



15143 - Slow Rotating Trojans: Tidally Synchronized Binaries?

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) TR9807 | WFC3/UVIS | 1 | 25-Apr-2018 17:05:23.0 | yes |
| 02 | (2) TR15529 | WFC3/UVIS | 1 | 25-Apr-2018 17:05:25.0 | yes |
| 03 | (3) TR15977 | WFC3/UVIS | 1 | 25-Apr-2018 17:05:26.0 | yes |
| 04 | (4) TR22056 | WFC3/UVIS | 1 | 25-Apr-2018 17:05:28.0 | yes |
| 05 | (5) TR24357 | WFC3/UVIS | 1 | 25-Apr-2018 17:05:29.0 | yes |
| 06 | (6) TR65223 | WFC3/UVIS | 1 | 25-Apr-2018 17:05:30.0 | yes |

6 Total Orbits Used

ABSTRACT

We propose HST observations of six slow-rotating Trojans to search for tidally synchronous binaries similar to the Patroclus binary system. A significant excess of slow rotators over Maxwellian suggests that additional binaries may be present. If any of the targets are binary, they can be resolved by HST. This target selection strategy has recently yielded the third known resolved Trojan binary, detected in a sample of seven slow-

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rotating Trojans. We wish to extend this successful strategy with another similarly selected sample. Even one additional resolved binary in the Trojans, which would become the fourth, would be of extreme interest. The discovery of no binaries among this group of slow rotators would challenge the understanding of the source of the excess slow rotators in the Trojans.

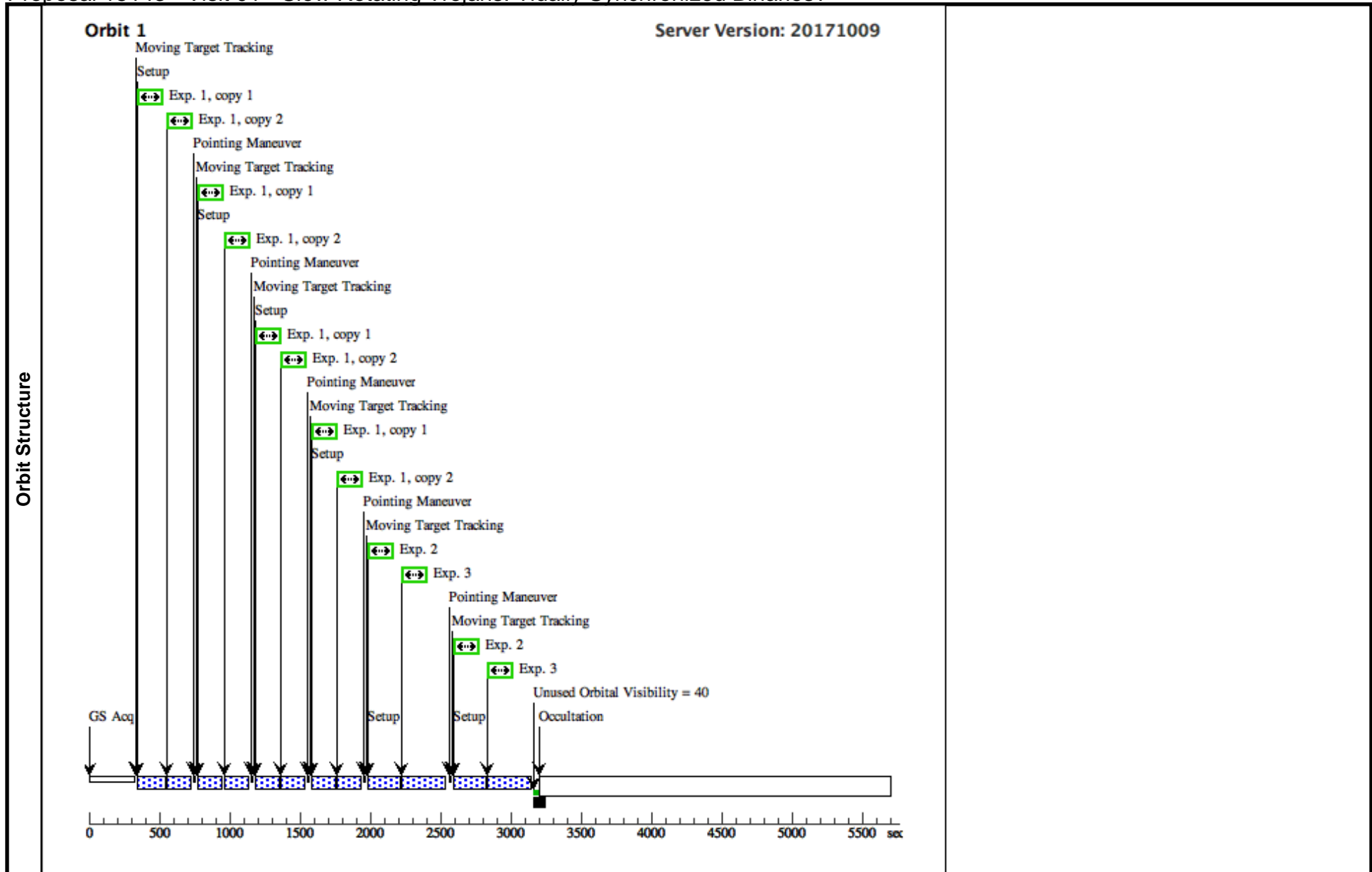
OBSERVING DESCRIPTION

Single orbit visits for each target. Box dither. Exposures times calculated to reach half-full well.

Proposal 15143 - Visit 01 - Slow Rotating Trojans: Tidally Synchronized Binaries?

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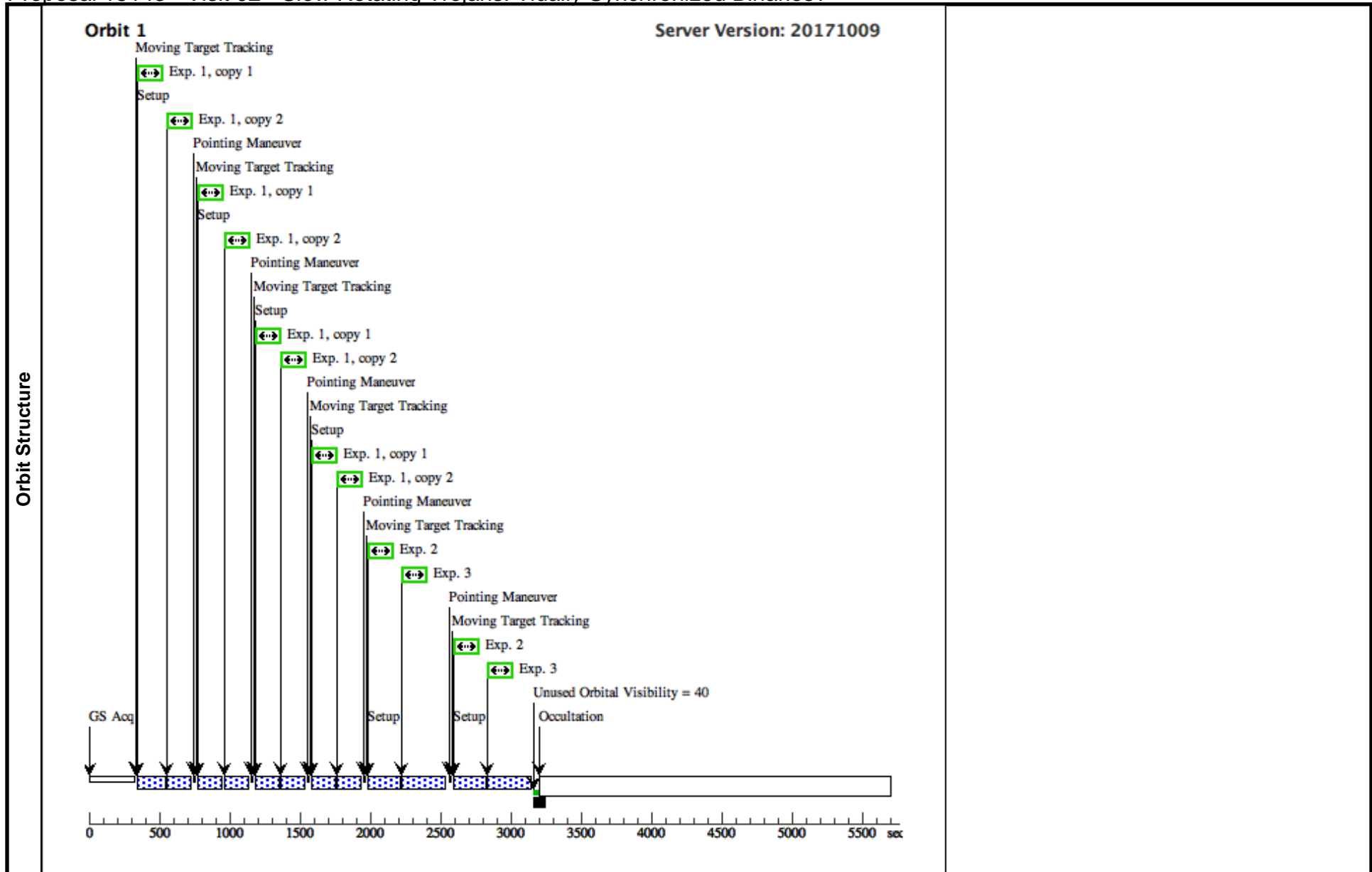
| Visit | Proposal 15143, Visit 01, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none) | | | | | | | | | |
|----------------------|--|--|---|-----------------------------------|---------------|----------------------------|---------------|-------------------------------------|---|-------|
| | # | Primary Pattern | Secondary Pattern | | | | Exposures | | | |
| Patterns | (1) | Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112 | Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false | | | | (1) | | | |
| | (2) | Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false | | | | (2-3) | | | |
| Solar System Targets | # | Name | Level 1 | Level 2 | Level 3 | Window | Ephem Center | | | |
| | (1) | TR9807 | TYPE=ASTEROID,A=5.20450429446 0548,E=0.1551711118777424,I=4.972 076550184915,O=232.587756809332, W=196.4924239097345,M=31.062900 9294033,EQUINOX=J2000,EPOCH= 01-JAN- 2012:00:00:00,EpochTimeScale=TDB Comments: Extended=NO | | | RANGE TR9807 EARTH LT 5.26 | EARTH | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | (1) TR9807 | (1) TR9807 | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F555W | FLASH=8 | | Pattern 1, Exps 1-1 in Visit 01 (1) | 120 Secs X 2 (960 Secs) [==>(Pattern 1, Copy 1)] [==>(Pattern 1, Copy 2)] [==>(Pattern 2, Copy 1)] [==>(Pattern 2, Copy 2)] [==>(Pattern 3, Copy 1)] [==>(Pattern 3, Copy 2)] [==>(Pattern 4, Copy 1)] [==>(Pattern 4, Copy 2)] | [1] |
| | 2 | (1) TR9807 | (1) TR9807 | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F814W | FLASH=11 | | Pattern 2, Exps 2-3 in Visit 01 (2) | 160 Secs (320 Secs) [==>(Pattern 1)] [==>(Pattern 2)] | [1] |
| | 3 | (1) TR9807 | (1) TR9807 | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F438W | FLASH=11 | | Pattern 2, Exps 2-3 in Visit 01 (2) | 240 Secs (480 Secs) [==>(Pattern 1)] [==>(Pattern 2)] | [1] |



Proposal 15143 - Visit 02 - Slow Rotating Trojans: Tidally Synchronized Binaries?

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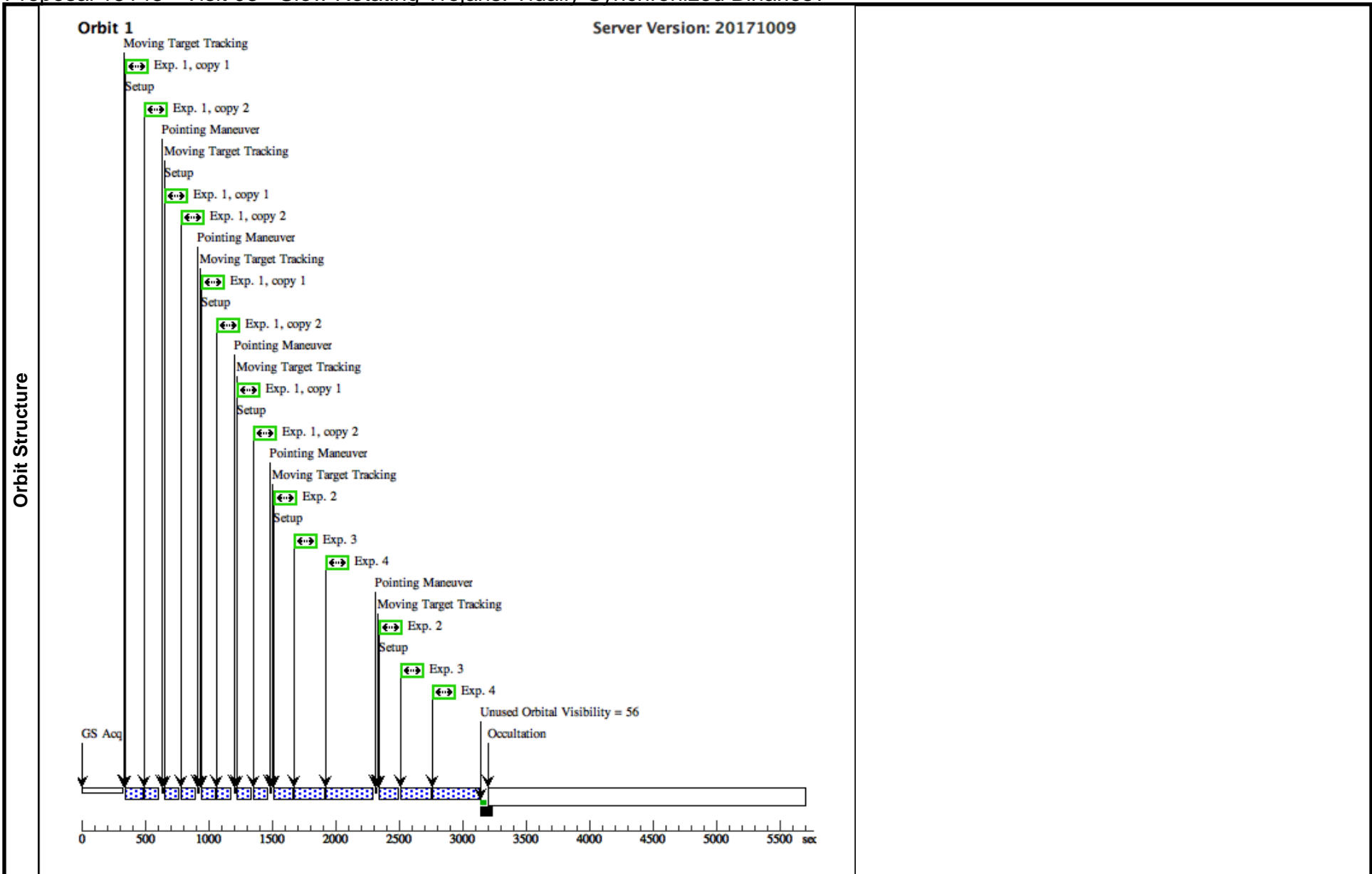
| Visit | Proposal 15143, Visit 02, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none) | | | | | | | | | |
|----------------------|--|--|---|-----------------------------------|---------------|-----------------------------|-------------------------|-------------------------------------|---|-------|
| | # | Primary Pattern | Secondary Pattern | | | | Exposures | | | |
| Patterns | (1) | Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112 | Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false | | | | (1) | | | |
| | (2) | Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false | | | | (2-3) | | | |
| Solar System Targets | # | Name | Level 1 | Level 2 | Level 3 | Window | Ephem Center | | | |
| | (2) | TR15529 | TYPE=ASTEROID,A=5.25289340278 0781,E=0.02497769135976335,I=5.08 60599155504,O=169.5546284517102, W=85.50087180896146,M=203.25994 75031844,EQUINOX=J2000,EPOCH =29-SEP- 2011:00:00:00,EpochTimeScale=TDB <i>Comments: Extended=NO</i> | | | RANGE TR15529 EARTH LT 4.57 | EARTH | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | (2) TR15529 | | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F555W | FLASH=8 | GS ACQ SCENARIO BASE1B3 | Pattern 1, Exps 1-1 in Visit 02 (1) | 120 Secs X 2 (960 Secs) [==>(Pattern 1, Copy 1)] [==>(Pattern 1, Copy 2)] [==>(Pattern 2, Copy 1)] [==>(Pattern 2, Copy 2)] [==>(Pattern 3, Copy 1)] [==>(Pattern 3, Copy 2)] [==>(Pattern 4, Copy 1)] [==>(Pattern 4, Copy 2)] | [1] |
| | 2 | (2) TR15529 | | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F814W | FLASH=11 | | Pattern 2, Exps 2-3 in Visit 02 (2) | 160 Secs (320 Secs) [==>(Pattern 1)] [==>(Pattern 2)] | [1] |
| | 3 | (2) TR15529 | | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F438W | FLASH=11 | | Pattern 2, Exps 2-3 in Visit 02 (2) | 240 Secs (480 Secs) [==>(Pattern 1)] [==>(Pattern 2)] | [1] |



Proposal 15143 - Visit 03 - Slow Rotating Trojans: Tidally Synchronized Binaries?

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| Visit | Proposal 15143, Visit 03, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none) | | | | | | | | | |
|----------------------|---|--|--|-----------------------------------|---------------|-----------------------------|---------------|-------------------------------------|--|-------|
| | # | Primary Pattern | Secondary Pattern | | | | Exposures | | | |
| Patterns | (1) | Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112 | Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false | | | | (1) | | | |
| | (2) | Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false | | | | (2-4) | | | |
| Solar System Targets | # | Name | Level 1 | Level 2 | Level 3 | Window | Ephem Center | | | |
| | (3) | TR15977 | TYPE=ASTEROID,A=5.19721337516 4576,E=0.0490090645058245,I=17.33 023721934153,O=209.5745460604838 ,W=227.2792597752479,M=250.0572 315141619,EQUINOX=J2000,EPOCH =04-MAR- 2012:00:00:00,EpochTimeScale=TDB <i>Comments: Extended=NO</i> | | | RANGE TR15977 EARTH LT 4.57 | EARTH | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | (3) TR15977 | (3) TR15977 | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F555W | FLASH=11 | | Pattern 1, Exps 1-1 in Visit 03 (1) | 60 Secs X 2 (480 Secs) [=>(Pattern 1, Copy 1)] [=>(Pattern 1, Copy 2)] [=>(Pattern 2, Copy 1)] [=>(Pattern 2, Copy 2)] [=>(Pattern 3, Copy 1)] [=>(Pattern 3, Copy 2)] [=>(Pattern 4, Copy 1)] [=>(Pattern 4, Copy 2)] | [1] |
| | 2 | (3) TR15977 | (3) TR15977 | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F814W | FLASH=11 | | Pattern 2, Exps 2-4 in Visit 03 (2) | 80 Secs (160 Secs) [=>(Pattern 1)] [=>(Pattern 2)] | [1] |
| | 3 | (3) TR15977 | (3) TR15977 | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F438W | FLASH=11 | | Pattern 2, Exps 2-4 in Visit 03 (2) | 160 Secs (320 Secs) [=>(Pattern 1)] [=>(Pattern 2)] | [1] |
| | 4 | (3) TR15977 | (3) TR15977 | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F336W | FLASH=11 | | Pattern 2, Exps 2-4 in Visit 03 (2) | 300 Secs (600 Secs) [=>(Pattern 1)] [=>(Pattern 2)] | [1] |



Proposal 15143 - Visit 04 - Slow Rotating Trojans: Tidally Synchronized Binaries?

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| Visit | Proposal 15143, Visit 04, implementation | | | Diagnostic Status: No Diagnostics | | | Scientific Instruments: WFC3/UVIS | | | Special Requirements: (none) | | |
|----------------------|--|---|--|-----------------------------------|---------------|-----------------------------|-----------------------------------|-------------------------------------|---|------------------------------|--|--|
| | # | Primary Pattern | Secondary Pattern | Exposures | | | | | | | | |
| Patterns | (1) | Pattern Type=WFC3-UVIS-DITHER-BOX Coordinate Frame=POS-TARG Pattern Orientation=23.884 Purpose=DITHER Angle Between Sides=81.785 Number Of Points=4 Center Pattern=false Point Spacing=0.173 Line Spacing=0.112 | | (1) | | | | | | | | |
| | (2) | Pattern Type=WFC3-UVIS-DITHER-LINE Coordinate Frame=POS-TARG Pattern Orientation=46.84 Purpose=DITHER Angle Between Sides= Number Of Points=2 Center Pattern=false Point Spacing=0.145 Line Spacing= | | (2-3) | | | | | | | | |
| Solar System Targets | # | Name | Level 1 | Level 2 | Level 3 | Window | Ephem Center | | | | | |
| | (4) | TR22056 | TYPE=ASTEROID,A=5.12507434794 4673,E=0.1469340828186335,I=7.206 649691565718,O=35.8489622918683, W=342.0385141951215,M=90.835106 89501728,EQUINOX=J2000,EPOCH =27-NOV- 2011:00:00:00,EpochTimeScale=TDB Comments: Extended=NO | | | RANGE TR22056 EARTH LT 4.27 | EARTH | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit | | |
| | 1 | (4) TR22056 | | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F555W | FLASH=11 | | Pattern 1, Exps 1-1 in Visit 04 (1) | 120 Secs X 2 (960 Secs) [==>(Pattern 1, Copy 1)] [==>(Pattern 1, Copy 2)] [==>(Pattern 2, Copy 1)] [==>(Pattern 2, Copy 2)] [==>(Pattern 3, Copy 1)] [==>(Pattern 3, Copy 2)] [==>(Pattern 4, Copy 1)] [==>(Pattern 4, Copy 2)] | [1] | | |
| | 2 | (4) TR22056 | | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F814W | FLASH=11 | | Pattern 2, Exps 2-3 in Visit 04 (2) | 160 Secs (320 Secs) [==>(Pattern 1)] [==>(Pattern 2)] | [1] | | |
| | 3 | (4) TR22056 | | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F438W | FLASH=11 | | Pattern 2, Exps 2-3 in Visit 04 (2) | 240 Secs (480 Secs) [==>(Pattern 1)] [==>(Pattern 2)] | [1] | | |

Proposal 15143 - Visit 05 - Slow Rotating Trojans: Tidally Synchronized Binaries?

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| Visit | Proposal 15143, Visit 05, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none) | | | | | | | | | |
|----------------------|--|--|--|-----------------------------------|---------------|-----------------------------|---------------|-------------------------------------|--|-------|
| | # | Primary Pattern | Secondary Pattern | | | | Exposures | | | |
| Patterns | (1) | Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112 | Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false | | | | (1) | | | |
| | (2) | Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false | | | | (2) | | | |
| Solar System Targets | # | Name | Level 1 | Level 2 | Level 3 | Window | Ephem Center | | | |
| | (5) | TR24357 | TYPE=ASTEROID,A=5.31863674724 6728,E=0.06319678166431013,I=8.80 5650491327439,O=244.679433028077 6,W=194.7538652953234,M=14.2521 4795015524,EQUINOX=J2000,EPOC H=21-AUG- 2011:00:00:00,EpochTimeScale=TDB Comments: Extended=NO | | | RANGE TR24357 EARTH LT 5.05 | EARTH | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | (5) TR24357 | (5) TR24357 | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F555W | FLASH=5 | | Pattern 1, Exps 1-1 in Visit 05 (1) | 300 Secs (1200 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)] | [1] |
| 2 | (5) TR24357 | (5) TR24357 | (5) TR24357 | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F814W | FLASH=2 | | Pattern 2, Exps 2-2 in Visit 05 (2) | 500 Secs (1000 Secs) [==>(Pattern 1)] [==>(Pattern 2)] | [1] |

Proposal 15143 - Visit 06 - Slow Rotating Trojans: Tidally Synchronized Binaries?

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| Visit | Proposal 15143, Visit 06, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none) | | | | | | | | | |
|----------------------|--|-------------|--|---|---------------|-----------------------------|---------------|-----------------------------|---|-------|
| | Patterns | # | Primary Pattern | Secondary Pattern | Exposures | | | | | |
| | | (1) | Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112 | Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false | | (1) | | | | |
| Solar System Targets | # | Name | Level 1 | Level 2 | Level 3 | Window | Ephem Center | | | |
| | (6) | TR65223 | TYPE=ASTEROID,A=5.25022809700 0153,E=0.07246697807575307,I=6.96 2848905424069,O=32.2532965737641 3,W=101.7155086898161,M=6.43219 263114457,EQUINOX=J2000,EPOCH =19-APR- 2013:00:00:00,EpochTimeScale=TDB | | | RANGE TR65223 EARTH LT 5.07 | EARTH | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
| | 1 | | (6) TR65223 | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F555W | | | | Pattern 1, Exps 1-1 in Visit 06 (1) 450 Secs (1800 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)] | [1] |
| 2 | | (6) TR65223 | WFC3/UVIS, ACCUM, UVIS2-M512C-SUB | F814W | FLASH=2 | | | 550 Secs (550 Secs) [=>] | [1] | |

