELD	RA: 05 36 14.0000 (84.0583333d) Dec: -66 21 43.50 (-66.36208d) Equinox: J2000 Plate Id: (?)		V=26.5+/-0.5 E(B-V) = 0.1 +/- 0.05	Coordinate Source: SuperCOSMOS Image (1.2m UKST Plate)				
<i>Comments: Target coordinates have been defined on the UKST Plate (from SuperCOSMOS Survey) with the use of CDS Aladin. Since the target is extended, there is no need for high accuracy in the specification of its coordinates for imaging and, thus, for the use of GSC.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F_F814W_1 250_4_1	(2) FIELD-053614-662143	ACS/WFC, ACCUM, WFC	F814W				Pattern 1-3 (1) Prime + Parallel Group 1-3	1250.0 Secs [==>(Pattern 1,1, Split 1)] [==>(Pattern 1,1, Split 2)] [==>(Pattern 1,2, Split 1)] [==>(Pattern 1,2, Split 2)] [==>(Pattern 2,1, Split 1)] [==>(Pattern 2,1, Split 2)] [==>(Pattern 2,2, Split 1)] [==>(Pattern 2,2, Split 2)]
2	A_F205W_1 050_4_1	ANY		NIC2, ACCUM, NIC2	F205W			Pattern 1-3 (1) Prime + Parallel Group 1-3	50.0 Secs [==>(Pattern 1,1)] [==>(Pattern 1,2)] [==>(Pattern 2,1)] [==>(Pattern 2,2)]	[1] [2]
3	A_F205W_1 900_4_1	ANY		NIC2, ACCUM, NIC2	F205W			Pattern 1-3 (1) Prime + Parallel Group 1-3	900.0 Secs [==>(Pattern 1,1)] [==>(Pattern 1,2)] [==>(Pattern 2,1)] [==>(Pattern 2,2)]	[1] [2]

