# 14221 - HST Confirmation and Characterization of a Potentially Habitable World

Cycle: 23, Proposal Category: GO

(UV Initiative)

(Availability Mode: AVAILABLE)

**INVESTIGATORS**



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|---|---|---|
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**VISITS**

| *Visit* | *Targets used in Visit* | *Configurations used in Visit* | *Orbits Used* | *Last Orbit Planner Run* | *OP Current with Visit?* |
|---|---|---|---|---|---|
| 01 | (1) 2M11301450+0735180<br>WAVE | STIS/CCD<br>STIS/FUV-MAMA | 5 | 01-Feb-2018 17:02:06.0 | yes |
| 11 | (1) 2M11301450+0735180<br>WAVE | STIS/CCD<br>STIS/FUV-MAMA | 5 | 01-Feb-2018 17:02:09.0 | yes |
| 21 | (1) 2M11301450+0735180<br>WAVE | STIS/CCD<br>STIS/FUV-MAMA | 4 | 01-Feb-2018 17:02:12.0 | yes |

14 Total Orbits Used

**ABSTRACT**

Atmospheric characterization of exoplanets in habitable zones is one of the greatest challenge of astrophysics. In fact, all known potential targets either do not transit, or they transit stars too faint or distant, making them impossible to probe with transit spectroscopy. A recently announced K2 planet candidate found in the habitable zone of a nearby M dwarf, could be a game changer as the first habitable-zone super-Earth (2.2 R_Earth) amenable to characterization. We propose to use HST to (1) validate the planet candidate by observing a high-precision near-infrared transit with WFC3 and (2) characterize its atmosphere by detecting an extended hydrogen exosphere in the far ultraviolet with STIS. Hydrogen escape is indeed a telltale sign of terrestrial planets enduring a runaway greenhouse effect. Further considerations on the habitable potential of the planet thus need to be vet against a detection of hydrogen escape. Our recent STIS Lyman-alpha observations of a moderately irradiated neptune show that extended upper atmospheres can reach much larger sizes around such planets than around very hot exoplanets. We could thus obtain a significant detection with a modest amount of HST orbits. In parallel, we started a ground-based campaign to constrain the yet unknown mass of this planet with Doppler measurements. Combining the Lyman-alpha transit depth with the measurement of the planet bulk density (from the accurate near-infrared transit and the Doppler mass), will reveal for the first time whether an exoplanet can be telluric and actually habitable, or if it is losing its water because of a runaway greenhouse effect.

**OBSERVING DESCRIPTION**

We are going to observe one transit of exoplanet EPIC 201912552.01, which lies in the habitable zone of its M dwarf host. The planet was found by the K2 survey; and two transits are known, yielding some uncertainties on the planet transit ephemeride. We use the ephemeride to impose phase constraints on the first (ACQ) exposure of the first orbit in the visit. These constraints are set to allow observation of 2 orbits before the transit, 2 orbits after the transit, and one orbit (the third one) within the optical transit of the planet. The UV transit can be much longer than the optical transit, and orbits 2 and 4 could catch an extended transit. We are submitted a Spitzer DDT to observe a NIR transit, which could significantly firm up the transit ephemeride (this was the original purpose of another WFC3 visit in this programme, which has been removed by the TAC).

The science observations are all done with STIS/FUV-MAM/G140M using time-tag mode. Because the ACQ/PEAK is quite long, we won't repeat it in the subsequent orbits to save science time. I will also make a request to be able to use GO wavecals during occultations.

## Visit

**Proposal 14221, STIS/FUV (01), failed** Thu Feb 01 22:02:13 GMT 2018

**Diagnostic Status: Warning**

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: Period 32.939700 D AND ZERO-PHASE HJD2457264.391819

*Comments: This 5-orbit visit will capture the transit of the planet using STIS/FUV-MAMA.*

## Diagnostics

(STIS/FUV (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(STIS/FUV (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(STIS/FUV (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(STIS/FUV (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(STIS/FUV (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Science (01.003)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Science (01.005)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Science (01.007)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Science (01.009)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Science (01.011)) Warning (Form): Sensitive exposures should have an ETC run number provided.

## Fixed Targets

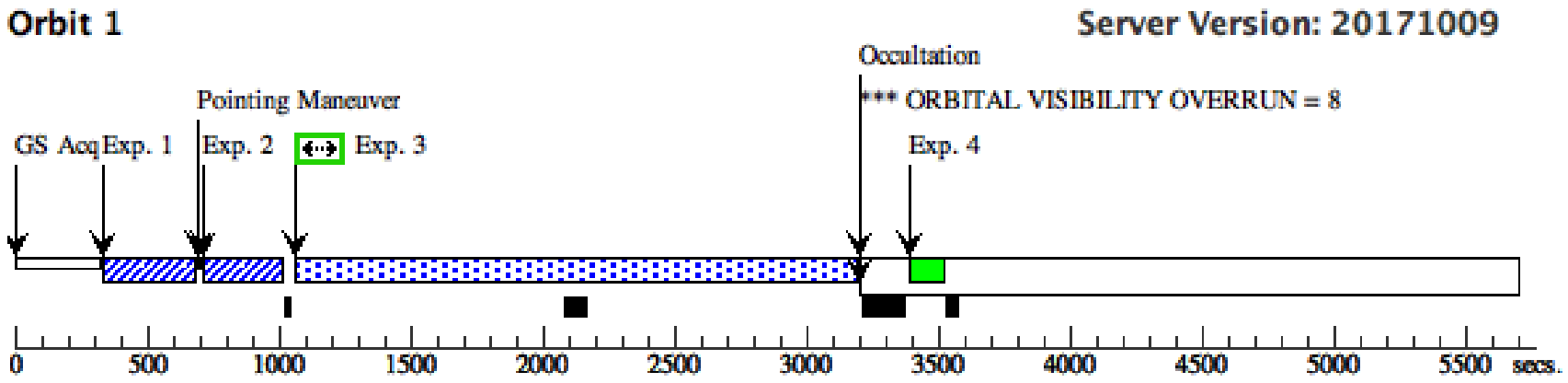
| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | 2M11301450+0735180<br>Alt Name1: EPIC201912552<br>Alt Name2: 2MASS11301450+0735180 | RA: 11 30 14.5092 (172.5604550d)<br>Dec: +07 35 18.05 (7.58835d)<br>Equinox: J2000 | Proper Motion RA: -74 mas/yr<br>Proper Motion Dec: -122 mas/yr<br>Epoch of Position: 2000 | V=13.5+/-0.05<br>J=9.76,<br>H=9.13,<br>K=8.90 | Reference Frame: ICRS |

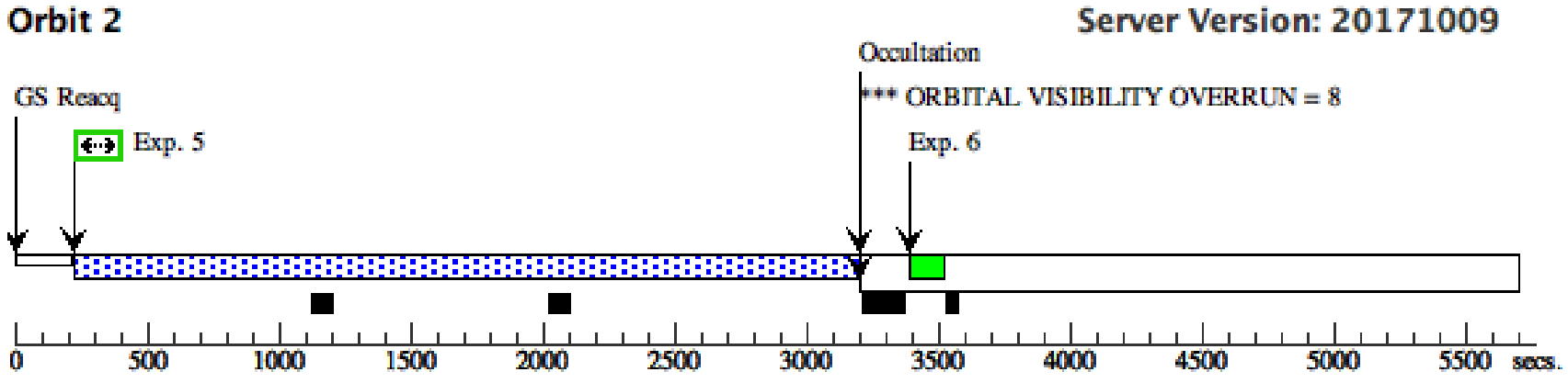
*Comments: This object was generated by the targetselector and retrieved from the 2MASS database. It's also part of the K2 Ecliptic Plan Input Catalog. None of those data bases list proper motions. However, we will be able to retrieve those from contemporaneous observations we are doing from the ground to follow-up the system. We will update the Phase 2 as soon as possible with these information.*
*Category=STAR*
*Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]*
*Extended=NO*

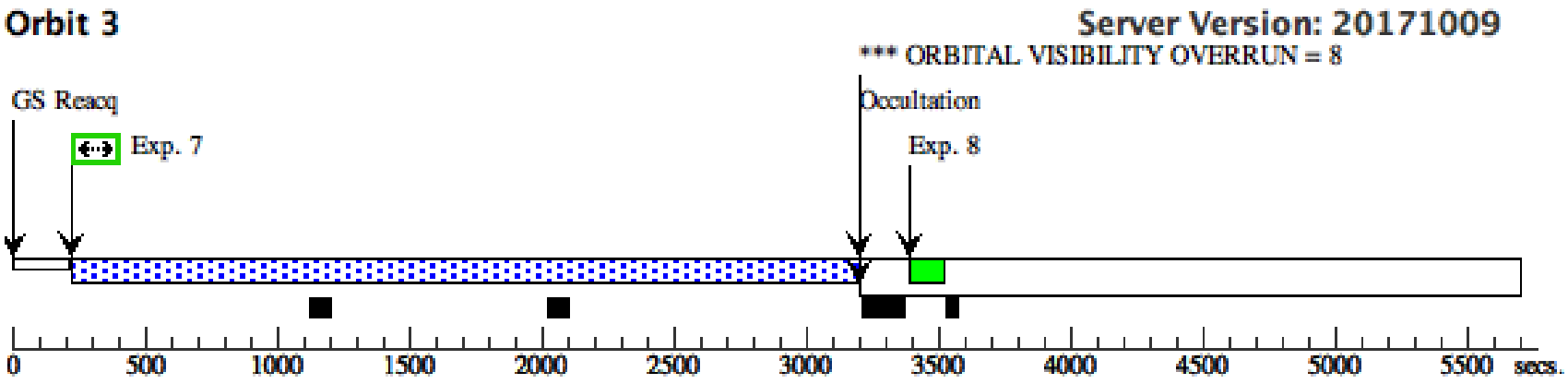
## Exposures

| # | Label (ETC Run) | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ACQ (STIS.ta.733994) | (1) 2M11301450+0735180 | STIS/CCD, ACQ, F25ND3 | MIRROR | | PHASE 0.9942 TO 0.9966 | Sequence 1-4 Non-Int in STIS/FUV (01) | 14 Secs (14 Secs)<br>*[==>]* | ***[1]*** |
| | *Comments: 14s allows to obtain S/N > 50 for this acquisition exposure.* | | | | | | | | |
| 2 | ACQ/PEAK (STIS.ta.771489) | (1) 2M11301450+0735180 | STIS/CCD, ACQ/PEAK, 52X0.05 | MIRROR | | | Sequence 1-4 Non-Int in STIS/FUV (01) | 1 Secs (1 Secs)<br>*[==>]* | ***[1]*** |
| | *Comments: The previous setting (commented below) resulted in a very long (~1,000 sec) ACQ/PEAK procedure. I have thus changed settings to simply use the mirror and drop the grism. In 1 sec, the S/N > 150 and the warning on CTE vs. low-background disappeared.*<br><br>*#Previous setting: (ACQ/PEAK with a grism)*<br>*#45s allows to reach over S/N=40 at with STIS/CCD/G750L at 7751 Angstroms. The Spectroscopic ETC yields a warning about the issue with charge transfer #efficiency for low background, but we are just using the CCD for the target acquisition, after which we switch to the MAMA.* | | | | | | | | |
| 3 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900;<br>WAVECAL=NO | | Sequence 1-4 Non-Int in STIS/FUV (01) | 1995 Secs (1995 Secs)<br>*[==>]* | ***[1]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 4 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 1-4 Non-Int in STIS/FUV (01) | *[==>]* | ***[1]*** |
| 5 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900 | | Sequence 5-6 Non-Int in STIS/FUV (01) | 2961 Secs (2961 Secs)<br>*[==>]* | ***[2]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 6 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 5-6 Non-Int in STIS/FUV (01) | *[==>]* | ***[2]*** |
| 7 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900 | | Sequence 7-8 Non-Int in STIS/FUV (01) | 2961 Secs (2961 Secs)<br>*[==>]* | ***[3]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 8 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 7-8 Non-Int in STIS/FUV (01) | *[==>]* | ***[3]*** |
| 9 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900 | | Sequence 9-10 Non-Int in STIS/FUV (01) | 2961 Secs (2961 Secs)<br>*[==>]* | ***[4]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 10 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 9-10 Non-Int in STIS/FUV (01) | *[==>]* | ***[4]*** |
| 11 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900 | | Sequence 11-12 Non-Int in STIS/FUV (01) | 2961 Secs (2961 Secs)<br>*[==>]* | ***[5]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 12 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 11-12 Non-Int in STIS/FUV (01) | *[==>]* | ***[5]*** |

Orbit Structure




Orbit 3
Server Version: 20171009
*** ORBITAL VISIBILITY OVERRUN = 8
GS Reacq
Exp. 7
Occultation
Exp. 8
0
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1000
1500
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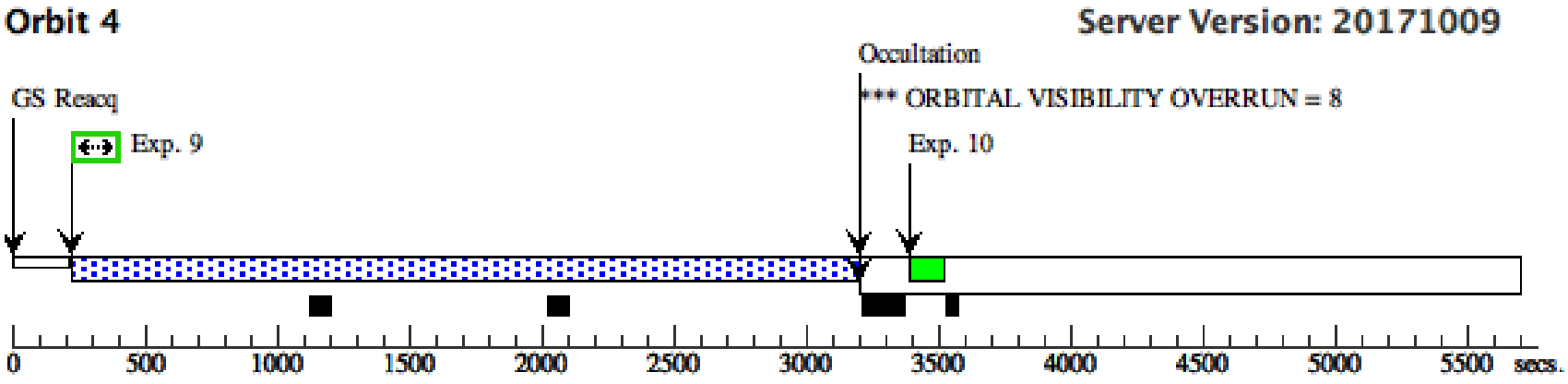
3500
4000
4500
5000
5500
secs.


Orbit 4
Server Version: 20171009
Occultation
*** ORBITAL VISIBILITY OVERRUN = 8
GS Reacq
Exp. 9
Exp. 10
0
500
1000
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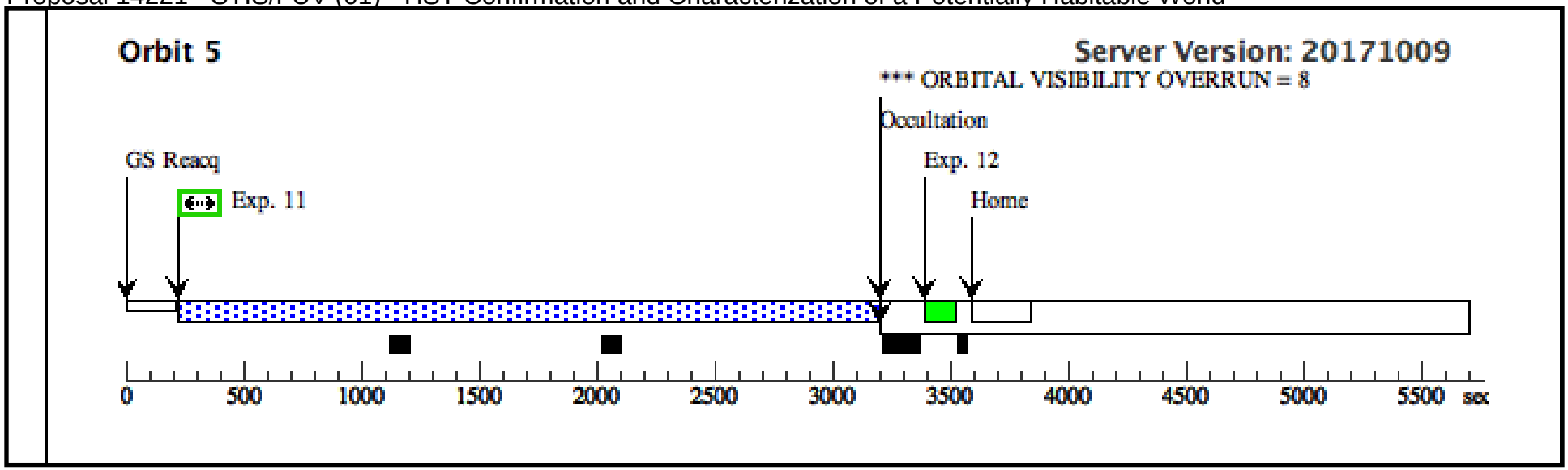
3500
4000
4500
5000
5500
secs.


Orbit 5
Server Version: 20171009
*** ORBITAL VISIBILITY OVERRUN = 8
Occultation
GS Reacq
Exp. 11
Exp. 12
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

## Visit

**Proposal 14221, STIS/FUV (11), failed** Thu Feb 01 22:02:14 GMT 2018

**Diagnostic Status: Warning**

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: SCHED 100%; Period 32.939700 D AND ZERO-PHASE HJD2457264.391819

*Comments: This 5-orbit visit will capture the transit of the planet using STIS/FUV-MAMA.*
*Added as a repeat of visit 01 which did not execute due to a STIS safing on 6/19/2016*

## Diagnostics

(STIS/FUV (11)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(STIS/FUV (11)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

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(Science (11.007)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Science (11.009)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Science (11.011)) Warning (Form): Sensitive exposures should have an ETC run number provided.

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*Comments: This object was generated by the targetselector and retrieved from the 2MASS database. It's also part of the K2 Ecliptic Plan Input Catalog. None of those data bases list proper motions. However, we will be able to retrieve those from contemporaneous observations we are doing from the ground to follow-up the system. We will update the Phase 2 as soon as possible with these information.*
*Category=STAR*
*Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]*
*Extended=NO*

**Exposures**

| # | Label (ETC Run) | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
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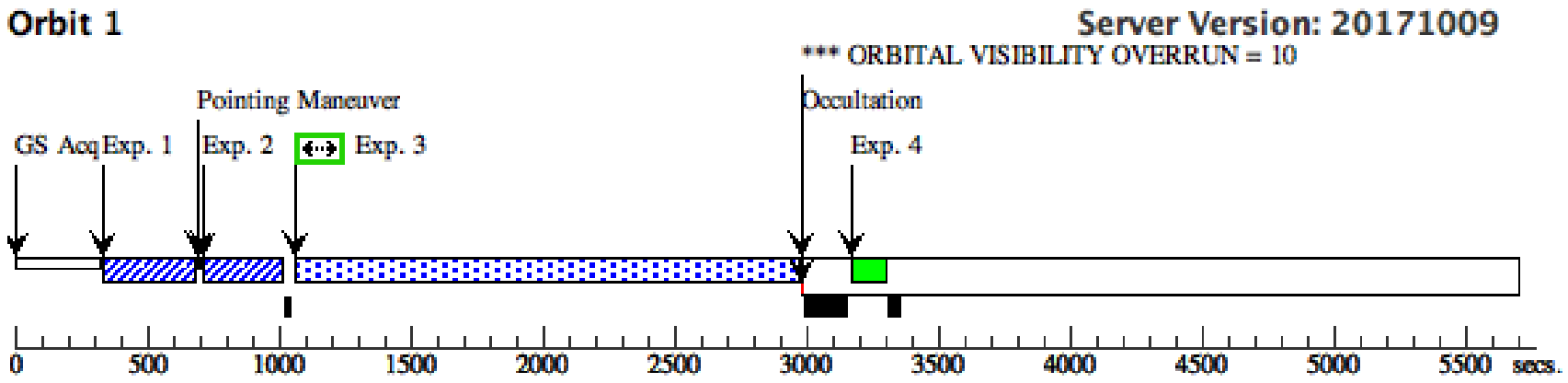
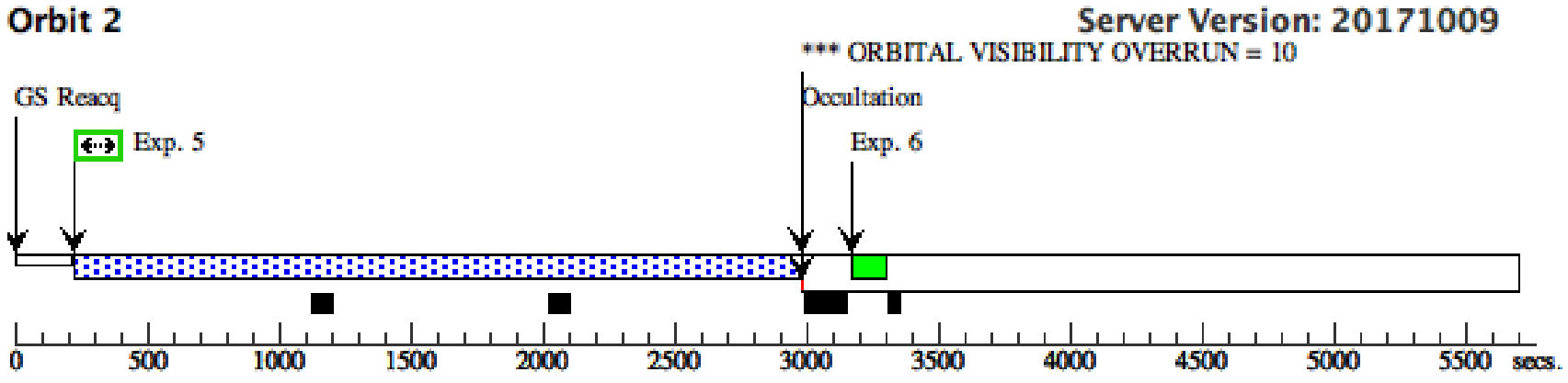
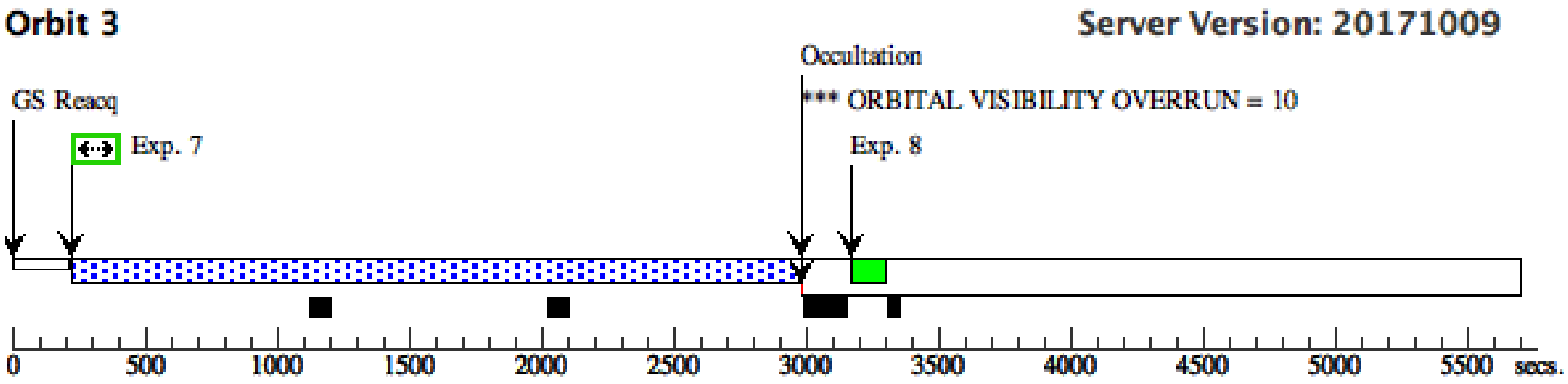
| | *Comments: 14s allows to obtain S/N > 50 for this acquisition exposure.* | | | | | | | | |
| 2 | ACQ/PEAK (STIS.ta.771489) | (1) 2M11301450+0735180 | STIS/CCD, ACQ/PEAK, 52X0.05 | MIRROR | | | Sequence 1-4 Non-Int in STIS/FUV (11) | 1 Secs (1 Secs)<br>*[==>]* | ***[1]*** |
| | *Comments: The previous setting (commented below) resulted in a very long (~1,000 sec) ACQ/PEAK procedure. I have thus changed settings to simply use the mirror and drop the grism. In 1 sec, the S/N > 150 and the warning on CTE vs. low-background disappeared.*<br><br>*#Previous setting: (ACQ/PEAK with a grism)*<br>*#45s allows to reach over S/N=40 at with STIS/CCD/G750L at 7751 Angstroms. The Spectroscopic ETC yields a warning about the issue with charge transfer #efficiency for low background, but we are just using the CCD for the target acquisition, after which we switch to the MAMA.* | | | | | | | | |
| 3 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900;<br>WAVECAL=NO | | Sequence 1-4 Non-Int in STIS/FUV (11) | 1774 Secs (1774 Secs)<br>*[==>]* | ***[1]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 4 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 1-4 Non-Int in STIS/FUV (11) | *[==>]* | ***[1]*** |
| 5 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900 | | Sequence 5-6 Non-Int in STIS/FUV (11) | 2740 Secs (2740 Secs)<br>*[==>]* | ***[2]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 6 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 5-6 Non-Int in STIS/FUV (11) | *[==>]* | ***[2]*** |
| 7 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900 | | Sequence 7-8 Non-Int in STIS/FUV (11) | 2740 Secs (2740 Secs)<br>*[==>]* | ***[3]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 8 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 7-8 Non-Int in STIS/FUV (11) | *[==>]* | ***[3]*** |
| 9 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900 | | Sequence 9-10 Non-Int in STIS/FUV (11) | 2740 Secs (2740 Secs)<br>*[==>]* | ***[4]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 10 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 9-10 Non-Int in STIS/FUV (11) | *[==>]* | ***[4]*** |
| 11 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900 | | Sequence 11-12 Non-Int in STIS/FUV (11) | 2740 Secs (2740 Secs)<br>*[==>]* | ***[5]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 12 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 11-12 Non-Int in STIS/FUV (11) | *[==>]* | ***[5]*** |

Orbit Structure




Orbit 3
Server Version: 20171009
Occultation
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Exp. 8
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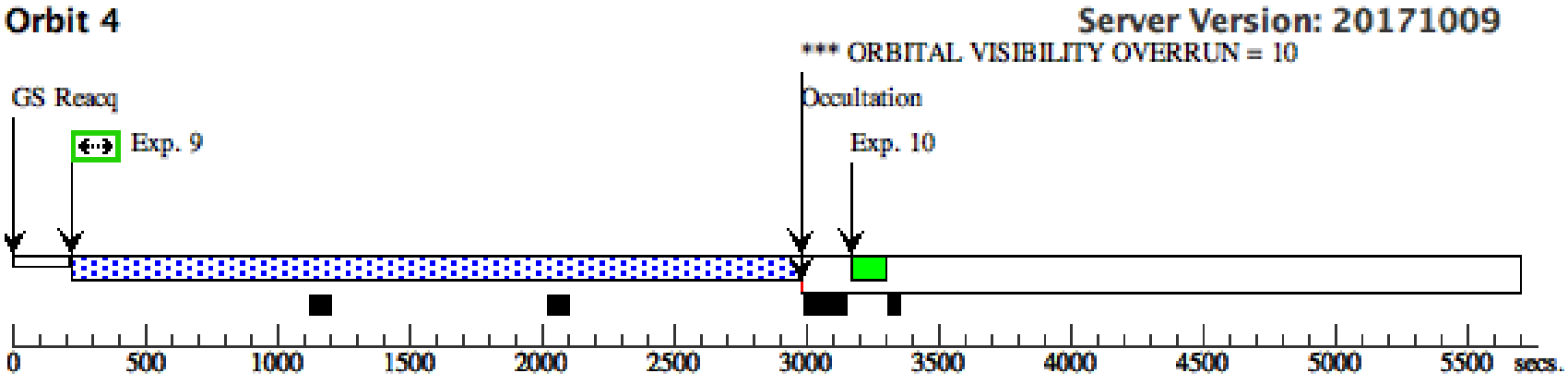
4500
5000
5500
secs.


Orbit 4
Server Version: 20171009
*** ORBITAL VISIBILITY OVERRUN = 10
Occultation
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Exp. 9
Exp. 10
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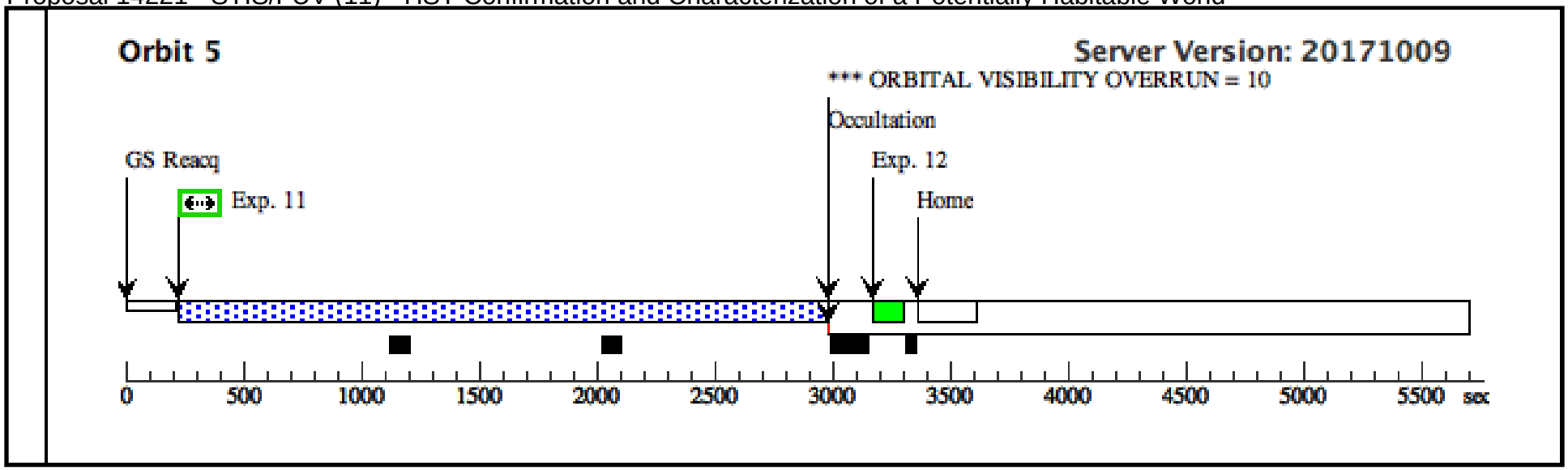
4500
5000
5500
secs.


Orbit 5
Server Version: 20171009
*** ORBITAL VISIBILITY OVERRUN = 10
Occultation
GS Reacq
Exp. 12
Exp. 11
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

## Visit

**Proposal 14221, STIS/FUV (21), implementation** Thu Feb 01 22:02:14 GMT 2018

**Diagnostic Status: Warning**

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: SCHED 100%; Period 32.939700 D AND ZERO-PHASE HJD2457264.391819

*Comments: This 4-orbit visit will capture the transit of the planet using STIS/FUV-MAMA.*
*Added as a repeat of visit 11 which was lost due to a MAMA1 reset event (HOPR 88203).*
*The repeat is 4 orbits instead of the original 5 to optimize schedulability.*

## Diagnostics

(STIS/FUV (21)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

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(Science (21.003)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Science (21.005)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Science (21.007)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Science (21.009)) Warning (Form): Sensitive exposures should have an ETC run number provided.

## Fixed Targets

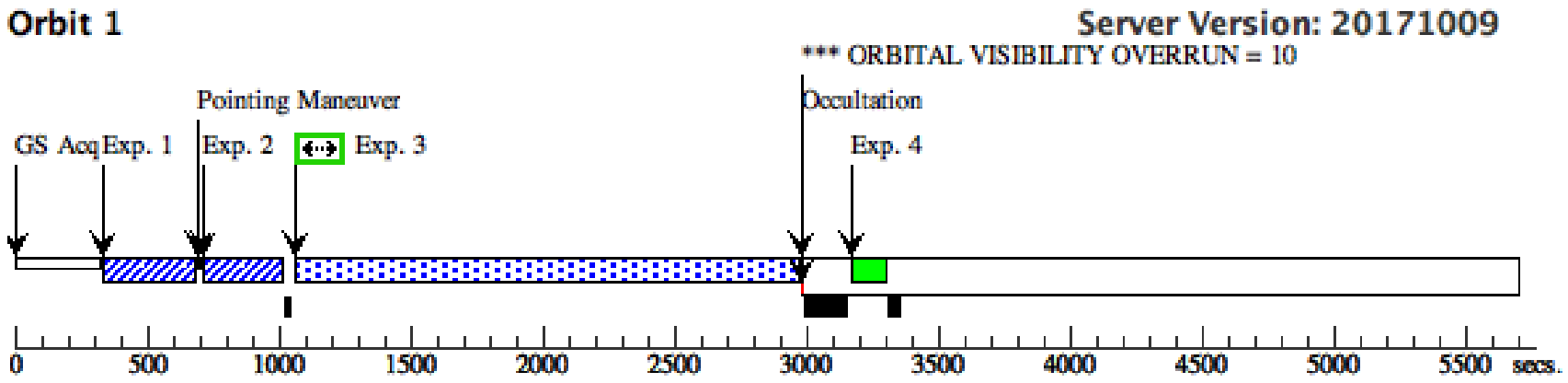
| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | 2M11301450+0735180<br>Alt Name1: EPIC201912552<br>Alt Name2: 2MASS11301450+0735180 | RA: 11 30 14.5092 (172.5604550d)<br>Dec: +07 35 18.05 (7.58835d)<br>Equinox: J2000 | Proper Motion RA: -74 mas/yr<br>Proper Motion Dec: -122 mas/yr<br>Epoch of Position: 2000 | V=13.5+/-0.05<br>J=9.76,<br>H=9.13,<br>K=8.90 | Reference Frame: ICRS |

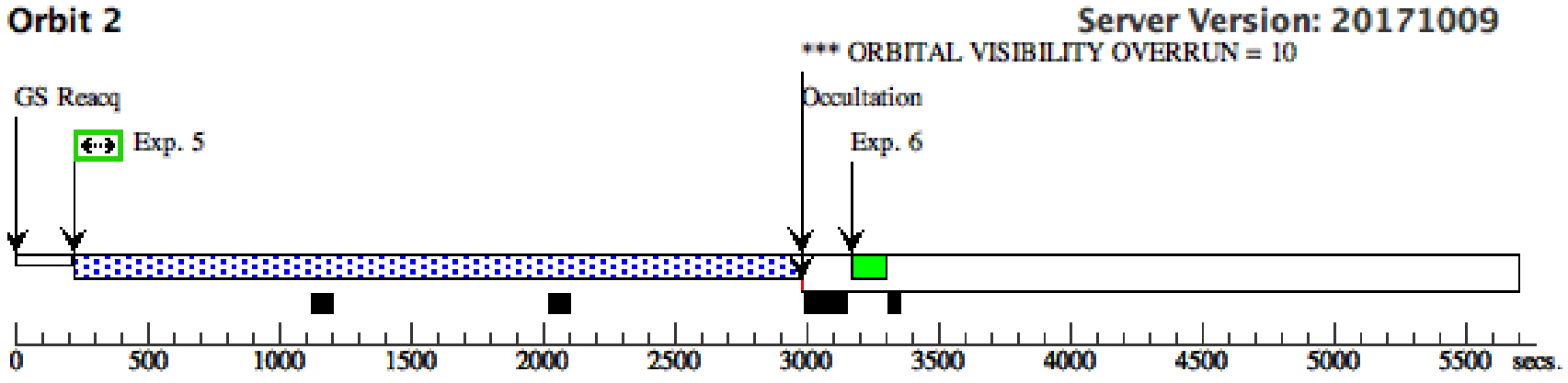
*Comments: This object was generated by the targetselector and retrieved from the 2MASS database. It's also part of the K2 Ecliptic Plan Input Catalog. None of those data bases list proper motions. However, we will be able to retrieve those from contemporaneous observations we are doing from the ground to follow-up the system. We will update the Phase 2 as soon as possible with these information.*
*Category=STAR*
*Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]*
*Extended=NO*

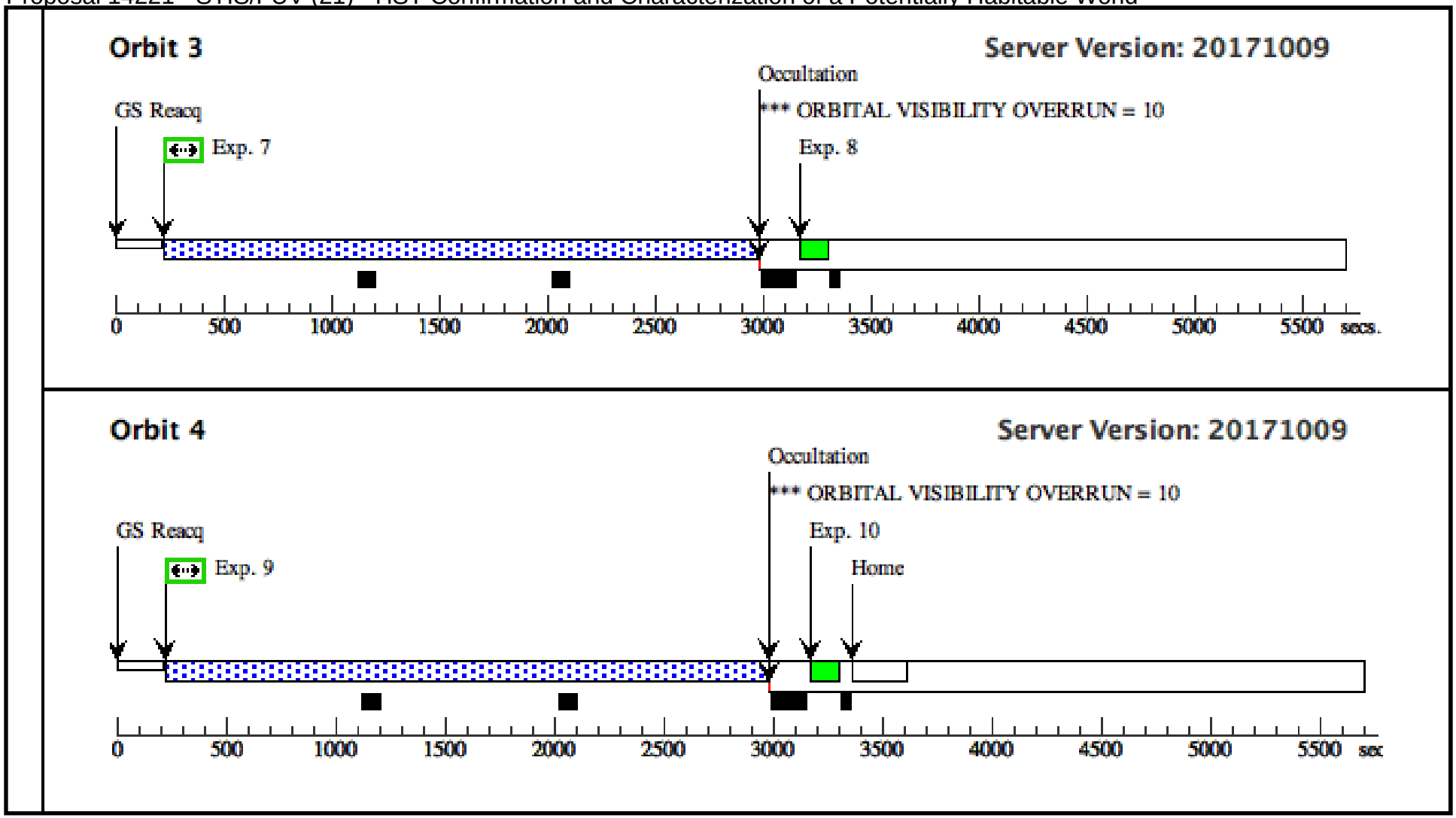
**Exposures**

| # | Label (ETC Run) | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ACQ (STIS.ta.733994) | (1) 2M11301450+0735180 | STIS/CCD, ACQ, F25ND3 | MIRROR | | PHASE 0.99508 TO 0.99598 | Sequence 1-4 Non-Int in STIS/FUV (21) | 14 Secs (14 Secs)<br>*[==>]* | ***[1]*** |
| | *Comments: 14s allows to obtain S/N > 50 for this acquisition exposure.* | | | | | | | | |
| 2 | ACQ/PEAK (STIS.ta.771489) | (1) 2M11301450+0735180 | STIS/CCD, ACQ/PEAK, 52X0.05 | MIRROR | | | Sequence 1-4 Non-Int in STIS/FUV (21) | 1 Secs (1 Secs)<br>*[==>]* | ***[1]*** |
| | *Comments: The previous setting (commented below) resulted in a very long (~1,000 sec) ACQ/PEAK procedure. I have thus changed settings to simply use the mirror and drop the grism. In 1 sec, the S/N > 150 and the warning on CTE vs. low-background disappeared.*<br><br>*#Previous setting: (ACQ/PEAK with a grism)*<br>*#45s allows to reach over S/N=40 at with STIS/CCD/G750L at 7751 Angstroms. The Spectroscopic ETC yields a warning about the issue with charge transfer #efficiency for low background, but we are just using the CCD for the target acquisition, after which we switch to the MAMA.* | | | | | | | | |
| 3 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900;<br>WAVECAL=NO | | Sequence 1-4 Non-Int in STIS/FUV (21) | 1774 Secs (1774 Secs)<br>*[==>]* | ***[1]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 4 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 1-4 Non-Int in STIS/FUV (21) | *[==>]* | ***[1]*** |
| 5 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900 | | Sequence 5-6 Non-Int in STIS/FUV (21) | 2740 Secs (2740 Secs)<br>*[==>]* | ***[2]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 6 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 5-6 Non-Int in STIS/FUV (21) | *[==>]* | ***[2]*** |
| 7 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900 | | Sequence 7-8 Non-Int in STIS/FUV (21) | 2740 Secs (2740 Secs)<br>*[==>]* | ***[3]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 8 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 7-8 Non-Int in STIS/FUV (21) | *[==>]* | ***[3]*** |
| 9 | Science | (1) 2M11301450+0735180 | STIS/FUV-MAMA, TIME-TAG, 52X0.05 | G140M 1222 A | BUFFER-TIME=900 | | Sequence 9-10 Non-Int in STIS/FUV (21) | 2740 Secs (2740 Secs)<br>*[==>]* | ***[4]*** |
| | *Comments: The star is of the same spectral type (M2V) as GJ 436, observed several time (e.g., GO#12965) in this configuration. The target is ~3 mag fainter and farther away (30 pc vs. 10 pc) than GJ 436, so the Lyman-alpha flux of the target will be weaker than GJ 436's.* | | | | | | | | |
| 10 | GO-WAVE CAL | WAVE | STIS/FUV-MAMA, ACCUM, 52X0.05 | G140M 1222 A | | | Sequence 9-10 Non-Int in STIS/FUV (21) | *[==>]* | ***[4]*** |

Orbit Structure




Orbit 3
Server Version: 20171009
Occultation
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GS Reacq
Exp. 7
Exp. 8
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.
Orbit 4
Server Version: 20171009
Occultation
*** ORBITAL VISIBILITY OVERRUN = 10
GS Reacq
Exp. 9
Exp. 10
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec