



## 10166 - ACS and WFPC2 Stellar Photometry in the Kepler Mission Target Field

Cycle: 13, Proposal Category: GO

(Availability Mode: SUPPORTED)

### INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
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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) GENERIC-FIELD-1	ACS/WFC	2	22-Mar-2007 21:01:08.0	yes
02	(2) GENERIC-FIELD-2	ACS/WFC	2	22-Mar-2007 21:01:18.0	yes
03	(3) GENERIC-FIELD-3	ACS/WFC	2	22-Mar-2007 21:01:26.0	yes
04	(4) GENERIC-FIELD-4	WFPC2	1	22-Mar-2007 21:01:31.0	yes
05	(5) GENERIC-FIELD-5	WFPC2	1	22-Mar-2007 21:01:38.0	yes
06	(6) GENERIC-FIELD-6	WFPC2	1	22-Mar-2007 21:01:42.0	yes
07	(7) GENERIC-FIELD-7	WFPC2	1	22-Mar-2007 21:01:45.0	yes

10 Total Orbits Used

### ABSTRACT

We will observe three regions at the Galactic Equator (GE) to determine the number of stars in the magnitude range from 18 to 25 in the target field of the NASA Kepler mission. This mission will search for Earth-size planets orbiting other stars. The field is a twelve by twelve degree square in Cygnus. It abuts the GE. The detection technique is to search photometrically for planetary transits. Faint eclipsing binaries that are not spatially resolved from the target star by Kepler may cause confusion, leading to false positive detections. The HST is uniquely capable of determining the potential magnitude of the issue in the region of the GE, where stellar densities are extremely high.

### **OBSERVING DESCRIPTION**

We have received six orbits to obtain ARC and WFPC2 imaging photometry of faint stars in support of the NASA Kepler mission. We will observe three different fields, all near the Galactic Equator (EG), with two orbits per pointing. In response to comments from the TAC, we will do both of the orbits for the first pointing using only the F606W filters of the two instruments, in order to verify that we can achieve the required signal to noise ratio at the faint end of our required magnitude range, which is 18 to 25, while not saturating the field because of bright stars. Our work with the ACS ETC is extremely encouraging that this will not be a problem. We will have a delay between the first pointing and the second two, in which we will determine definitively whether or not we can accomplish the requirement in one orbit. If so, we will do the second and third pointings with one orbit of F606W and one of F814W images, as originally proposed. Otherwise, we will use two both orbits per pointing for F606W images.

### **REAL TIME JUSTIFICATION**

We are not requesting realtime observations.

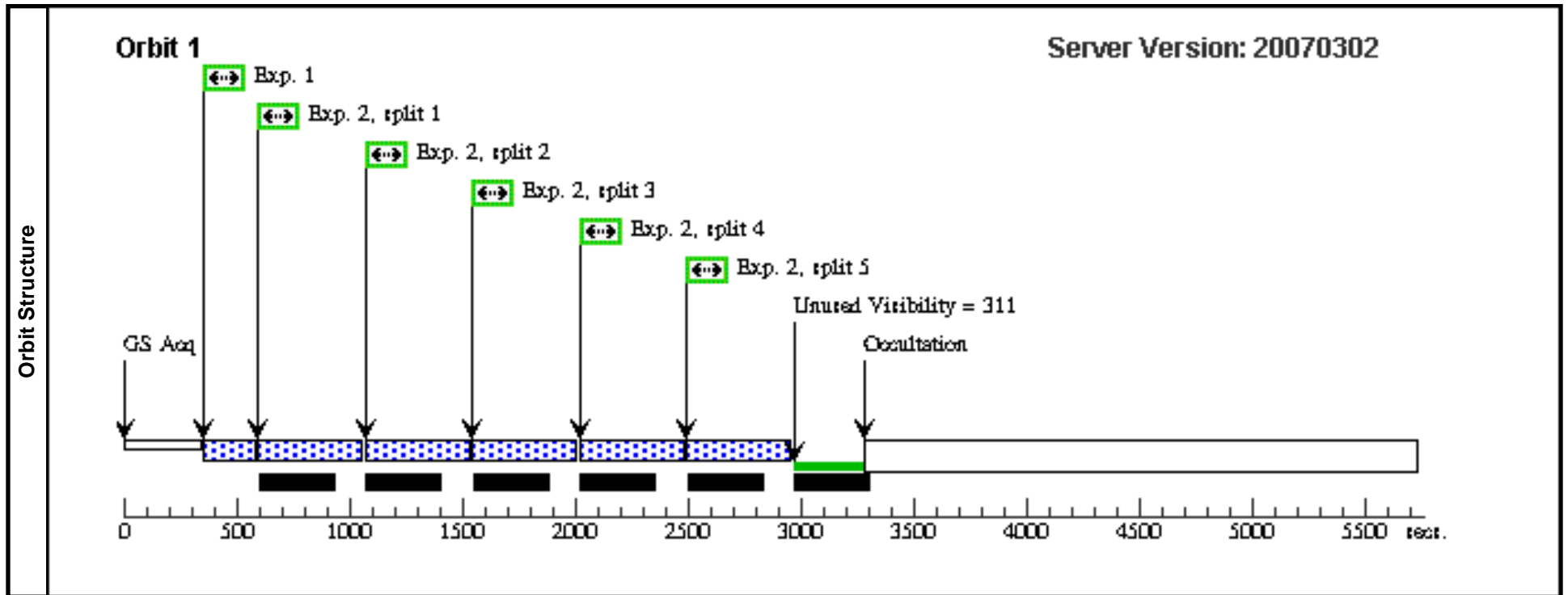
### **CALIBRATION JUSTIFICATION**

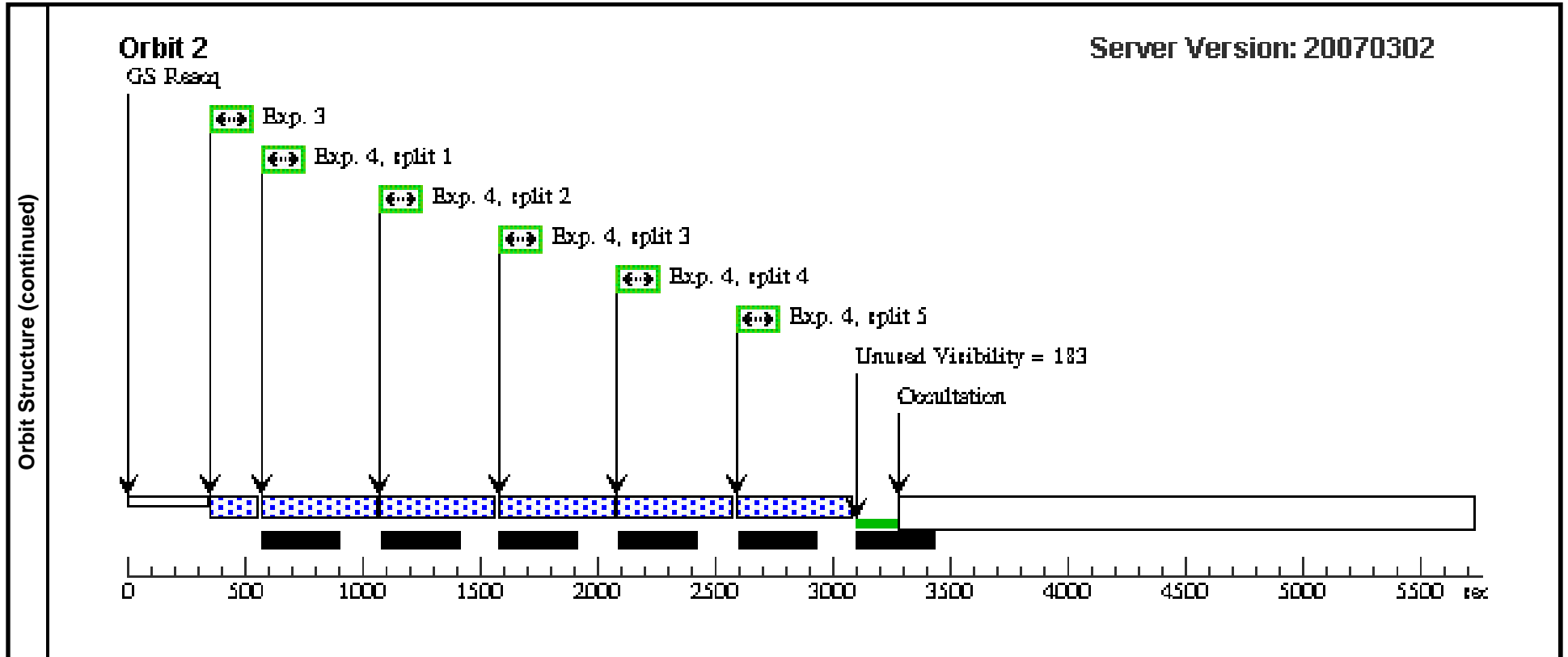
We are not requesting calibration observations for this proposal.

Proposal 10166 - Visit 01 - ACS and WFPC2 Stellar Photometry in the Kepler Mission Target Field

Fri Mar 23 01:01:47 GMT 2007

<b>Visit</b>	<p><b>Proposal 10166, Visit 01, completed</b></p> <p><b>Diagnostic Status: No Diagnostics</b></p> <p>Scientific Instruments: ACS/WFC</p> <p>Special Requirements: PCS MODE FINE</p> <p><i>Comments: It would be preferred if Visit 1 could be scheduled as early as practical in Cycle 13. But this is not a requirement.</i></p> <p><i>It would be strongly preferred if the roll angle for all exposures in a specific visit could be identical.</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)		GENERIC-FIELD-1	RA: 20 05 37.2500 (301.4052083d) Dec: +31 49 53.56 (31.83154d) Equinox: J2000	Proper Motion RA: 0.0s/yr Proper Motion Dec: 0.0"/yr Epoch of Position: 2000.0	V=25.0	Region Position (GENERIC-FIELD-1) Coordinate Source: Naval Observatory Catalogue				
<p><i>Comments: The target is an anonymous region near galactic longitude 69.27 and galactic latitude 0 degrees, looking into the portion of the Orion Arm that is in Cygnus. It was selected because there are no stars brighter than nineteenth magnitude with a region the size of the ARC HRC field. We will be determining the numbers of stars from magnitudes 18 to 25.</i></p> <p><i>Note that we have investigated various regions of interest, and we have determined several, on the basis of Naval Observatory catalogues, that do not have any stars brighter than magnitude 18 in an area that is slightly bigger than the ACS HRC field. We therefore require that the center of the HRC field be pointed directly at the specified RA and DEC of the position, and we will accept any roll angle orientation. The target as defined does not have a name, does not have a parallax, etc. We are going to determine how many stars fainter than magnitude 18 are in the regions.</i></p>										
<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) GENERIC-FIELD-1	ACS/WFC, ACCUM, WFC	F814W	CR-SPLIT=NO; GAIN=2			20.0 Secs [==>]	[1]
	2		(1) GENERIC-FIELD-1	ACS/WFC, ACCUM, WFC	F814W	GAIN=2; CR-SPLIT=5			1695.0 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)]	[1]
	3		(1) GENERIC-FIELD-1	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=NO; GAIN=2			20.0 Secs [==>]	[2]
	4		(1) GENERIC-FIELD-1	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=5; GAIN=2			1850.0 Secs [==>370.0 Secs (Split 1)] [==>370.0 Secs (Split 2)] [==>370.0 Secs (Split 3)] [==>370.0 Secs (Split 4)] [==>370.0 Secs (Split 5)]	[2]

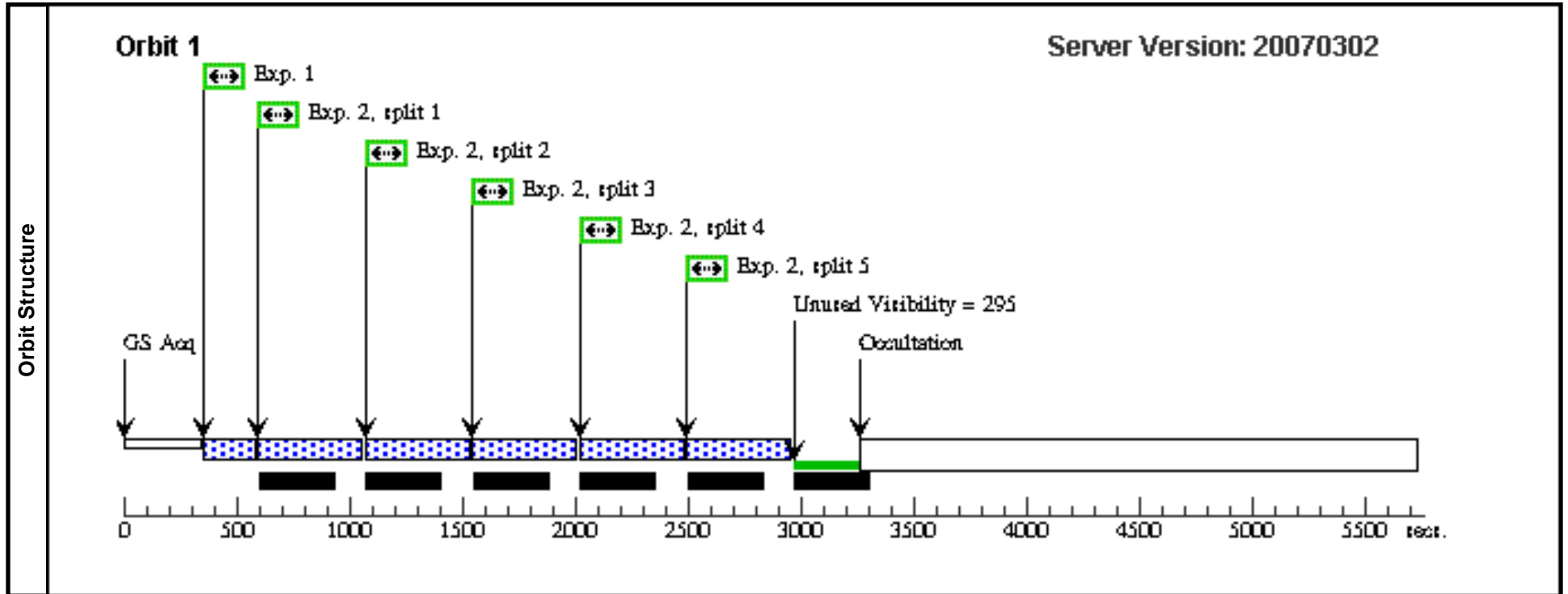


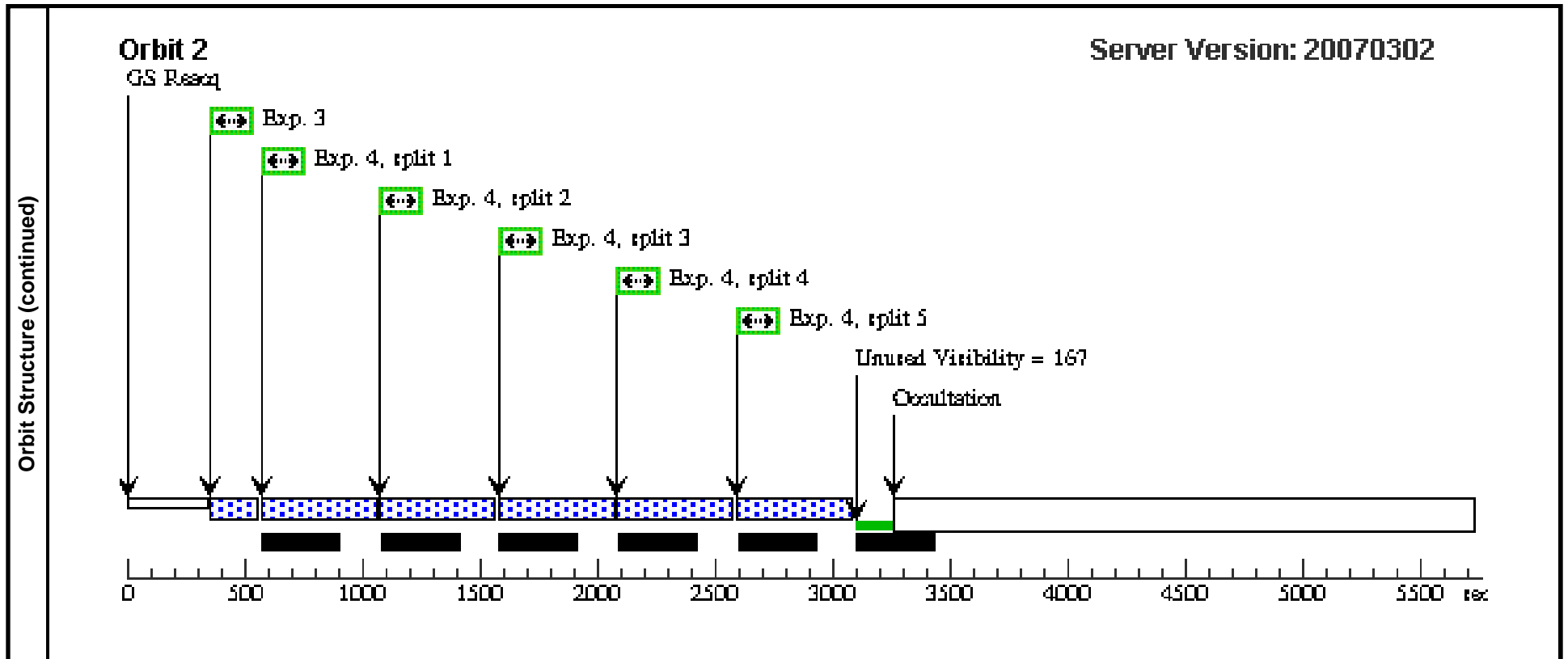


Proposal 10166 - Visit 02 - ACS and WFPC2 Stellar Photometry in the Kepler Mission Target Field

Fri Mar 23 01:01:49 GMT 2007

<b>Visit</b>	<b>Proposal 10166, Visit 02, failed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: ACS/WFC Special Requirements: PCS MODE FINE; ON HOLD ; ON HOLD FOR 01 Comments: On hold for results from Visit 1. On Hold Comments: On hold for results from Visit 1.									
	<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)		GENERIC-FIELD-2	RA: 19 56 45.9200 (299.1913333d) Dec: +29 20 11.97 (29.33666d) Equinox: J2000	Proper Motion RA: 0.0s/yr Proper Motion Dec: 0.0"/yr Epoch of Position: 2000.0	V=25.0	Region Position (GENERIC-FIELD-2) Coordinate Source: Naval Observatory Catalogue				
<i>Comments: Galactic longitude is 66.1 degrees, galactic latitude is 0.3 degrees.</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	(2) GENERIC-FIELD-2	(2) GENERIC-FIELD-2	ACS/WFC, ACCUM, WFC	F814W	CR-SPLIT=NO; GAIN=2			20.0 Secs [==>]	[1]
	2	(2) GENERIC-FIELD-2	(2) GENERIC-FIELD-2	ACS/WFC, ACCUM, WFC	F814W	GAIN=2; CR-SPLIT=5			1695.0 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)]	[1]
	3	(2) GENERIC-FIELD-2	(2) GENERIC-FIELD-2	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=NO; GAIN=2			20.0 Secs [==>]	[2]
	4	(2) GENERIC-FIELD-2	(2) GENERIC-FIELD-2	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=5; GAIN=2			1850.0 Secs [==>370.0 Secs (Split 1)] [==>370.0 Secs (Split 2)] [==>370.0 Secs (Split 3)] [==>370.0 Secs (Split 4)] [==>370.0 Secs (Split 5)]	[2]

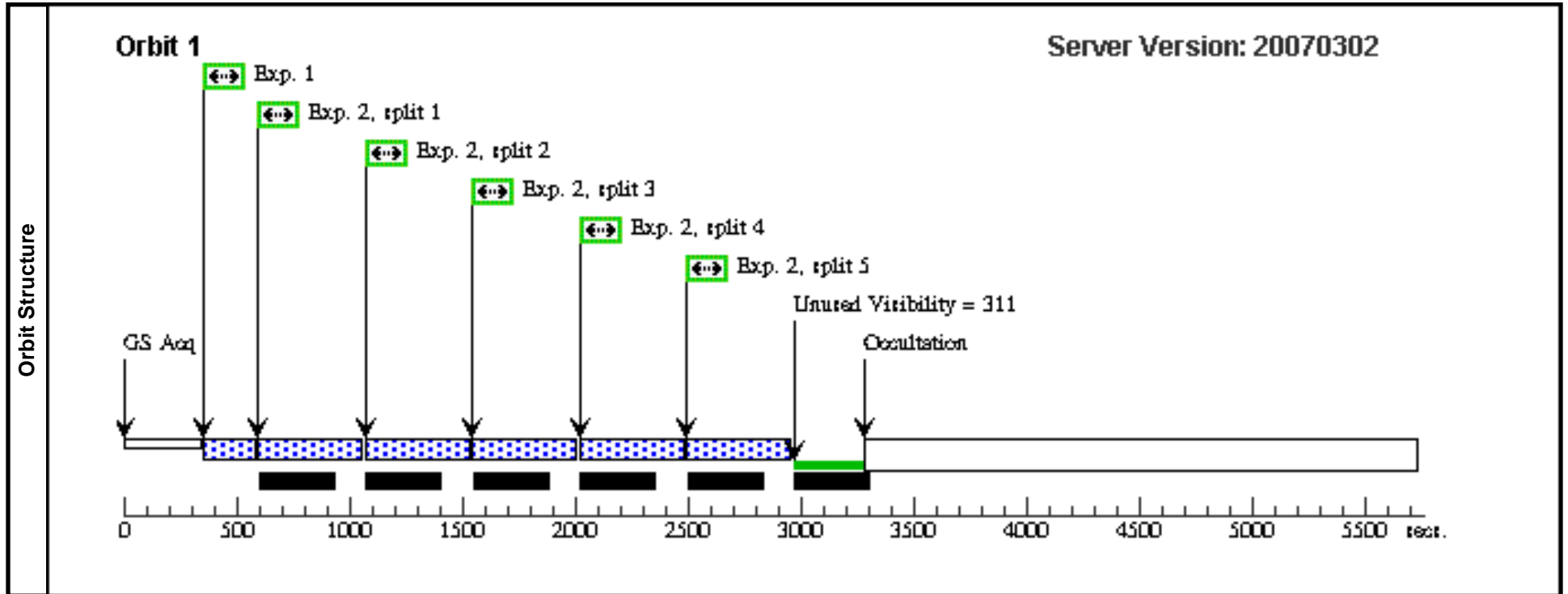


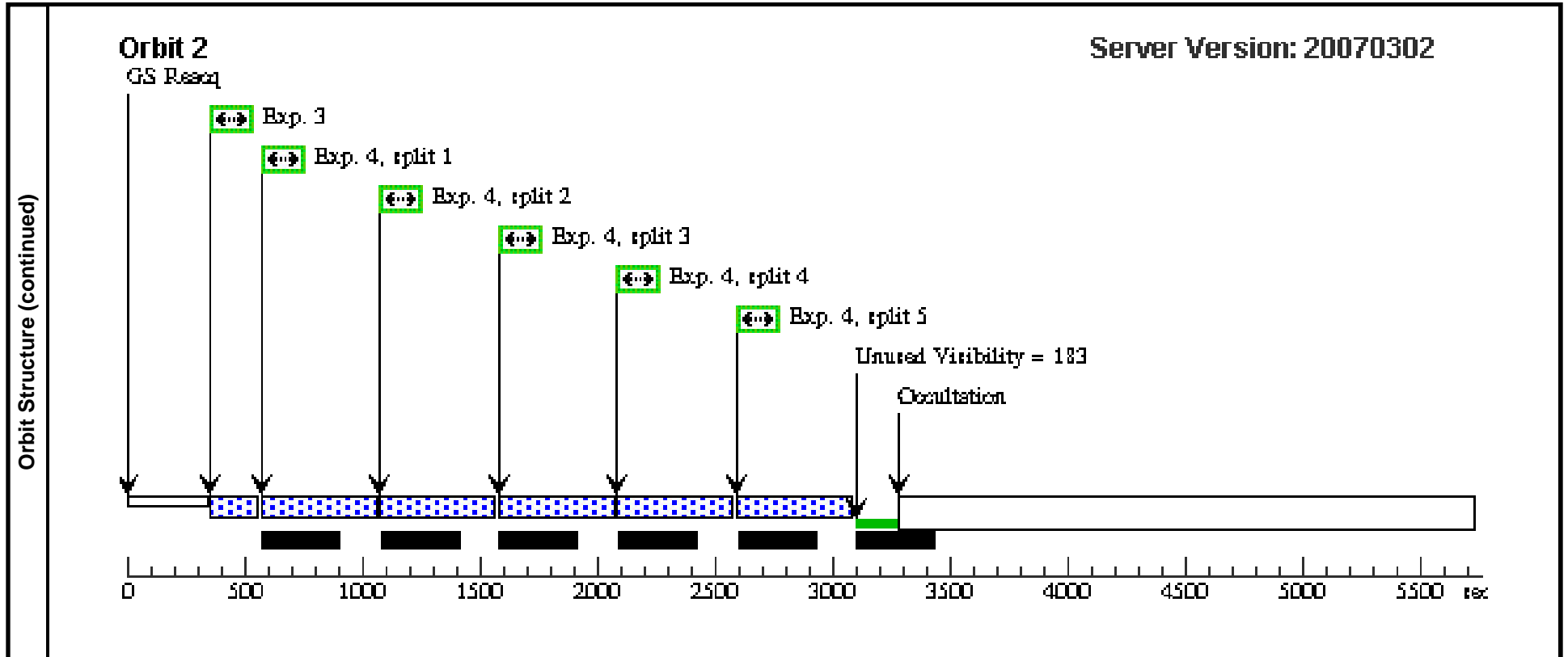


Proposal 10166 - Visit 03 - ACS and WFPC2 Stellar Photometry in the Kepler Mission Target Field

Fri Mar 23 01:01:50 GMT 2007

Visit	<b>Proposal 10166, Visit 03, failed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: ACS/WFC Special Requirements: PCS MODE FINE; ON HOLD ; ON HOLD FOR 01 Comments: <i>On hold for results from Visit 1.</i> On Hold Comments: <i>On hold for results from Visit 1.</i>									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(3)	GENERIC-FIELD-3	RA: 20 04 39.0800 (301.1628333d) Dec: +30 34 17.53 (30.57154d) Equinox: J2000		V=25.0	Region Position (GENERIC-FIELD-3) Coordinate Source: Naval Observatory Catalogues				
	<i>Comments: Galactic longitude is 68.1 degrees, galactic latitude is -0.5 degrees.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(3) GENERIC-FIELD-3	ACS/WFC, ACCUM, WFC	F814W	CR-SPLIT=NO; GAIN=2			20.0 Secs [==>]	[1]
	2		(3) GENERIC-FIELD-3	ACS/WFC, ACCUM, WFC	F814W	GAIN=2; CR-SPLIT=5			1695.0 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)]	[1]
	3		(3) GENERIC-FIELD-3	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=NO; GAIN=2			20.0 Secs [==>]	[2]
	4		(3) GENERIC-FIELD-3	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=5; GAIN=2			1850.0 Secs [==>370.0 Secs (Split 1)] [==>370.0 Secs (Split 2)] [==>370.0 Secs (Split 3)] [==>370.0 Secs (Split 4)] [==>370.0 Secs (Split 5)]	[2]

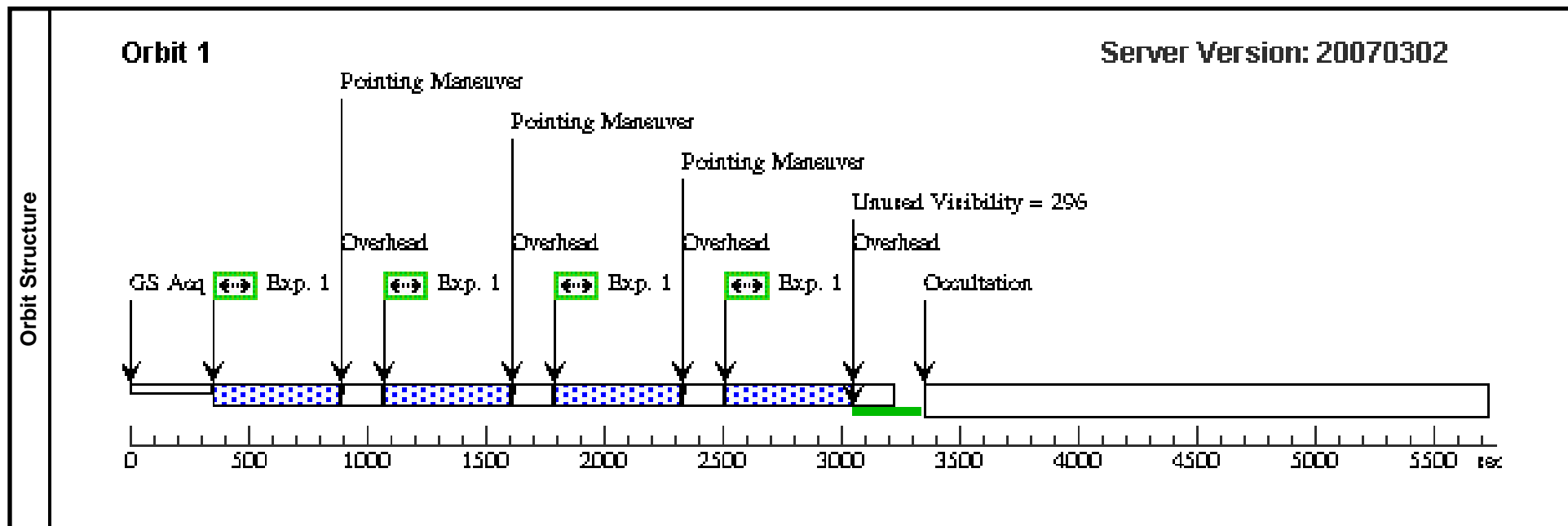




Proposal 10166 - Visit 04 - ACS and WFPC2 Stellar Photometry in the Kepler Mission Target Field

Fri Mar 23 01:01:52 GMT 2007

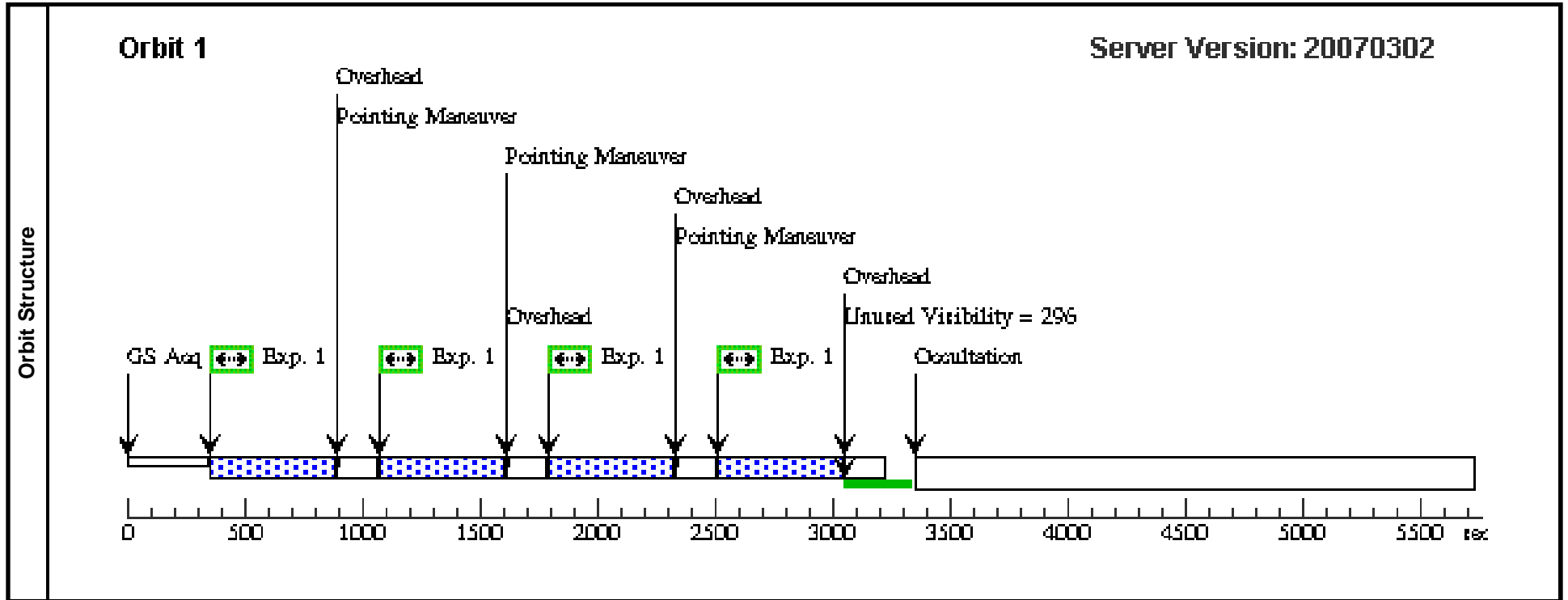
<b>Visit</b>	<b>Proposal 10166, Visit 04, pi</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFPC2 Special Requirements: PCS MODE FINE										
	<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>				<b>Secondary Pattern</b>			<b>Exposures</b>	
(1)		Pattern Type=BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.557 Line Spacing=0.557	Coordinate Frame=POS-TARG Pattern Orientation=26.6 Angle Between Sides=143.1 Center Pattern=false						(1)		
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>		<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(4)	GENERIC-FIELD-4	RA: 19 22 5.0000 (290.5208333d) Dec: +44 54 30.00 (44.90833d) Equinox: J2000				V=25.0	Region Position (GENERIC-FIELD-4) Coordinate Source: Naval Observatory Catalogues			
<i>Comments: home plate</i> <i>Kepler field coordinates: row 455.5 column 354.3</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	(4) GENERIC-FIELD-4	WFPC2, IMAGE, WFALL	F606W	CR-SPLIT=NO			Pattern 1-1 (1)	400.0 Secs [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)]		[1]



Proposal 10166 - Visit 05 - ACS and WFPC2 Stellar Photometry in the Kepler Mission Target Field

Fri Mar 23 01:01:52 GMT 2007

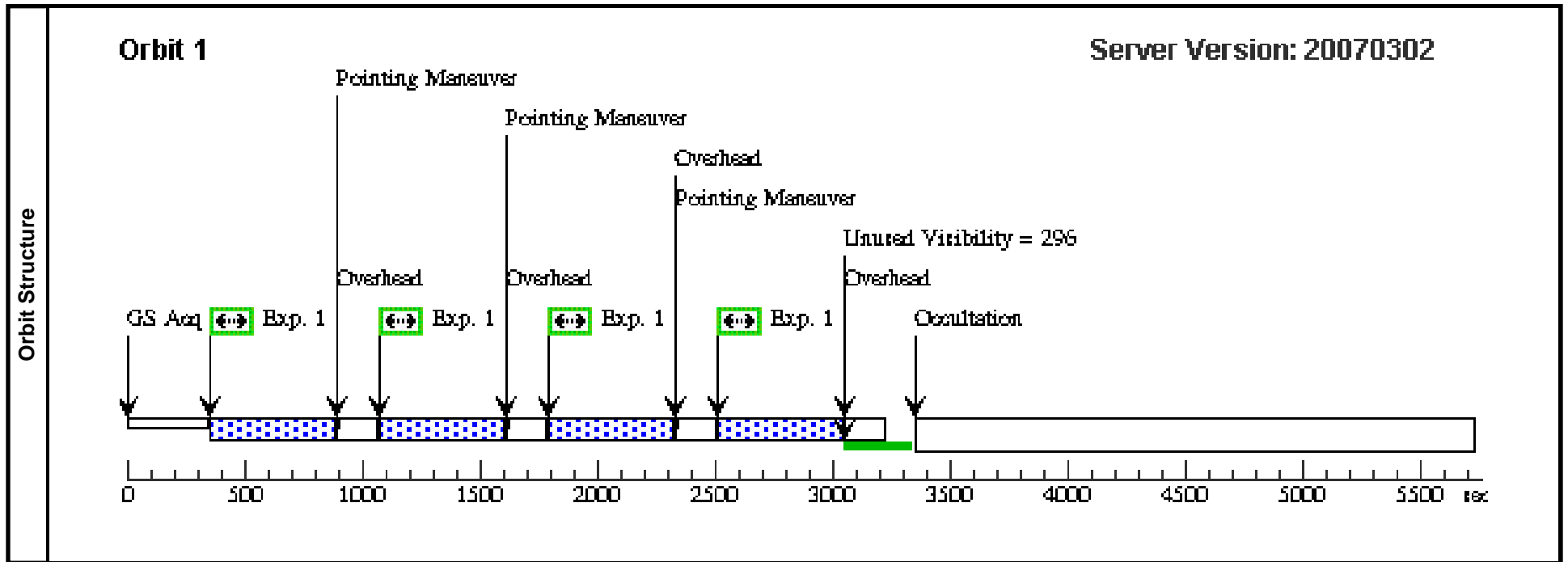
<b>Visit</b>	<b>Proposal 10166, Visit 05, pi</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFPC2 Special Requirements: PCS MODE FINE										
	<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>				<b>Secondary Pattern</b>				<b>Exposures</b>
(1)		Pattern Type=BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.557 Line Spacing=0.557	Coordinate Frame=POS-TARG Pattern Orientation=26.6 Angle Between Sides=143.1 Center Pattern=false					(1)			
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>		<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(5)	GENERIC-FIELD-5	RA: 19 21 35.0000 (290.3958333d) Dec: +44 58 0.00 (44.96667d) Equinox: J2000				V=25.0	Region Position (GENERIC-FIELD-5) Coordinate Source: Naval Observatory Catalogues			
<i>Comments: first base</i> <i>Kepler field coordinates: row 317.0 column 344.5</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	(5) GENERIC-FIELD-5	WFPC2, IMAGE, WFALL	F606W	CR-SPLIT=NO			Pattern 1-1 (1)	400.0 Secs	[=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)]	[1]



Proposal 10166 - Visit 06 - ACS and WFPC2 Stellar Photometry in the Kepler Mission Target Field

Fri Mar 23 01:01:53 GMT 2007

<b>Visit</b>	<b>Proposal 10166, Visit 06, pi</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFPC2 Special Requirements: PCS MODE FINE										
	<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>				<b>Secondary Pattern</b>			<b>Exposures</b>	
(1)		Pattern Type=BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.557 Line Spacing=0.557	Coordinate Frame=POS-TARG Pattern Orientation=26.6 Angle Between Sides=143.1 Center Pattern=false						(1)		
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>		<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(6)	GENERIC-FIELD-6	RA: 19 21 4.0000 (290.2666667d) Dec: +41 10 10.00 (41.16944d) Equinox: J2000				V=25.0	Region Position (GENERIC-FIELD-6) Coordinate Source: Naval Observatory Catalogues			
<i>Comments: pitcher's mound</i> <i>Kepler field coordinates: row 106.3 column 1100.0 (centre of field)</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		(6) GENERIC-FIELD-6	WFPC2, IMAGE, WFALL	F606W	CR-SPLIT=NO		Pattern 1-1 (1)	400.0 Secs		
									[=>(Pattern 1)]		
									[=>(Pattern 2)]		
									[=>(Pattern 3)]		
									[=>(Pattern 4)]	[1]	



Proposal 10166 - Visit 07 - ACS and WFPC2 Stellar Photometry in the Kepler Mission Target Field

Fri Mar 23 01:01:54 GMT 2007

<b>Visit</b>	<b>Proposal 10166, Visit 07, pi</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFPC2 Special Requirements: PCS MODE FINE										
	<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>				<b>Secondary Pattern</b>				<b>Exposures</b>
(1)		Pattern Type=BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.557 Line Spacing=0.557	Coordinate Frame=POS-TARG Pattern Orientation=26.6 Angle Between Sides=143.1 Center Pattern=false					(1)			
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>		<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(7)	GENERIC-FIELD-7	RA: 19 17 58.0000 (289.4916667d) Dec: +43 30 30.00 (43.50833d) Equinox: J2000				V=25.0	Region Position (GENERIC-FIELD-7) Coordinate Source: Naval Observatory Catalogues			
<i>Comments: third base</i> <i>Kepler field coordinates: row 152.4 column 144.6</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	(7) GENERIC-FIELD-7	D-7	WFPC2, IMAGE, WFALL	F606W	CR-SPLIT=NO		Pattern 1-1 (1)	400.0 Secs	[=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)]	[1]

