



12290 - Do Rocky Extrasolar Minor Planets Have a Composition Similar to Bulk Earth?

Cycle: 18, Proposal Category: GO
(Availability Mode: SUPPORTED)

INVESTIGATORS

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Ms. Siyi Xu (CoI)	University of California - Los Angeles	xsynju@gmail.com

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) GD-362	COS/NUV	3	14-Feb-2011 21:58:55.0	yes
02	(2) PG-1225-079	COS/NUV	1	14-Feb-2011 21:59:01.0	yes
03	(3) GD-40	COS/FUV COS/NUV	3	14-Feb-2011 21:59:06.0	yes
04	(4) G241-6	COS/FUV COS/NUV	3	14-Feb-2011 21:59:13.0	yes
05	(5) G29-38	COS/FUV	4	14-Feb-2011 21:59:19.0	yes
55	(5) G29-38	COS/FUV	3	14-Feb-2011 21:59:25.0	yes
06	(6) GD-133	COS/FUV COS/NUV	5	14-Feb-2011 21:59:32.0	yes

22 Total Orbits Used

ABSTRACT

We propose to observe six externally-polluted white dwarfs with dust disks to measure accurate abundances of volatile elements, especially carbon and sulfur. These data will enable us to determine whether the minor planets now being accreted onto the target white dwarfs more resemble primitive meteorites such as CI chondrites or more resemble bulk Earth.

OBSERVING DESCRIPTION

We have two different observing strategies. For four targets (GD 40, G241-6 G29-38 and GD 133), we propose to obtain spectra with the G130M grating in the FUV module and achieve a signal-to-noise ratio (SNR) of at least 20. Our main lines of interest are C I 1329 A, Cl I 1334 A, Cl I 1347 A, N I 1167 A, S I 1425 A and Ge II 1237 A. To estimate the number of orbits, we use the GALEX magnitude measured at 1528 A and then extrapolate to shorter wavelengths with our model atmospheres. With these estimated fluxes, we then use the COS ETC to determine the required on-target observing time. We request a SNR of 20 since some of our target lines are likely to be weak. We include the overheads for target acquisition and instrumental set-up to determine the expected number of cycles.

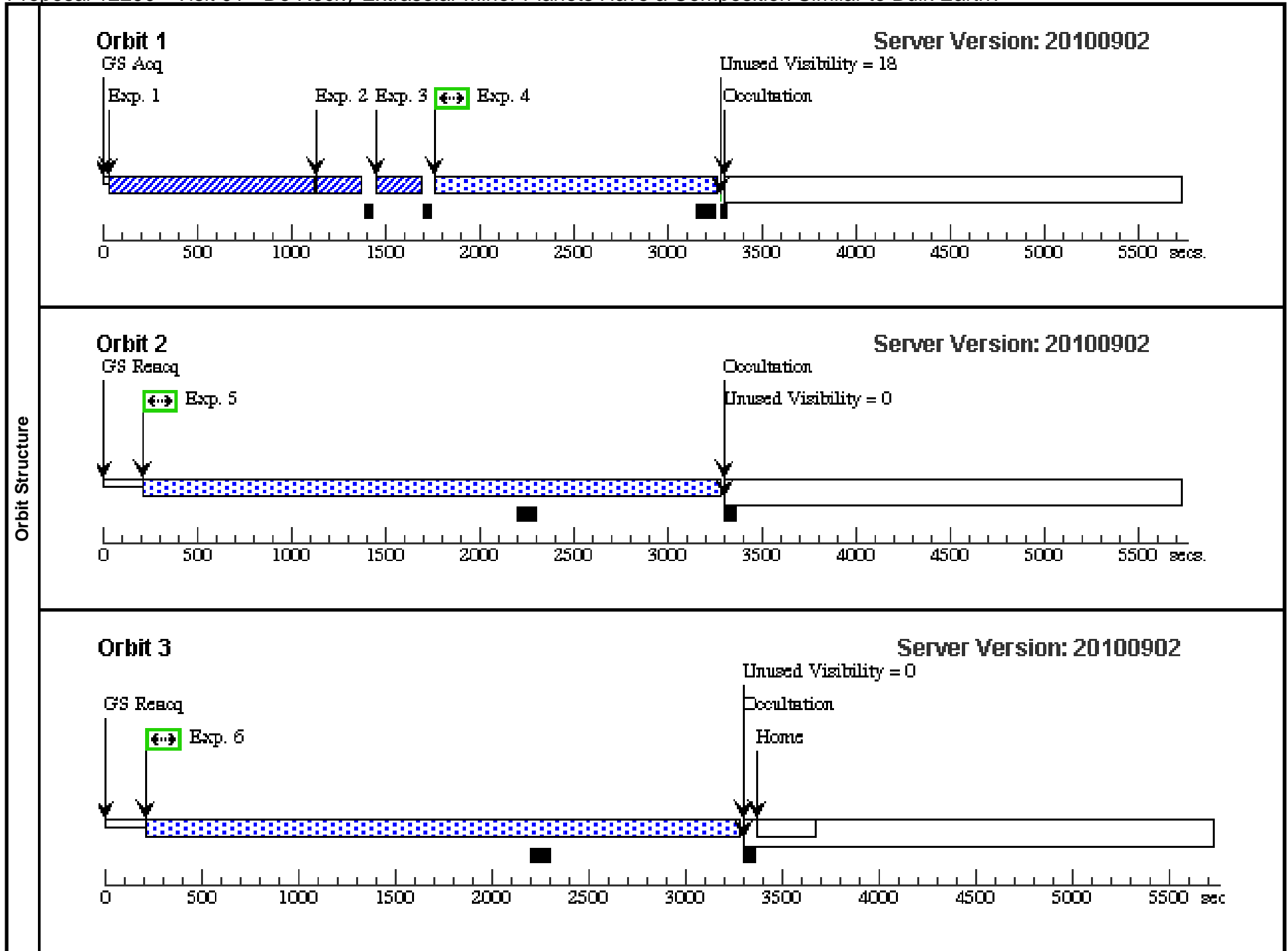
For two targets (GD 362 and PG 1225-079), we propose to obtain COS spectra with the G185M grating in the NUV module and with a signal-to-noise of at least 10 with the goal of determining abundances from C I 1931 A and S I 1820 A . Following an analogous procedure for the other four targets, we use the COS ETC to determine the required on-target observing time. With a SNR of 10, we find from our simulations that we can determine C and S abundances with an uncertainty of 0.3 dex which will be adequate to distinguish between models where the elemental compositions differ by at least a factor of 8.

Our targets are sufficiently faint that COS safety is not a problem.

Proposal 12290 - Visit 01 - Do Rocky Extrasolar Minor Planets Have a Composition Similar to Bulk Earth?

Tue Feb 15 02:59:37 GMT 2011

Fixed Targets	#		Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
		(1)	GD-362		RA: 17 31 34.3300 (262.8930417d) Dec: +37 05 20.90 (37.08914d) Equinox: J2000	Proper Motion RA: 26 mas/yr Proper Motion Dec: -220 mas/yr Epoch of Position: 2000	V=16.23	Reference Frame: ICRS		
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	TA(ACQ/SEARCH)	(1) GD-362	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=3			56.5 Secs [==>]	[1]
	2	TA(ACQ/IMAGE)	(1) GD-362	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				56.5 Secs [==>]	[1]
	3	TA(ACQ/IMAGE)	(1) GD-362	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				56.5 Secs [==>]	[1]
	4	GD362	(1) GD-362	COS/NUV, TIME-TAG, PSA	G185M 1921 A	BUFFER-TIME=1207; FP-POS=1			2000 Secs [==>1307.0 Secs]	[1]
	5	GD362	(1) GD-362	COS/NUV, TIME-TAG, PSA	G185M 1921 A	BUFFER-TIME=1987; FP-POS=2			2000 Secs [==>3052.0 Secs]	[2]
	6	GD362	(1) GD-362	COS/NUV, TIME-TAG, PSA	G185M 1921 A	BUFFER-TIME=1987; FP-POS=3			2000 Secs [==>3052.0 Secs]	[3]



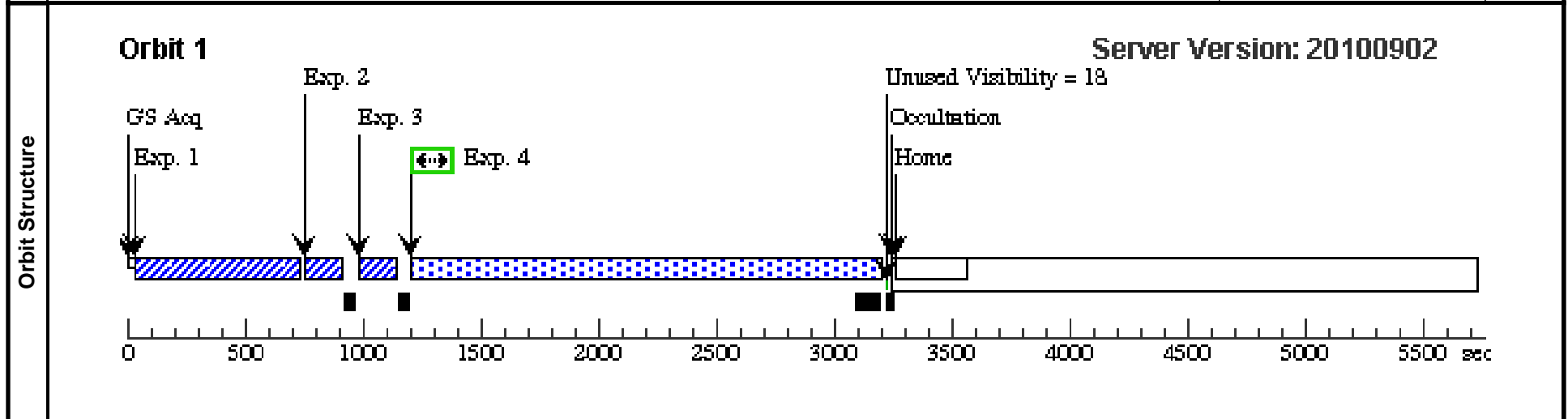
Proposal 12290 - Visit 02 - Do Rocky Extrasolar Minor Planets Have a Composition Similar to Bulk Earth?

Tue Feb 15 02:59:39 GMT 2011

Visit	Proposal 12290, Visit 02, implementation				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: COS/NUV				
	Special Requirements: (none)				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	PG-1225-079	RA: 12 27 47.3630 (186.9473458d) Dec: -08 14 37.96 (-8.24388d) Equinox: J2000	Proper Motion RA: -118 mas/yr Proper Motion Dec: -42 mas/yr Epoch of Position: 2000	V=14.8	Reference Frame: ICRS
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>						

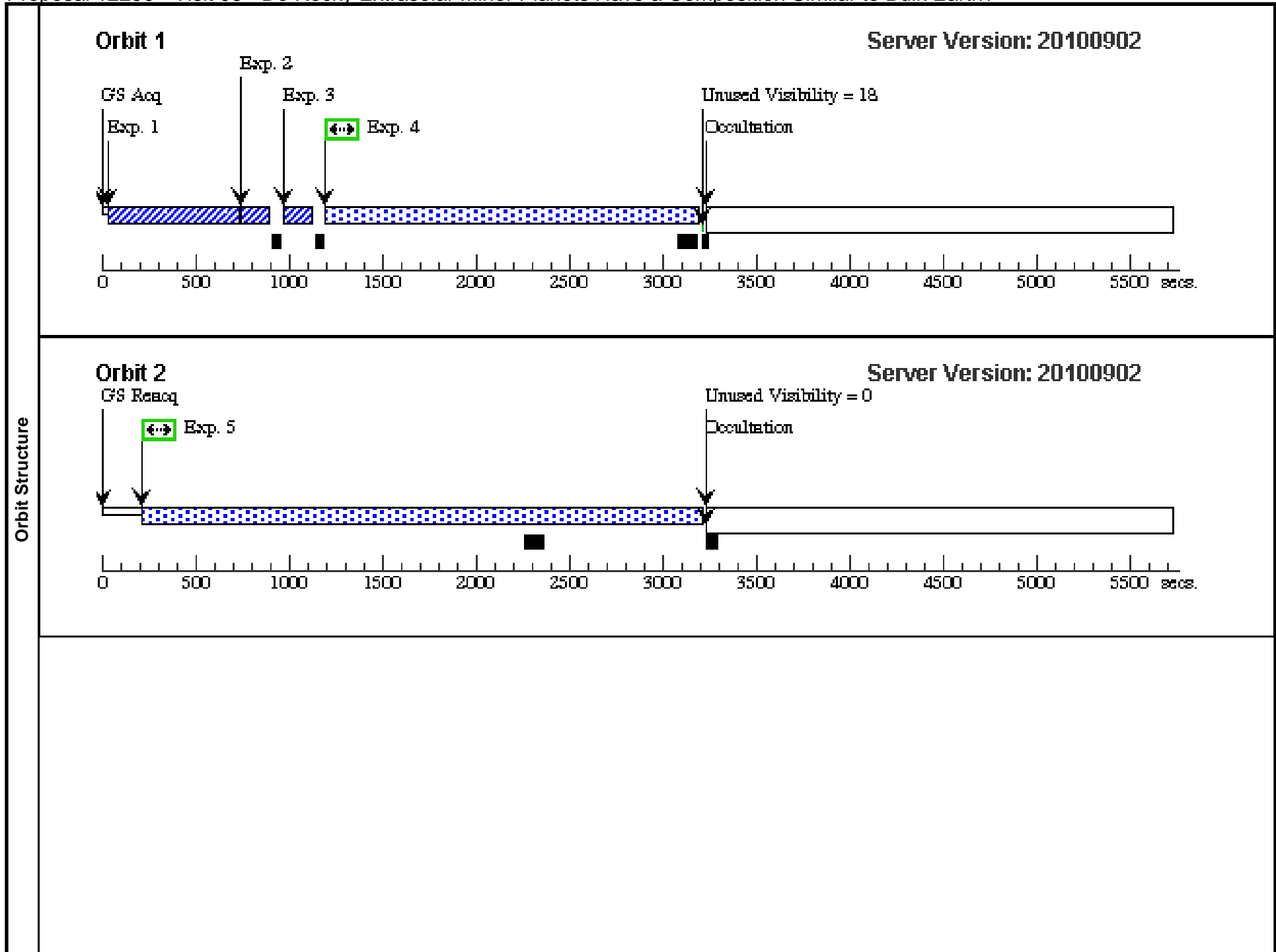
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	TA(ACQ/SEARCH)	(2) PG-1225-079	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=3			13.7 Secs [==>]	[1]
	2	TA(ACQ/IMAGE)	(2) PG-1225-079	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				13.7 Secs [==>]	[1]
	3	TA(ACQ/IMAGE)	(2) PG-1225-079	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				13.7 Secs [==>]	[1]
	4	PG 1225-079	(2) PG-1225-079	COS/NUV, TIME-TAG, PSA	G185M 1921 A	BUFFER-TIME=1705; FP-POS=3			2000 Secs [==>1805.0 Secs]	[1]

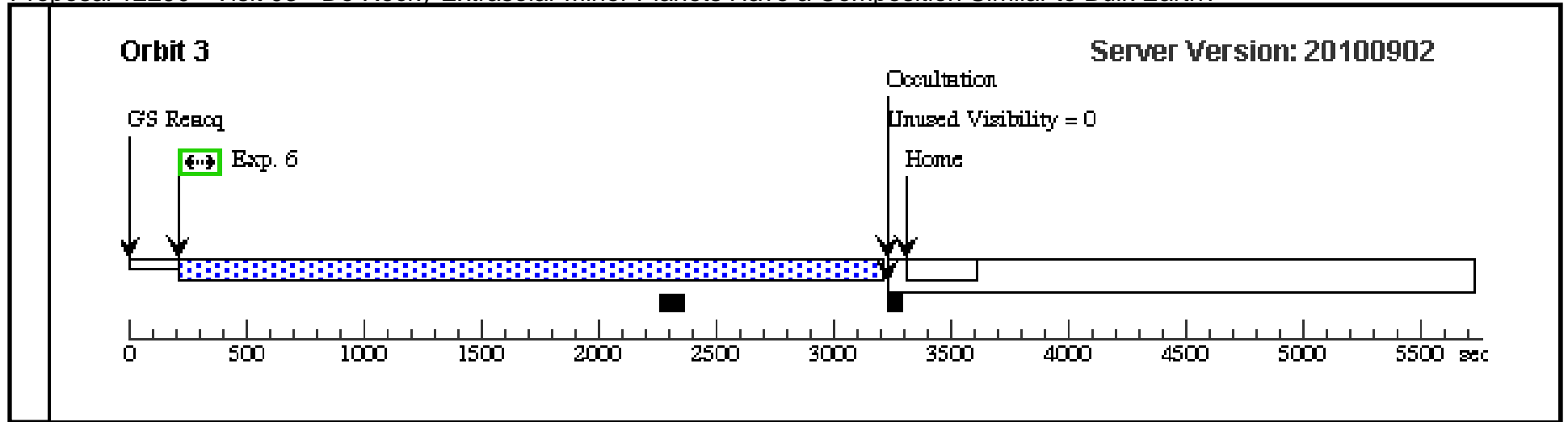


Proposal 12290 - Visit 03 - Do Rocky Extrasolar Minor Planets Have a Composition Similar to Bulk Earth?

Tue Feb 15 02:59:39 GMT 2011

Visit	Proposal 12290, Visit 03, implementation Diagnostic Status: No Diagnostics Scientific Instruments: COS/NUV, COS/FUV Special Requirements: (none)									
	Fixed Targets	# Name Target Coordinates Targ. Coord. Corrections Fluxes Miscellaneous (3) GD-40 RA: 03 02 53.1200 (45.7213333d) Dec: -01 08 33.50 (-1.14264d) Equinox: J2000 Epoch of Position: 2000 <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>								
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	TA(ACQ/SEARCH)	(3) GD-40	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=3			13.0 Secs [==>]	[1]
	2	TA(ACQ/IMAGE)	(3) GD-40	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				13.0 Secs [==>]	[1]
	3	TA(ACQ/IMAGE)	(3) GD-40	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				13.0 Secs [==>]	[1]
	4	GD 40	(3) GD-40	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=17 43; FP-POS=2			2000 Secs [==>1843.0 Secs]	[1]
	5	GD 40	(3) GD-40	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=20 08; FP-POS=3			2000 Secs [==>2948.0 Secs]	[2]
	6	GD 40	(3) GD-40	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=20 08; FP-POS=4			2000 Secs [==>2948.0 Secs]	[3]

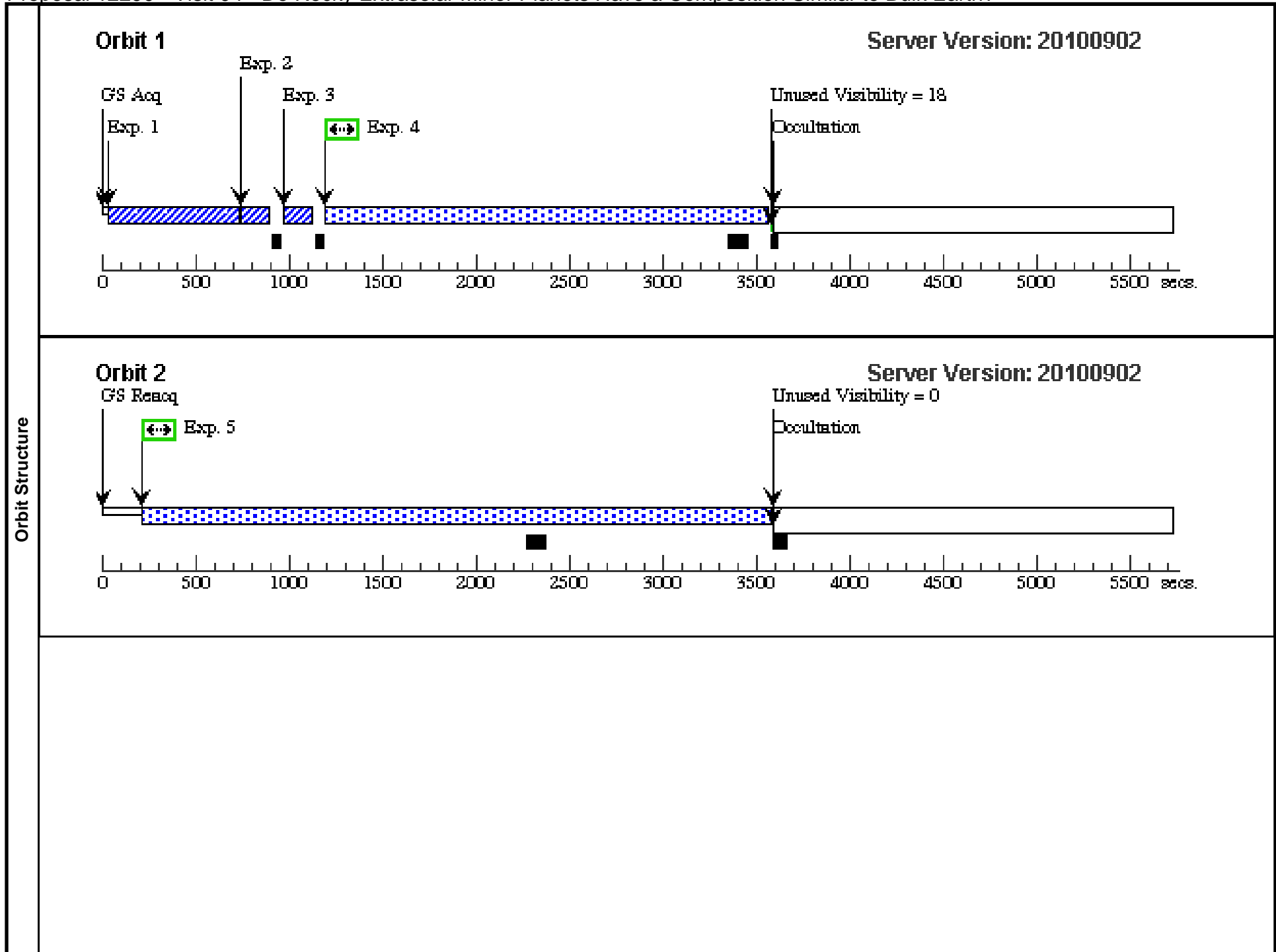


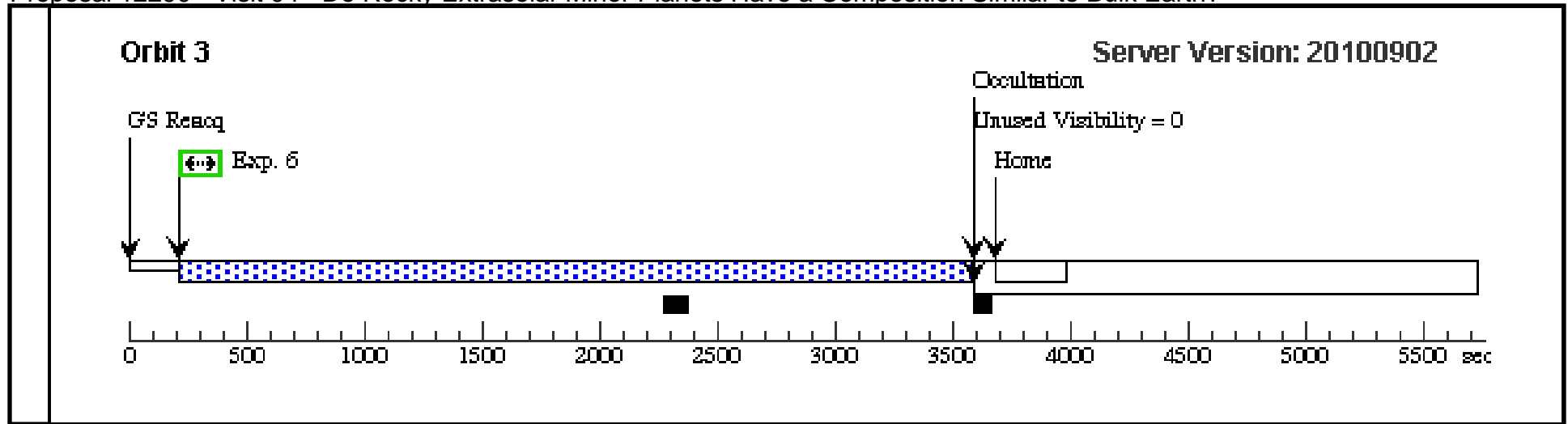


Proposal 12290 - Visit 04 - Do Rocky Extrasolar Minor Planets Have a Composition Similar to Bulk Earth?

Tue Feb 15 02:59:40 GMT 2011

Fixed Targets	#		Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(4)		G241-6	RA: 22 23 33.0800 (335.8878333d) Dec: +68 37 24.20 (68.62339d) Equinox: J2000	Proper Motion RA: 142 mas/yr Proper Motion Dec: 239 mas/yr Epoch of Position: 2000	V=15.7	Reference Frame: ICRS			
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	TA(ACQ/SEARCH)	(4) G241-6	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=3			13.0 Secs [==>]	[1]
	2	TA(ACQ/IMAGE)	(4) G241-6	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				13.0 Secs [==>]	[1]
	3	TA(ACQ/IMAGE)	(4) G241-6	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				13.0 Secs [==>]	[1]
	4	G 241-6	(4) G241-6	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=20 19; FP-POS=2			2000 Secs [==>2208.0 Secs]	[1]
	5	G 241-6	(4) G241-6	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=20 19; FP-POS=3			2000 Secs [==>3313.0 Secs]	[2]
	6	G 241-6	(4) G241-6	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=20 19; FP-POS=4			2000 Secs [==>3313.0 Secs]	[3]



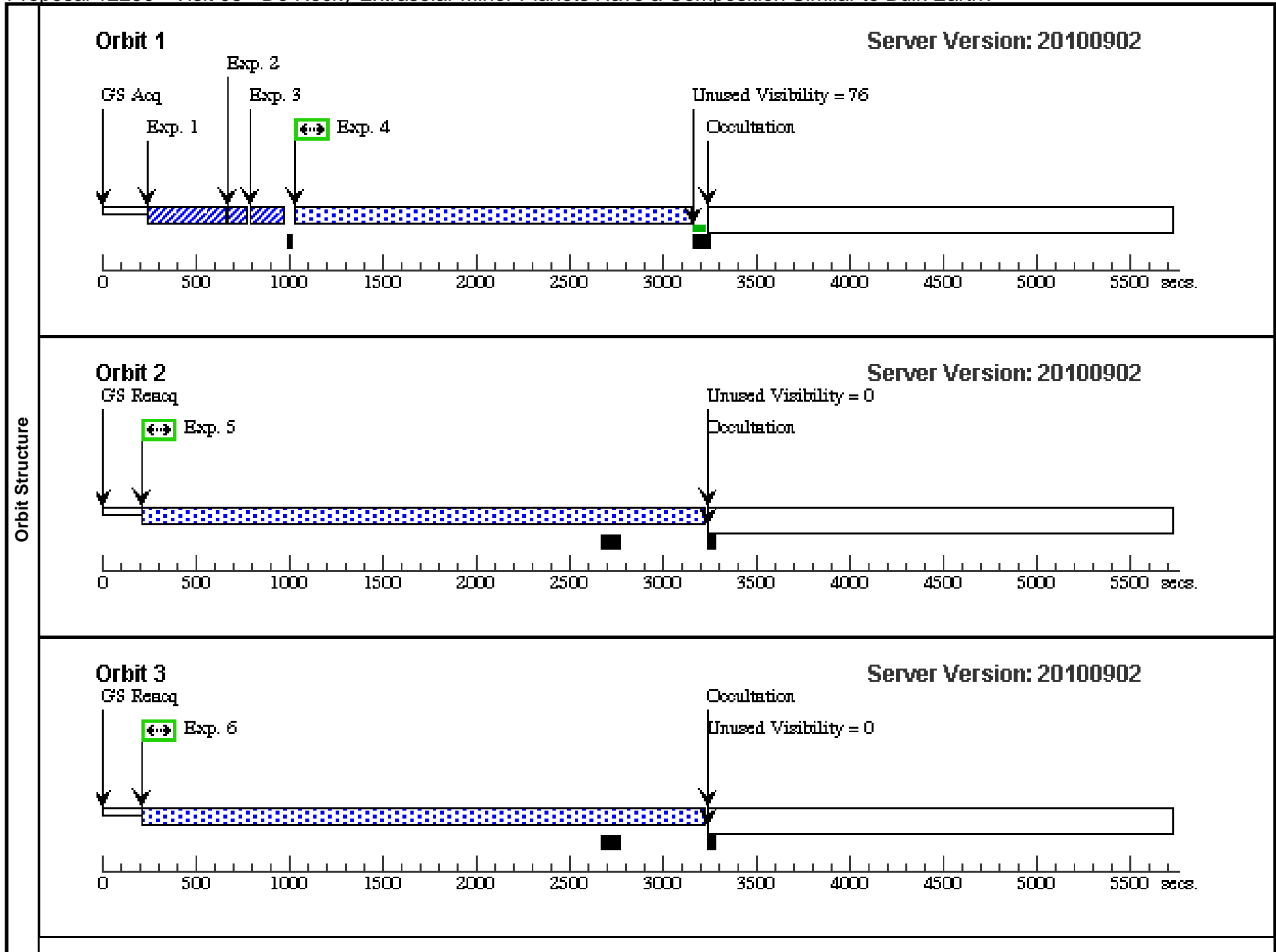


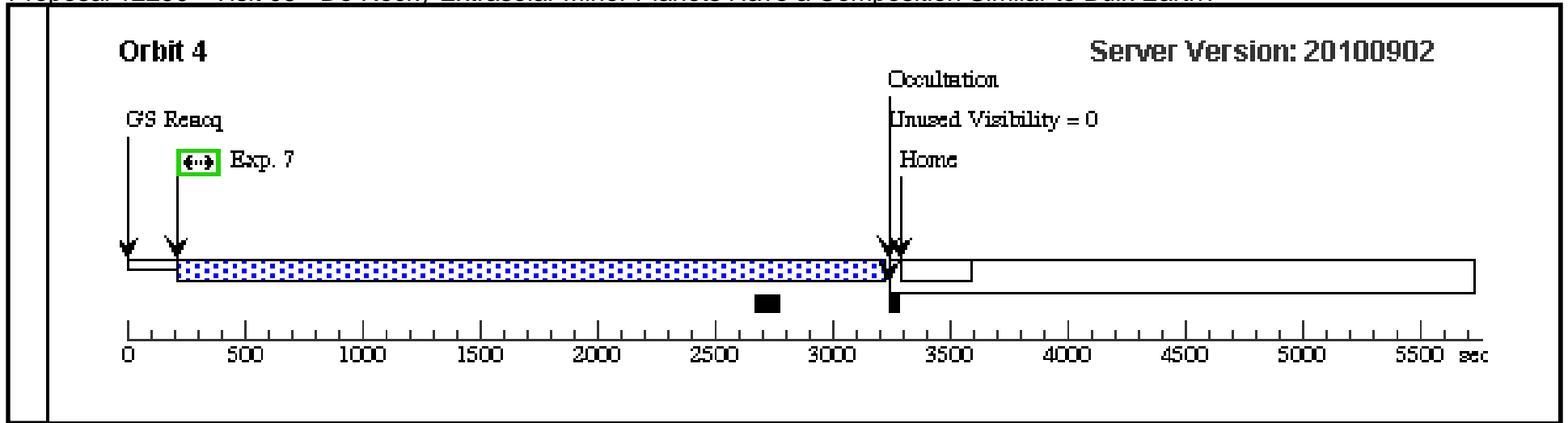
Proposal 12290 - Visit 05 - Do Rocky Extrasolar Minor Planets Have a Composition Similar to Bulk Earth?

Tue Feb 15 02:59:41 GMT 2011

Fixed Targets	#		Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous		
		(5)	G29-38		RA: 23 28 47.6310 (352.1984625d) Dec: +05 14 54.23 (5.24840d) Equinox: J2000	Proper Motion RA: -411 mas/yr Proper Motion Dec: -273 mas/yr Epoch of Position: 2000	V=13.03	Reference Frame: ICRS	
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	TA(ACQ/SEARCH)	(5) G29-38	COS/FUV, ACQ/SEARCH, PSA	G130M 1300 A	SCAN-SIZE=3			5.5 Secs [==>]	[1]
	2	TA(ACQ/EAKXD)	(5) G29-38	COS/FUV, ACQ/PEAKXD, PSA	G130M 1300 A				5.5 Secs [==>]	[1]
	3	TA(ACQ/EAKD)	(5) G29-38	COS/FUV, ACQ/PEAKD, PSA	G130M 1300 A	NUM-POS=5; STEP-SIZE=0.9			5.5 Secs [==>]	[1]
	4	G 29-38	(5) G29-38	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 20; FP-POS=1			2000 Secs [==>1999.0 Secs]	[1]
	5	G 29-38	(5) G29-38	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 20; FP-POS=2			2000 Secs [==>2956.0 Secs]	[2]
	6	G 29-38	(5) G29-38	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 20; FP-POS=3			2000 Secs [==>2956.0 Secs]	[3]
	7	G 29-38	(5) G29-38	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 20; FP-POS=4			2000 Secs [==>2956.0 Secs]	[4]

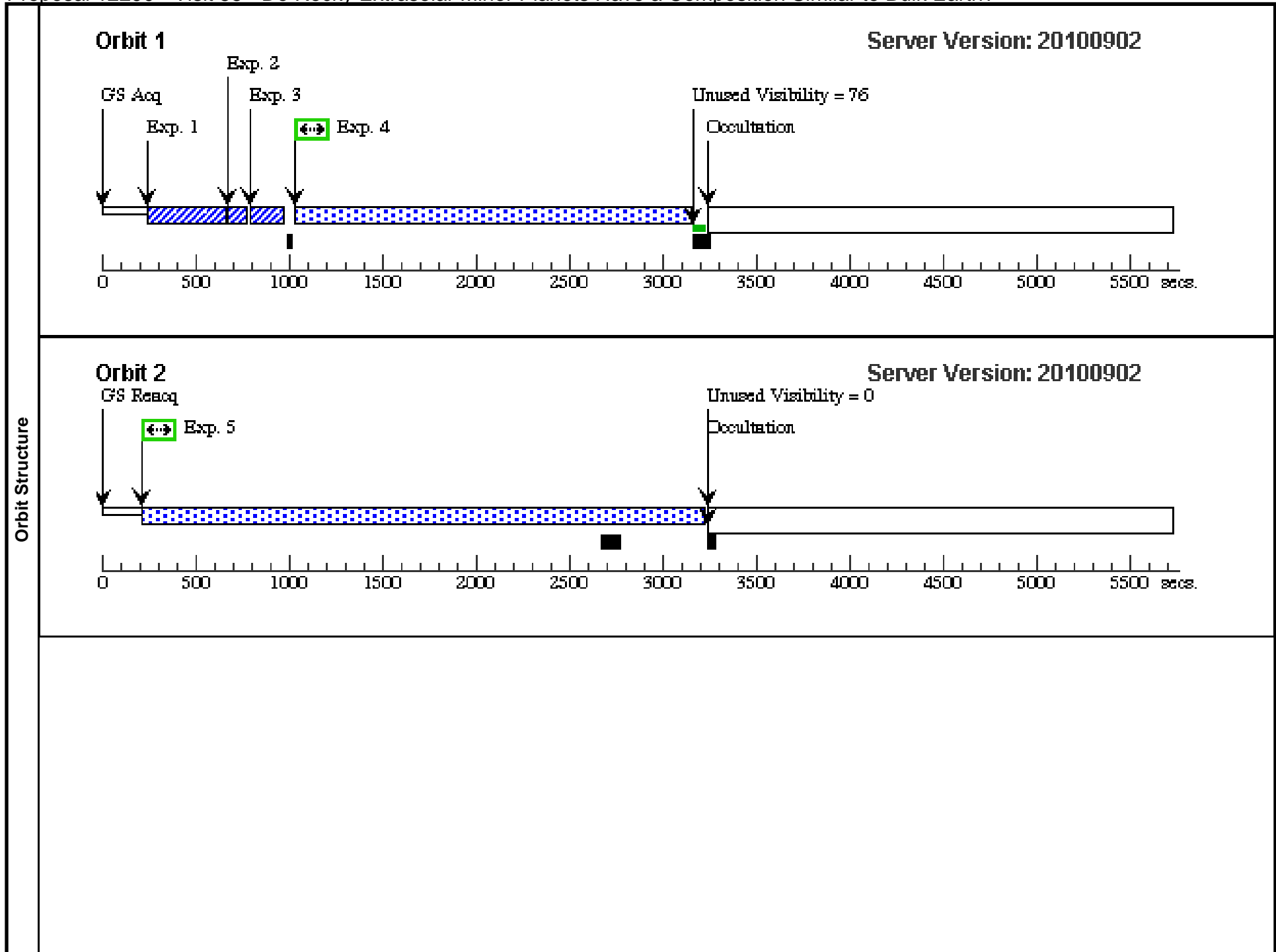


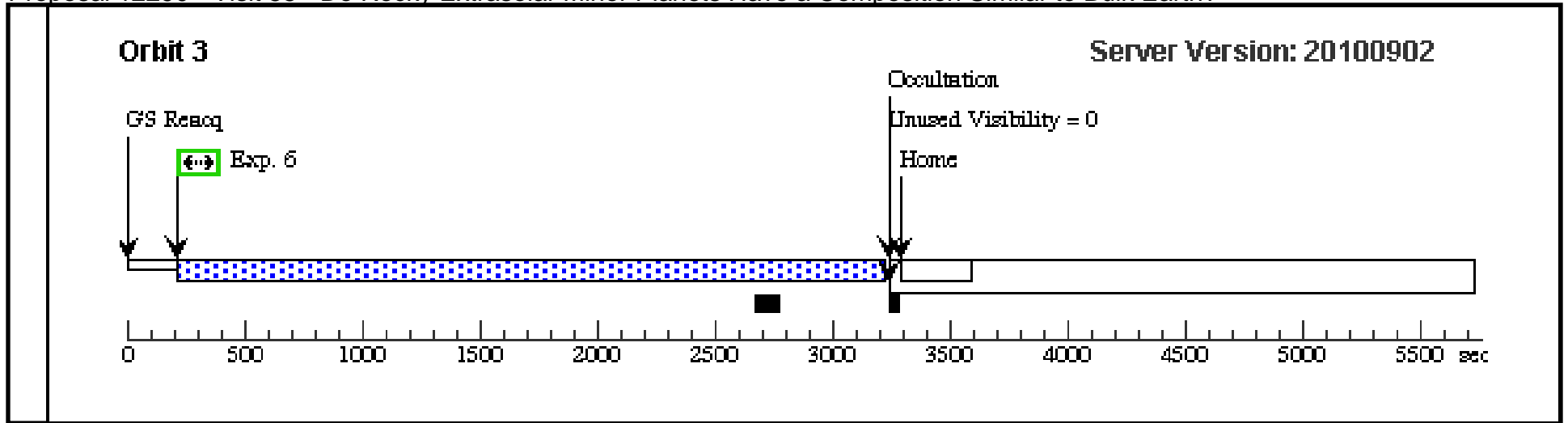


Proposal 12290 - Visit 55 - Do Rocky Extrasolar Minor Planets Have a Composition Similar to Bulk Earth?

Tue Feb 15 02:59:41 GMT 2011

Visit	Proposal 12290, Visit 55, completed Diagnostic Status: No Diagnostics Scientific Instruments: COS/FUV Special Requirements: (none)																																																																															
	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>(5)</td> <td>G29-38</td> <td>RA: 23 28 47.6310 (352.1984625d) Dec: +05 14 54.23 (5.24840d) Equinox: J2000</td> <td>Proper Motion RA: -411 mas/yr Proper Motion Dec: -273 mas/yr Epoch of Position: 2000</td> <td>V=13.03</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td colspan="6"><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i></td> </tr> </tbody> </table>										#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(5)	G29-38	RA: 23 28 47.6310 (352.1984625d) Dec: +05 14 54.23 (5.24840d) Equinox: J2000	Proper Motion RA: -411 mas/yr Proper Motion Dec: -273 mas/yr Epoch of Position: 2000	V=13.03	Reference Frame: ICRS	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>																																																								
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Exposures	<table border="1"> <thead> <tr> <th>#</th> <th>Label</th> <th>Target</th> <th>Config,Mode,Aperture</th> <th>Spectral Els.</th> <th>Opt. Params.</th> <th>Special Reqs.</th> <th>Groups</th> <th>Exp. Time/[Actual Dur.]</th> <th>Orbit</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TA(ACQ/SEARCH)</td> <td>(5) G29-38</td> <td>COS/FUV, ACQ/SEARCH, PSA</td> <td>G130M 1300 A</td> <td>SCAN-SIZE=3</td> <td></td> <td></td> <td>5.5 Secs [==>]</td> <td>[1]</td> </tr> <tr> <td>2</td> <td>TA(ACQ/EAKXD)</td> <td>(5) G29-38</td> <td>COS/FUV, ACQ/PEAKXD, PSA</td> <td>G130M 1300 A</td> <td></td> <td></td> <td></td> <td>5.5 Secs [==>]</td> <td>[1]</td> </tr> <tr> <td>3</td> <td>TA(ACQ/EAKD)</td> <td>(5) G29-38</td> <td>COS/FUV, ACQ/PEAKD, PSA</td> <td>G130M 1300 A</td> <td>NUM-POS=5; STEP-SIZE=0.9</td> <td></td> <td></td> <td>5.5 Secs [==>]</td> <td>[1]</td> </tr> <tr> <td>4</td> <td>G 29-38</td> <td>(5) G29-38</td> <td>COS/FUV, TIME-TAG, PSA</td> <td>G130M 1300 A</td> <td>BUFFER-TIME=24 20; FP-POS=1</td> <td></td> <td></td> <td>2000 Secs [==>1999.0 Secs]</td> <td>[1]</td> </tr> <tr> <td>5</td> <td>G 29-38</td> <td>(5) G29-38</td> <td>COS/FUV, TIME-TAG, PSA</td> <td>G130M 1300 A</td> <td>BUFFER-TIME=24 20; FP-POS=2</td> <td></td> <td></td> <td>2000 Secs [==>2956.0 Secs]</td> <td>[2]</td> </tr> <tr> <td>6</td> <td>G 29-38</td> <td>(5) G29-38</td> <td>COS/FUV, TIME-TAG, PSA</td> <td>G130M 1300 A</td> <td>BUFFER-TIME=24 20; FP-POS=3</td> <td></td> <td></td> <td>2000 Secs [==>2956.0 Secs]</td> <td>[3]</td> </tr> </tbody> </table>										#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit	1	TA(ACQ/SEARCH)	(5) G29-38	COS/FUV, ACQ/SEARCH, PSA	G130M 1300 A	SCAN-SIZE=3			5.5 Secs [==>]	[1]	2	TA(ACQ/EAKXD)	(5) G29-38	COS/FUV, ACQ/PEAKXD, PSA	G130M 1300 A				5.5 Secs [==>]	[1]	3	TA(ACQ/EAKD)	(5) G29-38	COS/FUV, ACQ/PEAKD, PSA	G130M 1300 A	NUM-POS=5; STEP-SIZE=0.9			5.5 Secs [==>]	[1]	4	G 29-38	(5) G29-38	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 20; FP-POS=1			2000 Secs [==>1999.0 Secs]	[1]	5	G 29-38	(5) G29-38	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 20; FP-POS=2			2000 Secs [==>2956.0 Secs]	[2]	6	G 29-38	(5) G29-38	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 20; FP-POS=3			2000 Secs [==>2956.0 Secs]	[3]
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit																																																																							
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2	TA(ACQ/EAKXD)	(5) G29-38	COS/FUV, ACQ/PEAKXD, PSA	G130M 1300 A				5.5 Secs [==>]	[1]																																																																							
3	TA(ACQ/EAKD)	(5) G29-38	COS/FUV, ACQ/PEAKD, PSA	G130M 1300 A	NUM-POS=5; STEP-SIZE=0.9			5.5 Secs [==>]	[1]																																																																							
4	G 29-38	(5) G29-38	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 20; FP-POS=1			2000 Secs [==>1999.0 Secs]	[1]																																																																							
5	G 29-38	(5) G29-38	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 20; FP-POS=2			2000 Secs [==>2956.0 Secs]	[2]																																																																							
6	G 29-38	(5) G29-38	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 20; FP-POS=3			2000 Secs [==>2956.0 Secs]	[3]																																																																							

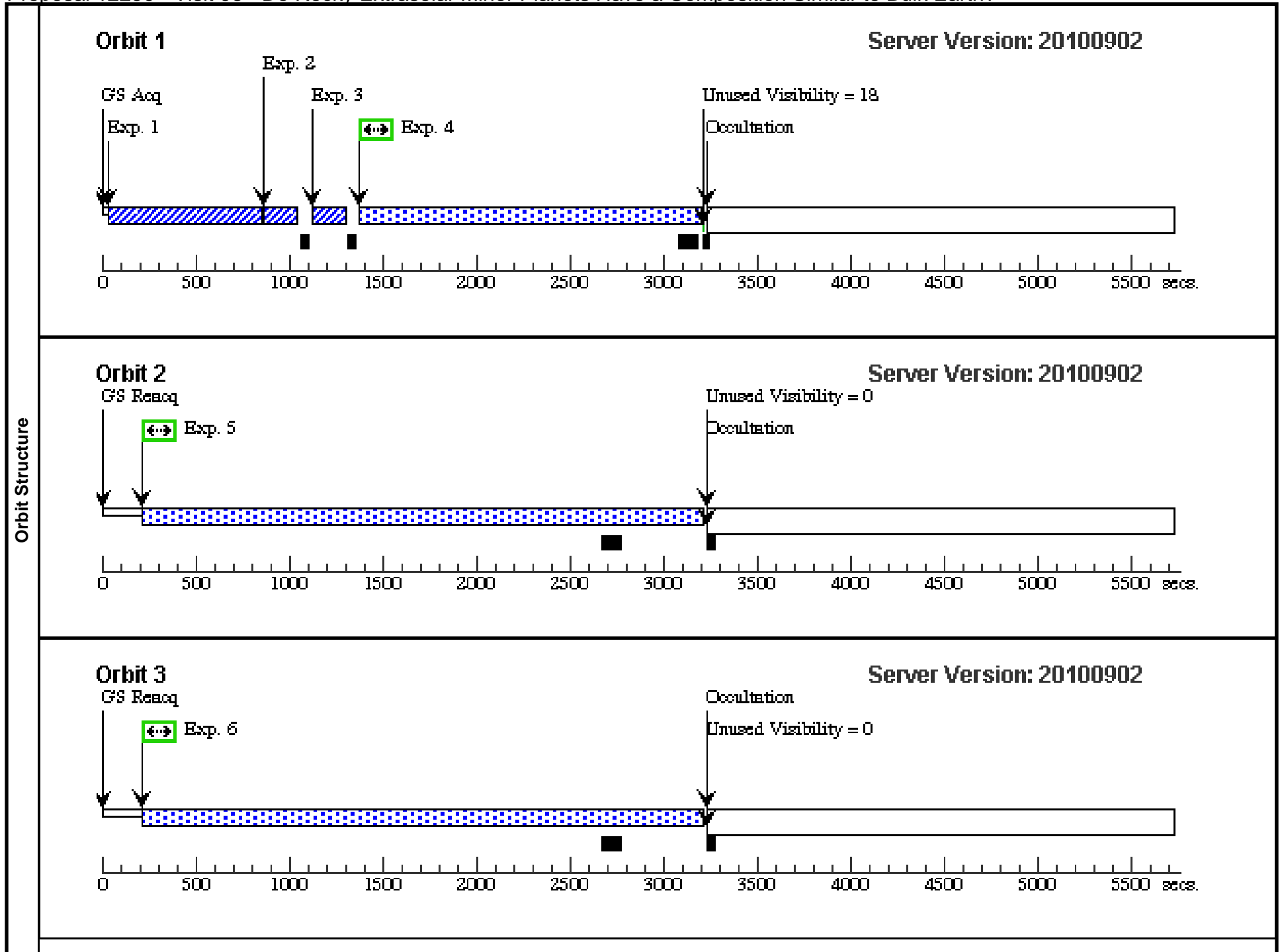




Proposal 12290 - Visit 06 - Do Rocky Extrasolar Minor Planets Have a Composition Similar to Bulk Earth?

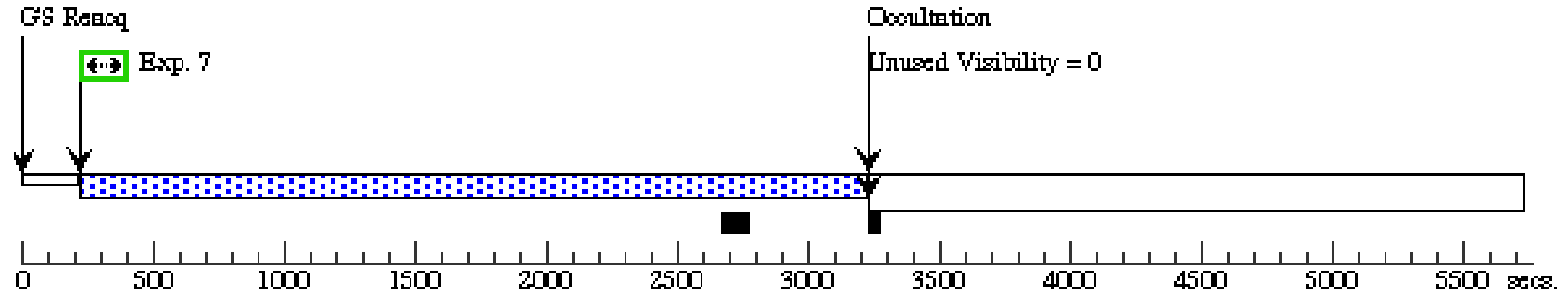
Tue Feb 15 02:59:42 GMT 2011

Visit	Proposal 12290, Visit 06, implementation Diagnostic Status: No Diagnostics Scientific Instruments: COS/NUV, COS/FUV Special Requirements: (none)									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(6)	GD-133	RA: 11 19 12.4000 (169.8016667d) Dec: +02 20 33.10 (2.34253d) Equinox: J2000	Proper Motion RA: -90 mas/yr Proper Motion Dec: 35 mas/yr Epoch of Position: 2000	V=14.57	Reference Frame: ICRS				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	TA(ACQ/SEARCH)	(6) GD-133	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=3			26.3 Secs [==>]	[1]
	2	TA(ACQ/IMAGE)	(6) GD-133	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				26.3 Secs [==>]	[1]
	3	TA(ACQ/IMAGE)	(6) GD-133	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				26.3 Secs [==>]	[1]
	4	GD 133	(6) GD-133	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=15 67; FP-POS=1			2000 Secs [==>1667.0 Secs]	[1]
	5	GD 133	(6) GD-133	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 27; FP-POS=2			2000 Secs [==>2948.0 Secs]	[2]
	6	GD 133	(6) GD-133	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 27; FP-POS=3			2000 Secs [==>2948.0 Secs]	[3]
	7	GD 133	(6) GD-133	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 27; FP-POS=3			2000 Secs [==>2948.0 Secs]	[4]
	8	GD 133	(6) GD-133	COS/FUV, TIME-TAG, PSA	G130M 1300 A	BUFFER-TIME=24 27; FP-POS=4			2000 Secs [==>2948.0 Secs]	[5]



Orbit 4

Server Version: 20100902



Orbit 5

Server Version: 20100902

