



15466 - A precise measurement of the mass distribution of the massive cluster lens eMACSJ1341.9-2442

Cycle: 25, 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) EMACSJ1341.9-2442	ACS/WFC	2	31-May-2018 11:06:56.0	yes
02	(1) EMACSJ1341.9-2442	ACS/WFC	2	31-May-2018 11:06:58.0	yes
03	(1) EMACSJ1341.9-2442	WFC3/IR	1	31-May-2018 11:06:59.0	yes

5 Total Orbits Used

ABSTRACT

We propose multi-band imaging with ACS and WFC3 for a gravitation-lensing measurement of the mass distribution in the core of the massive galaxy cluster eMACSJ1341.9-2442 ($z=0.835$), responsible for the 30-fold magnification of eMACSJ1341-QG-1 ($z=1.59$), a recently discovered quiescent galaxy that is representative of ultra-compact early-type galaxies at $z\sim 1.5$.

The goal of the requested observations is to reveal additional strong-lensing features that will allow us to create a robust lens model, thus permitting us to reconstruct the lensed galaxy's intrinsic properties in the source plane as a critical prerequisite for an in-depth, spatially resolved study of the properties and quenching mechanisms governing the evolution of this still poorly understood population of galaxies.

As a bonus, the proposed observations will reveal cluster substructure on scales of tens of kpc and hence clues to the merger geometry and formation history of one of the most massive clusters known at $z>0.8$.

OBSERVING DESCRIPTION

Building on the existing WFC3 F110W/F140W SNAPshot images of the core of eMACSJ1341.9-2442, this program will add substantially deeper observations at higher resolution in F606W and F814W (both ACS), as well as additional imaging in F105W and F140W (both WFC3). All observations will use dithering to ensure coverage of chip gaps, as well as efficient removal of artifacts and cosmic rays.

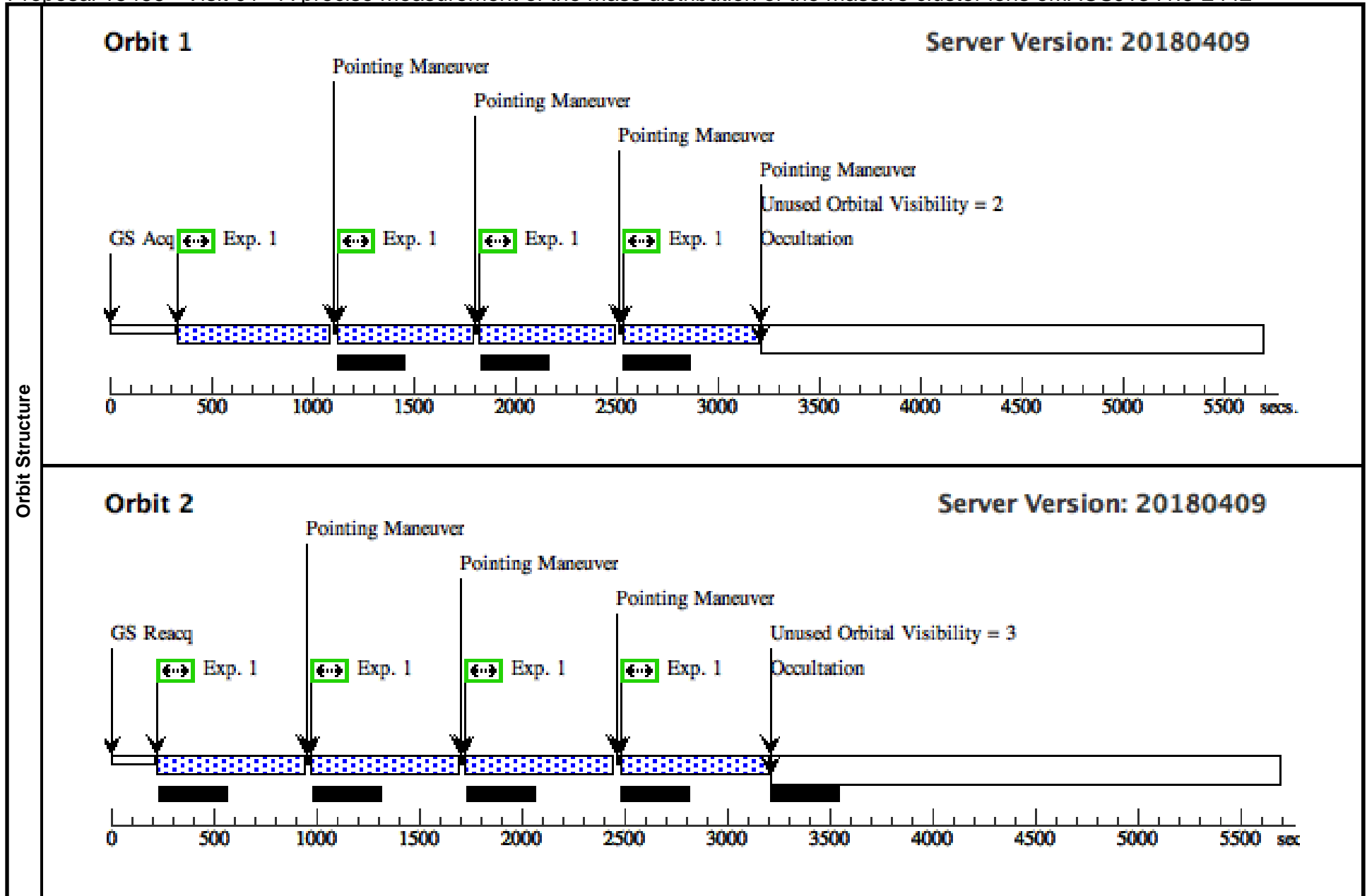
To maximize our ability to detect and identify multiple-image families from the matching colors and morphologies of all family members, we devote two orbits each to observations in ACS/F606W and F814W and (acknowledging the higher throughput of WFC3) a single orbit to imaging with WFC3, split 2:1 between F105W and F140W. The chosen uneven split between the two NIR passbands will result in even 2/3-orbit coverage across both filters, once the existing 1/3 orbit in F140W is added.

We minimize time losses incurred by buffer dumps by choosing sufficiently long integration times. For ACS, this means two sets of exposures in a box pattern, resulting in eight integrations for each filter (average exposure time per integration: 560s); for the WFC3 observations we use three sets of exposures along a 2-position line dither for our F105W observation and a single set of exposures in a 3-position line pattern for the F140W observation, each exposure being 278s long.

Proposal 15466 - Visit 01 - A precise measurement of the mass distribution of the massive cluster lens eMACSJ1341.9-2442

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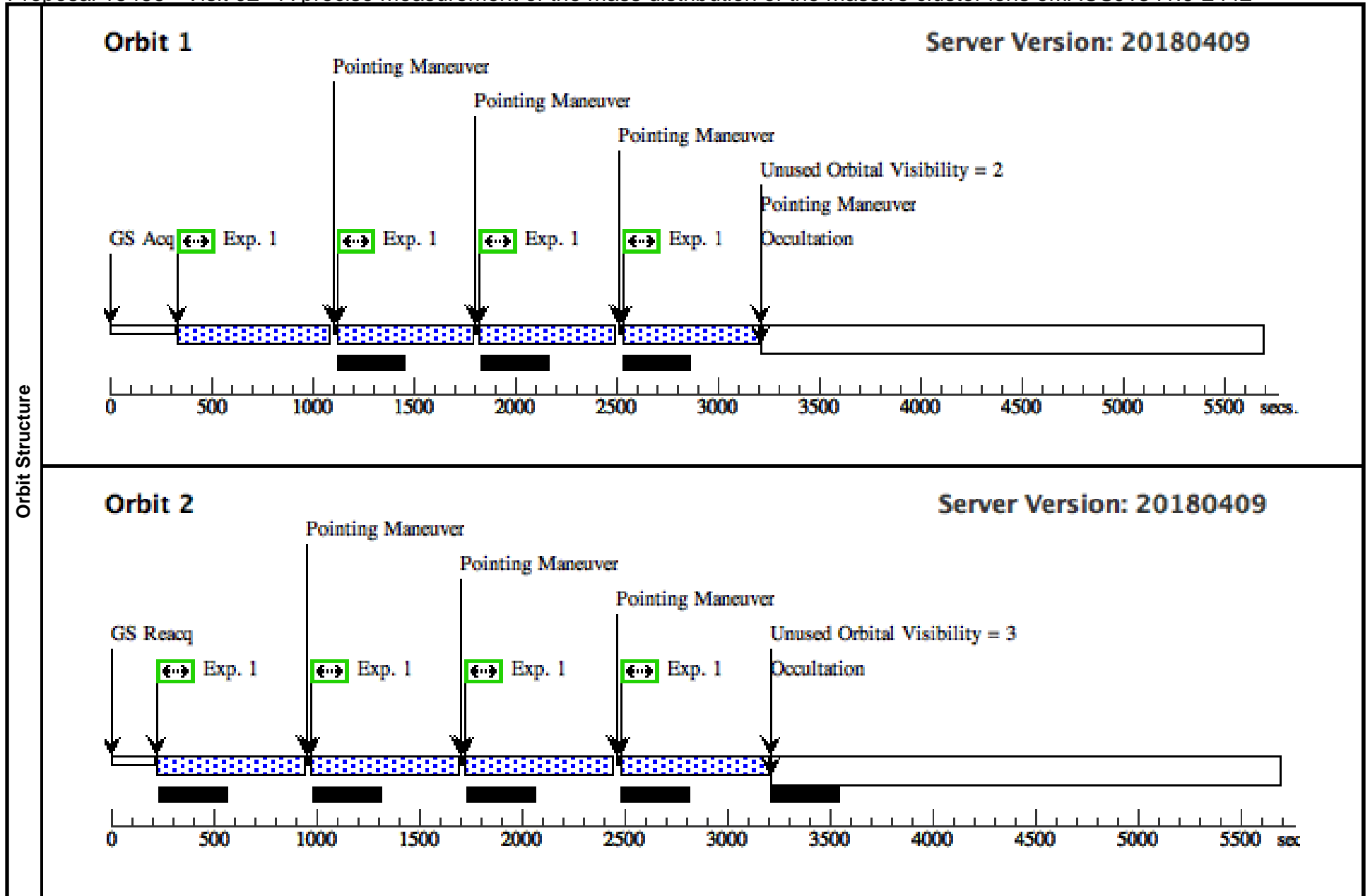
Visit	Proposal 15466, Visit 01, implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: ORIENT 42D TO 195 D; ORIENT 220D TO 17 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=true	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.262 Line Spacing=0.192	Coordinate Frame=POS-TARG Pattern Orientation=18.39 Angle Between Sides=68.14 Center Pattern=false	(1)			
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	EMACSJ1341.9-2442	RA: 13 42 0.2440 (205.5010167d) Dec: -24 42 0.75 (-24.70021d) Equinox: J2000	Epoch of Position: 2000	V=20	Reference Frame: ICRS				
	<i>Comments:</i> Category=CLUSTER OF GALAXIES Description=[GRAVITATIONAL LENS]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) EMACSJ1341.9-2442	ACS/WFC, ACCUM, WFCENTER	F606W			Pattern 1, Exps 1-1 in Visit 01 (1)	540 Secs (4568 Secs) [=>547.0 Secs (Pattern 1,1)] [=>547.0 Secs (Pattern 1,2)] [=>547.0 Secs (Pattern 1,3)] [=>547.0 Secs (Pattern 1,4)]	[1]
								[=>595.0 Secs (Pattern 2,1)] [=>595.0 Secs (Pattern 2,2)] [=>595.0 Secs (Pattern 2,3)] [=>595.0 Secs (Pattern 2,4)]	[2]	



Proposal 15466 - Visit 02 - A precise measurement of the mass distribution of the massive cluster lens eMACSJ1341.9-2442

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Visit	Proposal 15466, Visit 02, implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: ORIENT 42D TO 195 D; ORIENT 220D TO 17 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=true	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.262 Line Spacing=0.192	Coordinate Frame=POS-TARG Pattern Orientation=18.39 Angle Between Sides=68.14 Center Pattern=false	(1)			
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	EMACSJ1341.9-2442	RA: 13 42 0.2440 (205.5010167d) Dec: -24 42 0.75 (-24.70021d) Equinox: J2000	Epoch of Position: 2000	V=20	Reference Frame: ICRS				
	<i>Comments:</i> Category=CLUSTER OF GALAXIES Description=[GRAVITATIONAL LENS]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) EMACSJ1341.9-2442	ACS/WFC, ACCUM, WFCENTER	F814W			Pattern 1, Exps 1-1 in Visit 02 (1)	520 Secs (4568 Secs) [=>547.0 Secs (Pattern 1,1)] [=>547.0 Secs (Pattern 1,2)] [=>547.0 Secs (Pattern 1,3)] [=>547.0 Secs (Pattern 1,4)]	[1]
								[=>595.0 Secs (Pattern 2,1)] [=>595.0 Secs (Pattern 2,2)] [=>595.0 Secs (Pattern 2,3)] [=>595.0 Secs (Pattern 2,4)]	[2]	



Proposal 15466 - Visit 03 - A precise measurement of the mass distribution of the massive cluster lens eMACSJ1341.9-2442

Thu May 31 15:07:00 GMT 2018

Visit	Proposal 15466, Visit 03, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: ORIENT 118.5D TO 124.5 D									
	#	Primary Pattern	Secondary Pattern	Exposures						
Patterns	(2)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)						
	(3)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.636 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(2)						
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	EMACSJ1341.9-2442	RA: 13 42 0.2440 (205.5010167d) Dec: -24 42 0.75 (-24.70021d) Equinox: J2000	Epoch of Position: 2000	V=20	Reference Frame: ICRS				
<i>Comments:</i> Category=CLUSTER OF GALAXIES Description=[GRAVITATIONAL LENS]										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) EMACSJ1341.9-2442	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=12; SAMP-SEQ=SPAR S25			Sequence 1-2 Non-Int in Visit 03 Pattern 2, Exps 1-1 in Sequence 1-2 Non-Int in Visit 03 (2)	277.937956 Secs (833.814 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]
2		(1) EMACSJ1341.9-2442	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=12; SAMP-SEQ=SPAR S25			Sequence 1-2 Non-Int in Visit 03 Pattern 3, Exps 2-2 in Sequence 1-2 Non-Int in Visit 03 (3)	277.937956 Secs X 3 (1667.628 Secs) [==>(Pattern 1, Copy 1)] [==>(Pattern 1, Copy 2)] [==>(Pattern 1, Copy 3)] [==>(Pattern 2, Copy 1)] [==>(Pattern 2, Copy 2)] [==>(Pattern 2, Copy 3)]	[1]

