



12877 - Exposing the Maffei Group

Cycle: 20, 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	(1) MAFFEI-1 ANY	ACS/WFC WFC3/IR	1	05-Jul-2012 21:06:58.0	yes
02	(1) MAFFEI-1 ANY	ACS/WFC WFC3/IR	1	05-Jul-2012 21:07:08.0	yes
03	(2) MAFFEI-2 ANY	ACS/WFC WFC3/IR	1	05-Jul-2012 21:07:17.0	yes

<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>
04	(2) MAFFEI-2 ANY	ACS/WFC WFC3/IR	1	05-Jul-2012 21:07:25.0	yes
05	(8) IC-0342 ANY	ACS/WFC WFC3/IR	1	05-Jul-2012 21:07:32.0	yes
06	(8) IC-0342 ANY	ACS/WFC WFC3/IR	1	05-Jul-2012 21:07:39.0	yes

6 Total Orbits Used

ABSTRACT

Accurate distances can be determined for nearby galaxies from the luminosities of stars at the Tip of the Red Giant Branch (TRGB). There is now detailed information on the distribution of galaxies within 4 Mpc at high Galactic latitudes. Radial velocities are known to a few km/s from HI observations and distance measurement with 6% accuracy permit the parsing of peculiar velocities from the cosmic expansion at the level of 15 km/s. Dynamic models of the region within 4 Mpc are becoming increasingly sophisticated with the result that our understanding of the distribution of matter is increasingly detailed. However there is a problem. The greatest tidal influence on the Local Group comes from the Maffei - IC342 complex at low Galactic latitudes and its members are heavily obscured. We need to know the distances and masses of the members of this complex in order to accurately reconstruct the orbital history and map the mass distribution of the Local Group. There has been limited success studying the Maffei region with observations shortward of 1 micron but accurate distances can be obtained with observations in the infrared. The TRGB is extremely bright in the infrared and obscuration is not such a problem. Three important and heavily obscured objects requiring two orbits each will be observed with WFC3/IR through the F110W and F160W filters. Parallel observations with ACS through the F814W and F606W filters will contribute to an accurate measurement of line-of-sight extinction.

OBSERVING DESCRIPTION

Three principal and highly obscured galaxies in the nearest group: Maffei 1, Maffei 2, and IC 342 will be observed simultaneously with WFC3/IR as primary and ACS/WFC in parallel with two orbits each. The exposures times will be divided between F110W and F160W filters with account for obscuration. We are guided by the exposure times used in the course of program SNAP 11719 (PI Dalcanton) with galaxies at similar distances, though less obscured. All three the galaxies are large, having extinction corrected Holmberg diameters within 12 - 30 arcminutes. We point the WFC3/IR camera about 5-6 arcmin away from the galaxy center in each case. Position of the ACS on the galaxy body may be chosen more or less

arbitrary, simply avoiding crowded HII-regions in the galaxy as well as bright foreground stars.

We follow dithering procedures demonstrated to be optimal for psf reconstruction. The photometry is carried out with the software DOLPHOT, the successor to HSTPHOT (Dolphin 2000), enhanced to be used with WFC3 data.

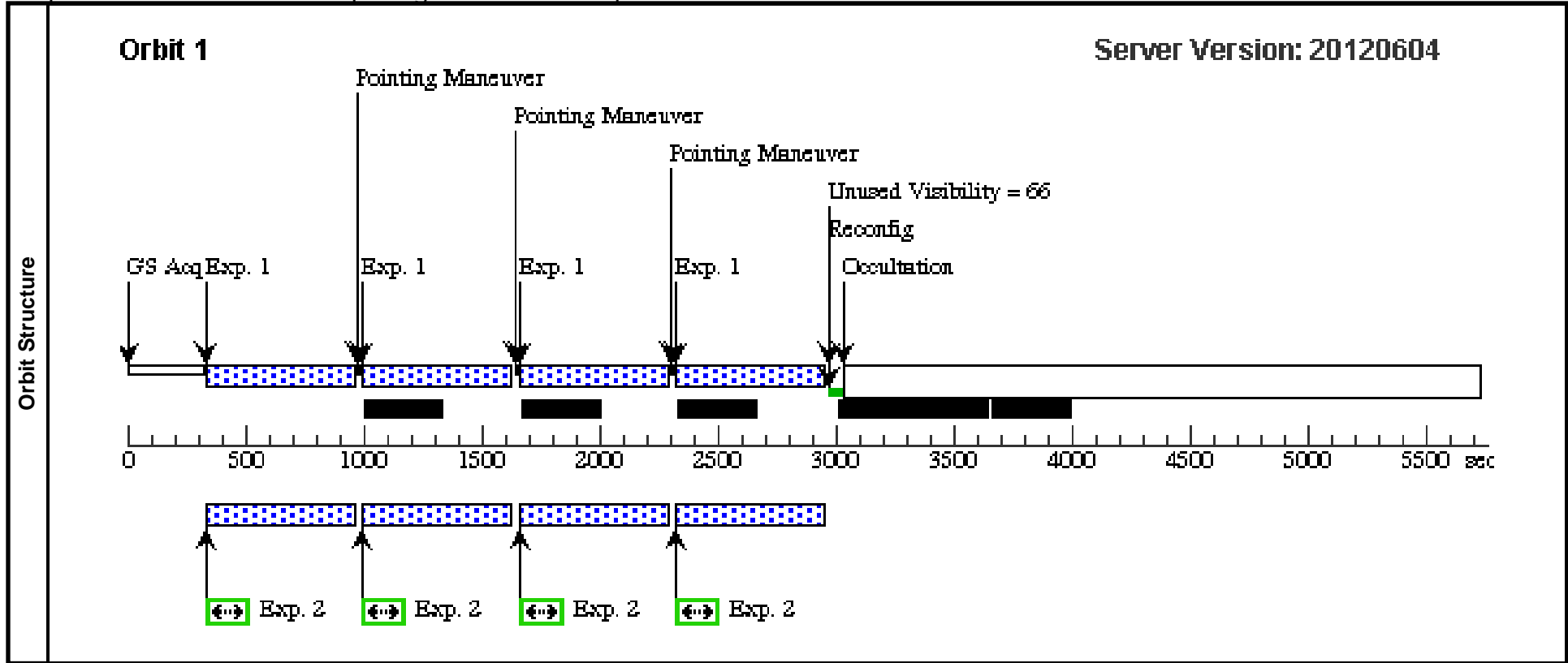
Calibration of the TRGB in the F110W filter is carried out using archival data from SNAP 11719 observations, using the same F110W and F160W filters.

Parallel observations of adjacent fields will be made with ACS through the F814W and F606W filters. The color displacement of the Zero Age Main Sequence will be used to determine the reddening in the line-of-sight.

Proposal 12877 - Visit 01 - Exposing the Maffei Group

Fri Jul 06 01:07:47 GMT 2012

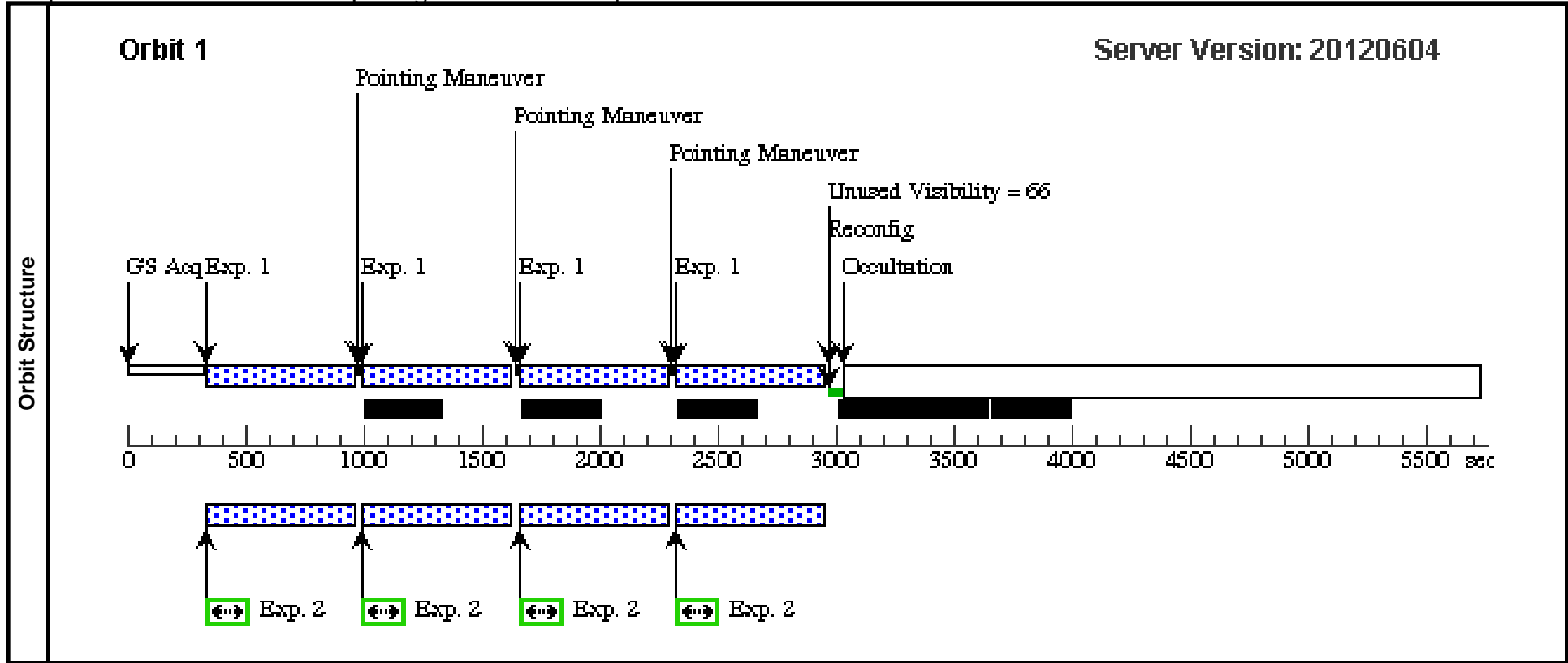
Visit	Proposal 12877, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: SCHED 100%; ORIENT 270D TO 90 D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(3)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=4 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1-2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	MAFFEI-1	RA: 02 36 50.8561 (39.2119004d) Dec: +59 41 30.08 (59.69169d) Equinox: J2000		V=13.47	Reference Frame: ICRS				
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	MAFFEI-1-110W	(1) MAFFEI-1	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=7; SAMP-SEQ=SPAR S100			Pattern 3, Exps 1-2 in Visit 01 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 01	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]
2	MAFFEI-1-F606	ANY	ACS/WFC, ACCUM, WFC1	F606W				Pattern 3, Exps 1-2 in Visit 01 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 01	490 Secs [==>425.0 Secs (Pattern 1)] [==>507.0 Secs (Pattern 2)] [==>507.0 Secs (Pattern 3)] [==>507.0 Secs (Pattern 4)]	[1]



Proposal 12877 - Visit 02 - Exposing the Maffei Group

Fri Jul 06 01:07:49 GMT 2012

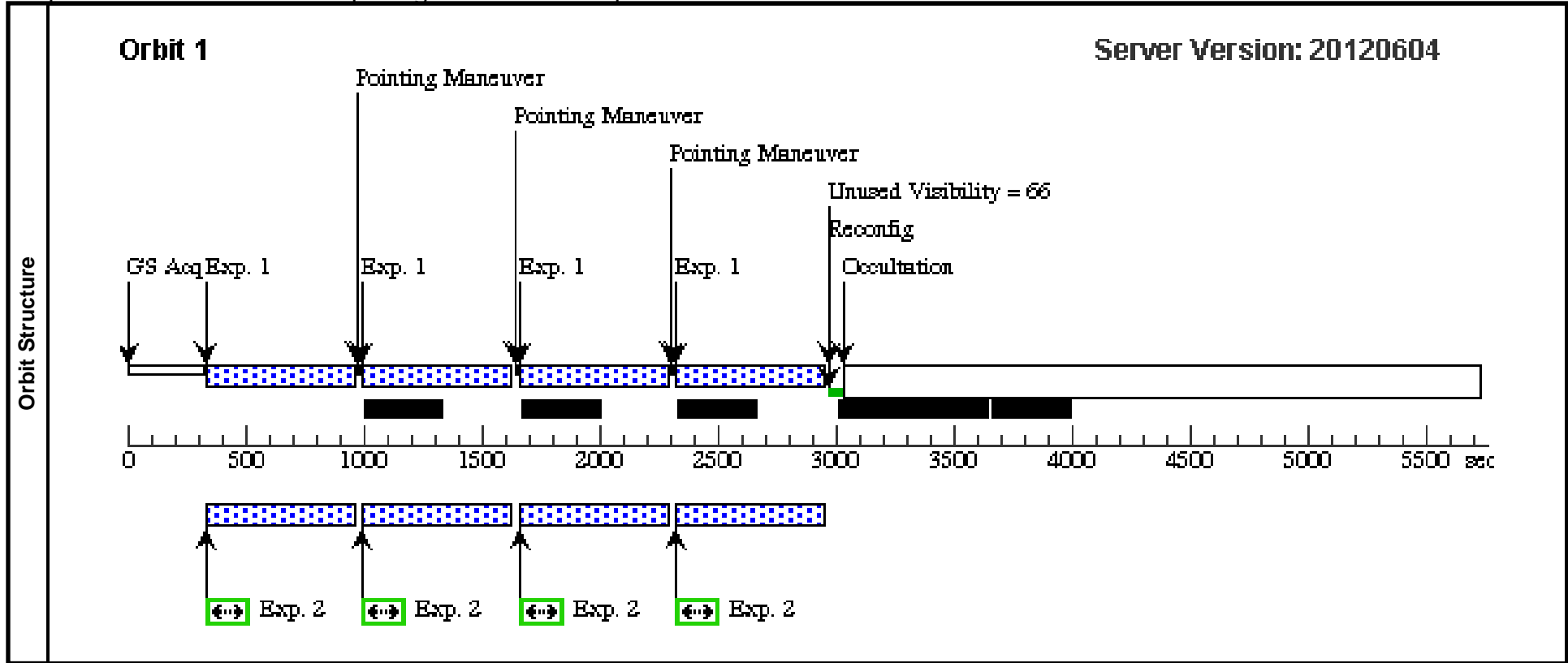
Visit	Proposal 12877, Visit 02 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: SCHED 100%; SAME ORIENT AS 01									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(3)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=4 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1-2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	MAFFEI-1	RA: 02 36 50.8561 (39.2119004d) Dec: +59 41 30.08 (59.69169d) Equinox: J2000		V=13.47	Reference Frame: ICRS				
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	MAFFEI-1-F160	(1) MAFFEI-1	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=7; SAMP-SEQ=SPAR S100			Pattern 3, Exps 1-2 in Visit 02 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 02	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]
2	MAFFEI-1-F814	ANY	ACS/WFC, ACCUM, WFC1	F814W				Pattern 3, Exps 1-2 in Visit 02 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 02	490 Secs [==>425.0 Secs (Pattern 1)] [==>507.0 Secs (Pattern 2)] [==>507.0 Secs (Pattern 3)] [==>507.0 Secs (Pattern 4)]	[1]



Proposal 12877 - Visit 03 - Exposing the Maffei Group

Fri Jul 06 01:07:52 GMT 2012

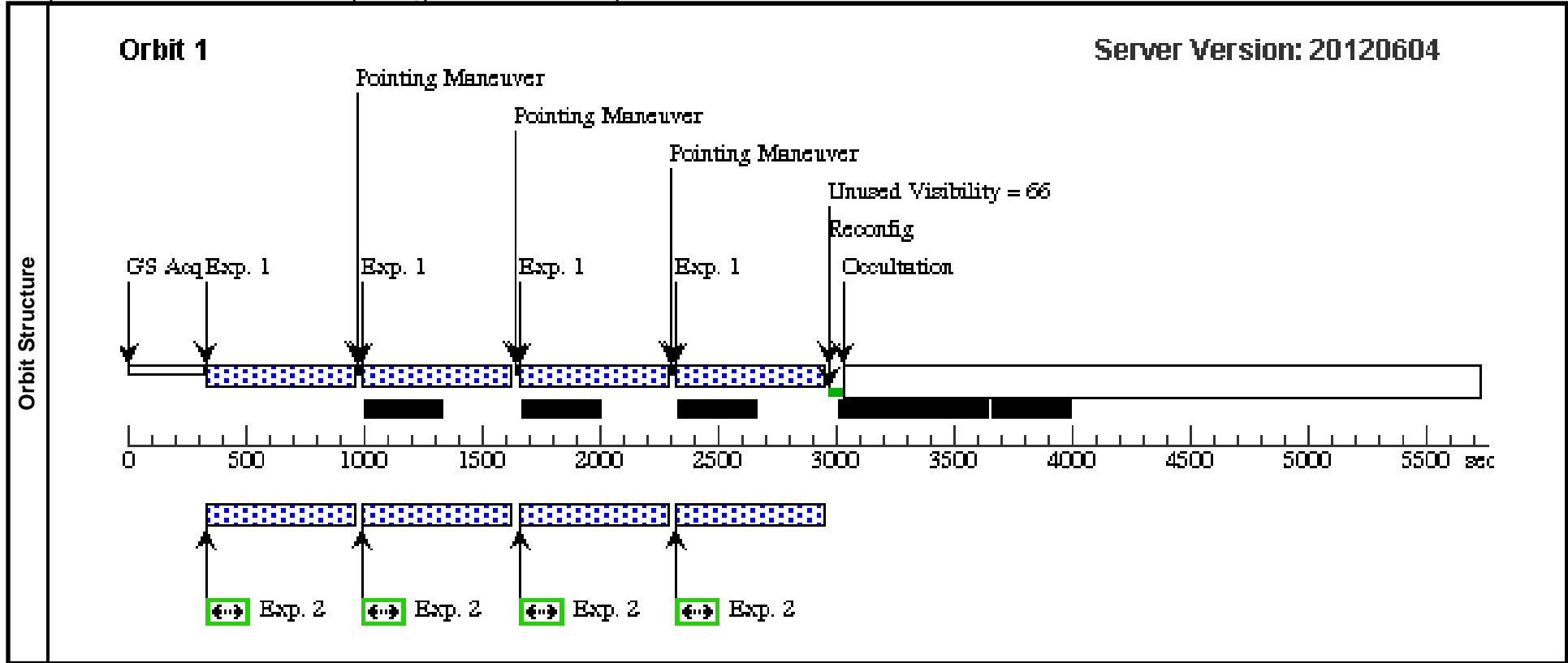
Visit	Proposal 12877, Visit 03 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: SCHED 100%; ORIENT 120D TO 20 D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(3)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=4 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1-2)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	MAFFEI-2	RA: 02 42 19.0298 (40.5792908d) Dec: +59 34 34.63 (59.57629d) Equinox: J2000		V=14.77	Reference Frame: ICRS				
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	MAFFEI-2-110W	(2) MAFFEI-2	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=7; SAMP-SEQ=SPAR S100			Pattern 3, Exps 1-2 in Visit 03 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 03	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]
2	MAFFEI-2-F606	ANY	ACS/WFC, ACCUM, WFC1	F606W				Pattern 3, Exps 1-2 in Visit 03 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 03	490 Secs [==>425.0 Secs (Pattern 1)] [==>507.0 Secs (Pattern 2)] [==>507.0 Secs (Pattern 3)] [==>507.0 Secs (Pattern 4)]	[1]



Proposal 12877 - Visit 04 - Exposing the Maffei Group

Fri Jul 06 01:07:53 GMT 2012

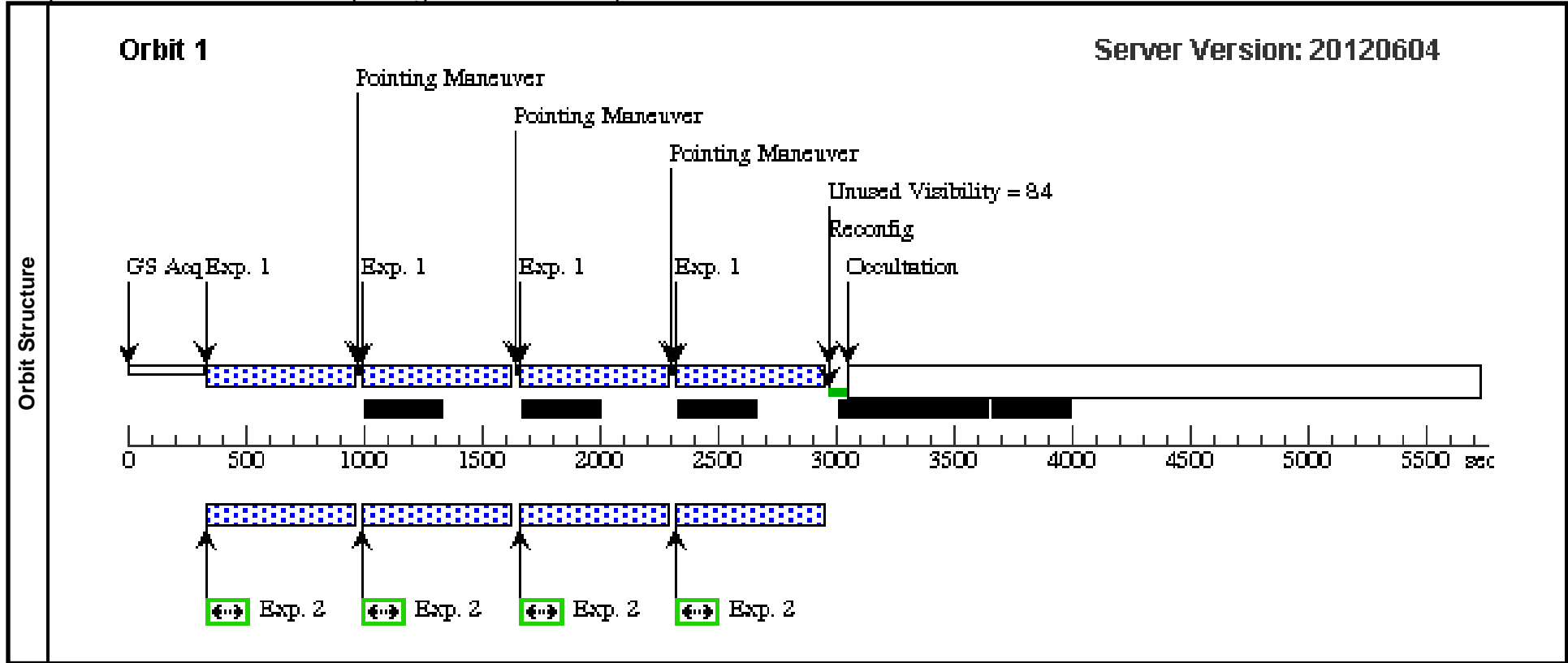
Visit	Proposal 12877, Visit 04 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: SCHED 100%; SAME ORIENT AS 03									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(3)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=4 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1-2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	MAFFEI-2	RA: 02 42 19.0298 (40.5792908d) Dec: +59 34 34.63 (59.57629d) Equinox: J2000		V=14.77	Reference Frame: ICRS				
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	MAFFEI-2-F160	(2) MAFFEI-2	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=7; SAMP-SEQ=SPAR S100			Pattern 3, Exps 1-2 in Visit 04 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 04	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]
2	MAFFEI-2-F814	ANY	ACS/WFC, ACCUM, WFC1	F814W				Pattern 3, Exps 1-2 in Visit 04 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 04	490 Secs [==>425.0 Secs (Pattern 1)] [==>507.0 Secs (Pattern 2)] [==>507.0 Secs (Pattern 3)] [==>507.0 Secs (Pattern 4)]	[1]



Proposal 12877 - Visit 05 - Exposing the Maffei Group

Fri Jul 06 01:07:54 GMT 2012

Visit	Proposal 12877, Visit 05 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: SCHED 100%; ORIENT 180D TO 30 D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(3)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=4 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1-2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(8)	IC-0342	RA: 03 47 54.1069 (56.9754454d) Dec: +67 56 53.86 (67.94829d) Equinox: J2000		V=9.37	Reference Frame: ICRS				
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	IC-342-110 W	(8) IC-0342	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=7; SAMP-SEQ=SPAR S100			Pattern 3, Exps 1-2 in Visit 05 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 05	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]
2	IC-342-F60 6	ANY	ACS/WFC, ACCUM, WFC1	F606W				Pattern 3, Exps 1-2 in Visit 05 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 05	490 Secs [==>425.0 Secs (Pattern 1)] [==>507.0 Secs (Pattern 2)] [==>507.0 Secs (Pattern 3)] [==>507.0 Secs (Pattern 4)]	[1]



Proposal 12877 - Visit 06 - Exposing the Maffei Group

Fri Jul 06 01:07:55 GMT 2012

Visit	Proposal 12877, Visit 06 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: SCHED 100%; SAME ORIENT AS 05									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(3)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=4 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1-2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(8)	IC-0342	RA: 03 47 54.1069 (56.9754454d) Dec: +67 56 53.86 (67.94829d) Equinox: J2000		V=9.37	Reference Frame: ICRS				
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	IC-342-F160	(8) IC-0342	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=7; SAMP-SEQ=SPAR S100			Pattern 3, Exps 1-2 in Visit 06 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 06	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]
2	IC-342-F814	ANY	ACS/WFC, ACCUM, WFC1	F814W				Pattern 3, Exps 1-2 in Visit 06 (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in Visit 06	490 Secs [==>425.0 Secs (Pattern 1)] [==>507.0 Secs (Pattern 2)] [==>507.0 Secs (Pattern 3)] [==>507.0 Secs (Pattern 4)]	[1]

