



13042 - Confirming the theoretical link between ultra-massive white dwarfs and heavy-weight intermediate mass stars.

Cycle: 20, 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) NGC6705-POINTING1 | WFC3/UVIS | 3 | 03-Jul-2012 23:24:29.0 | yes |
| 02 | (2) NGC6705-POINTING2 | WFC3/UVIS | 3 | 03-Jul-2012 23:24:51.0 | yes |
| 03 | (3) NGC6705-POINTING3 | WFC3/UVIS | 3 | 03-Jul-2012 23:25:10.0 | yes |

9 Total Orbits Used

ABSTRACT

We propose to probe the theoretically predicted evolutionary link between ultra-massive O+Ne white dwarfs and stars with $M_{\text{init}} \sim 5\text{-}10 M_{\text{solar}}$ by using HST and WFC3 to obtain good S/N (~ 30) imaging to ~ 25 mag. of 22 sq. arcmins of the young open cluster NGC6705. These observations will allow us to address gaping deficiencies in the current understanding of the late-stage evolution of heavy-weight intermediate mass stars and significantly advance the poor present level of knowledge about their role in the chemical evolution of the Galaxy and other galaxies.

OBSERVING DESCRIPTION

These observations will provide deep imaging of the extremely rich young/intermediate age open cluster NGC6705 in the F336W and F555W bands at three discrete WFC3 field pointings. The main goal of this experiment is to identify and characterise faint white dwarf cluster members from their location in the F336W, F555W color-magnitude diagram.

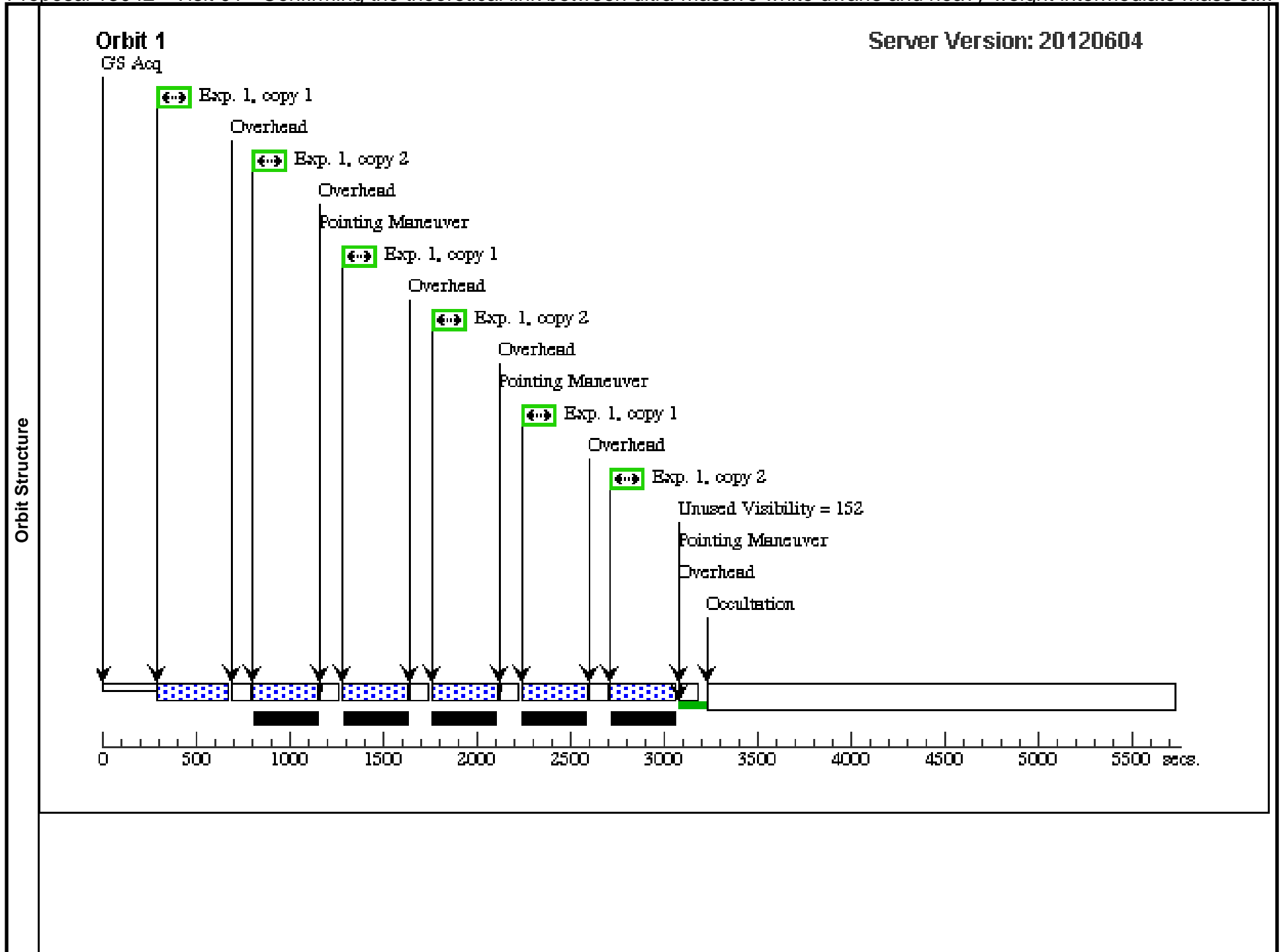
NGC6705 is a strongly centrally concentrated open cluster which contains numerous extremely bright sources ($V < 12$). To maximise the number of white dwarfs we detect, which is important for achieving our science goals, we need to point as close to the cluster center as possible but at the same time keep to a minimum the area of CCD that is affected by saturated pixels and overflows. Therefore, we have placed constraints on the ORIENTATION of each pointing so as to ensure that the bulk of these brightest stars do not fall within our fields of view. Additionally, we have kept the proposed integration times in the F555W band, where saturation is worst, as short (350s) as still allows for parallel buffer dumps.

To sub-sample the WFC3 PSF and to aid in cosmic ray and bad pixel rejection, we employ the default WFC3-UVIS BOX and LINE-3PT dither patterns.

Proposal 13042 - Visit 01 - Confirming the theoretical link between ultra-massive white dwarfs and heavy-weight intermediate mass st...

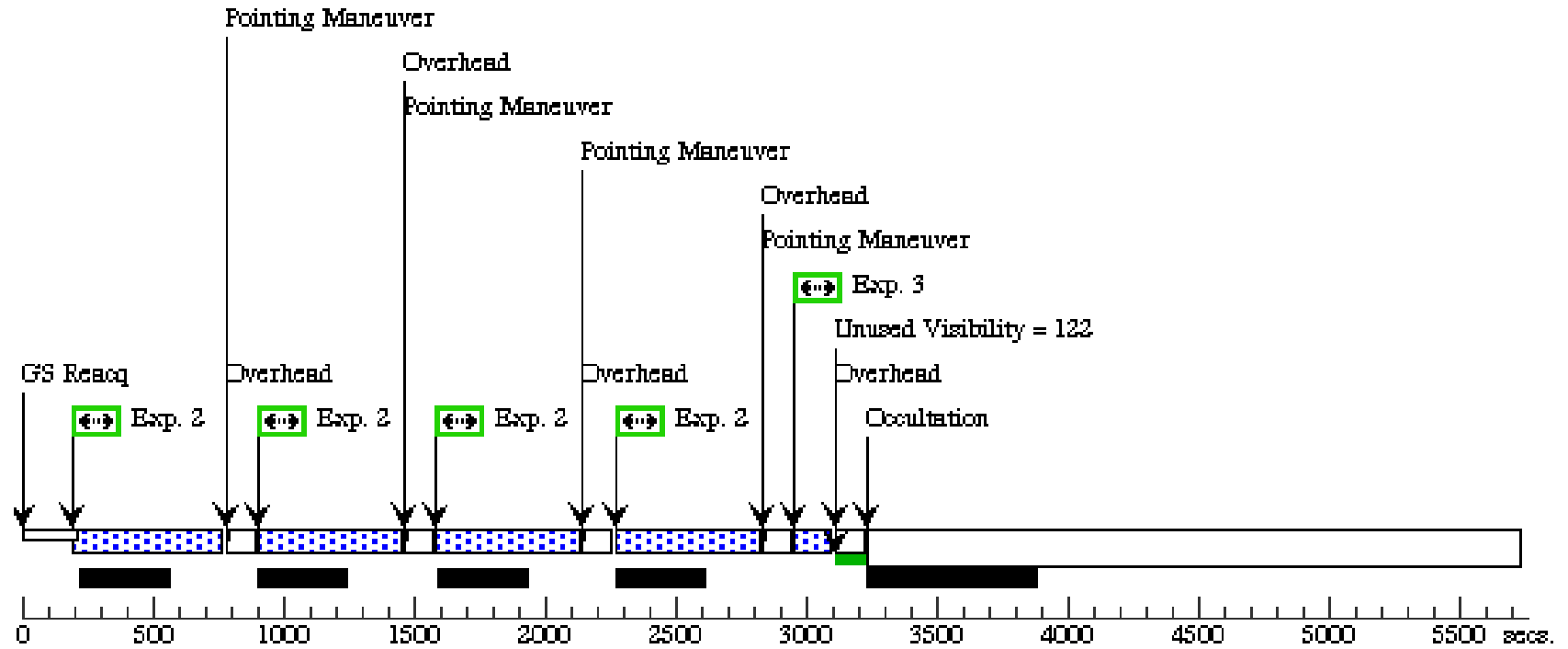
Wed Jul 04 03:25:21 GMT 2012

| Visit | Proposal 13042, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 91D TO 92 D | | | | | | | | | |
|--|--|--|---|-------------------------------|------------------|-----------------------|---------------|-------------------------------------|--|-------|
| | # | Primary Pattern | Secondary Pattern | Exposures | | | | | | |
| Patterns | (4) | 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 | (2), (4) | | | | | | |
| | (5) | Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false | (1) | | | | | | |
| Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | | |
| | (1) | NGC6705-POINTING1 | RA: 18 50 51.6832 (282.7153467d) Dec: -06 14 24.49 (-6.24014d) Equinox: J2000 | | V=25.2 U~24.4 | Reference Frame: ICRS | | | | |
| <i>Comments: The V (and U) magnitude corresponds to the faintest objects we aim to detect in this field.</i> | | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
| | 1 | | (1) NGC6705-POINTING1 | WFC3/UVIS, ACCUM, UVIS-CENTER | F555W | | | Pattern 5, Exps 1-1 in Visit 01 (5) | 350 Secs X 2 [=>(Pattern 1, Copy 1)] [=>(Pattern 1, Copy 2)] [=>(Pattern 2, Copy 1)] [=>(Pattern 2, Copy 2)] [=>(Pattern 3, Copy 1)] [=>(Pattern 3, Copy 2)] | [1] |
| | 2 | | (1) NGC6705-POINTING1 | WFC3/UVIS, ACCUM, UVIS-CENTER | F336W | FLASH=10.0 | | Pattern 4, Exps 2-2 in Visit 01 (4) | 550 Secs [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)] | [2] |
| | 3 | | (1) NGC6705-POINTING1 | WFC3/UVIS, ACCUM, UVIS-CENTER | F555W | FLASH=7 | | | 120 Secs [=>] | [2] |
| | 4 | | (1) NGC6705-POINTING1 | WFC3/UVIS, ACCUM, UVIS-CENTER | F336W | FLASH=10.0 | | Pattern 4, Exps 4-4 in Visit 01 (4) | 550 Secs [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)] | [3] |
| 5 | | (1) NGC6705-POINTING1 | WFC3/UVIS, ACCUM, UVIS-CENTER | F555W | FLASH=7 | | | 120 Secs [=>] | [3] | |



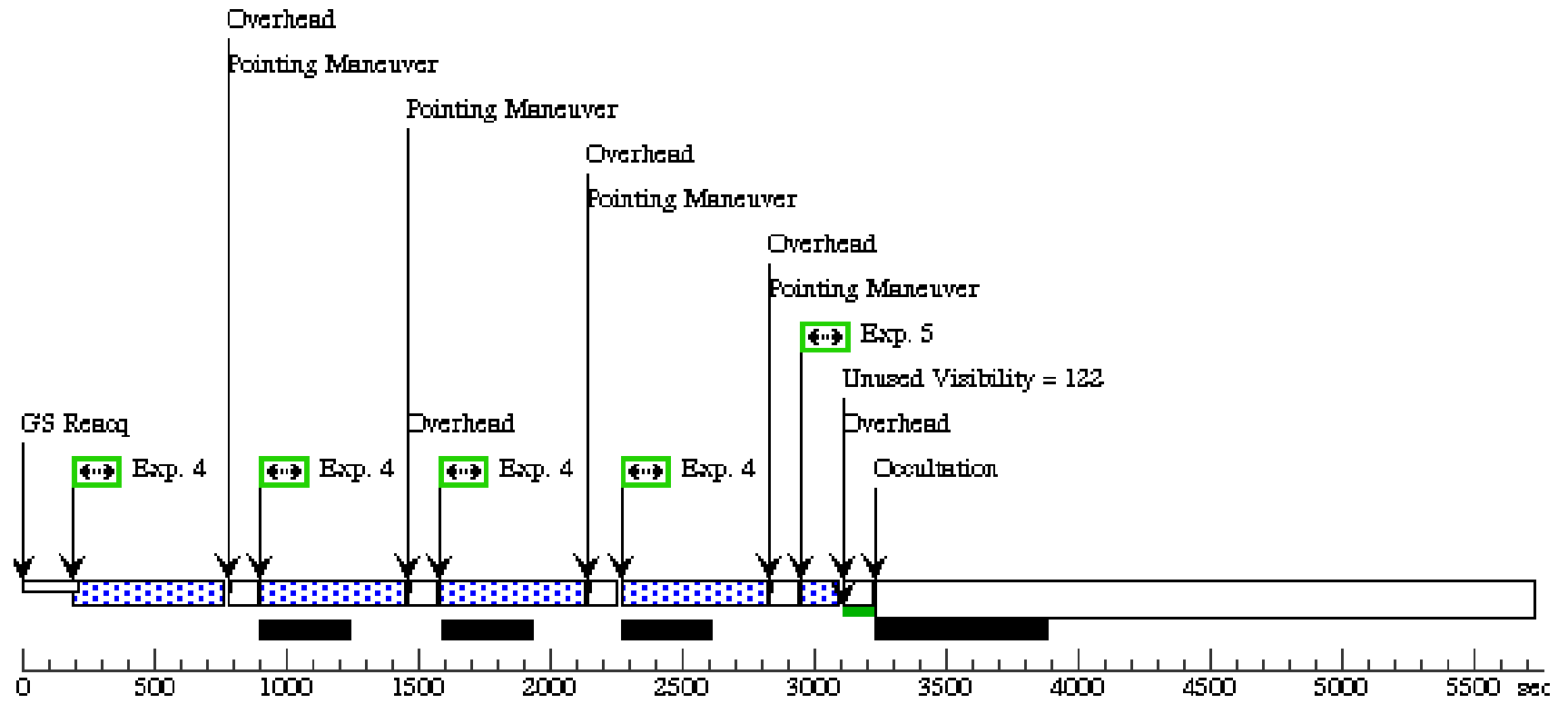
Orbit 2

Server Version: 20120604



Orbit 3

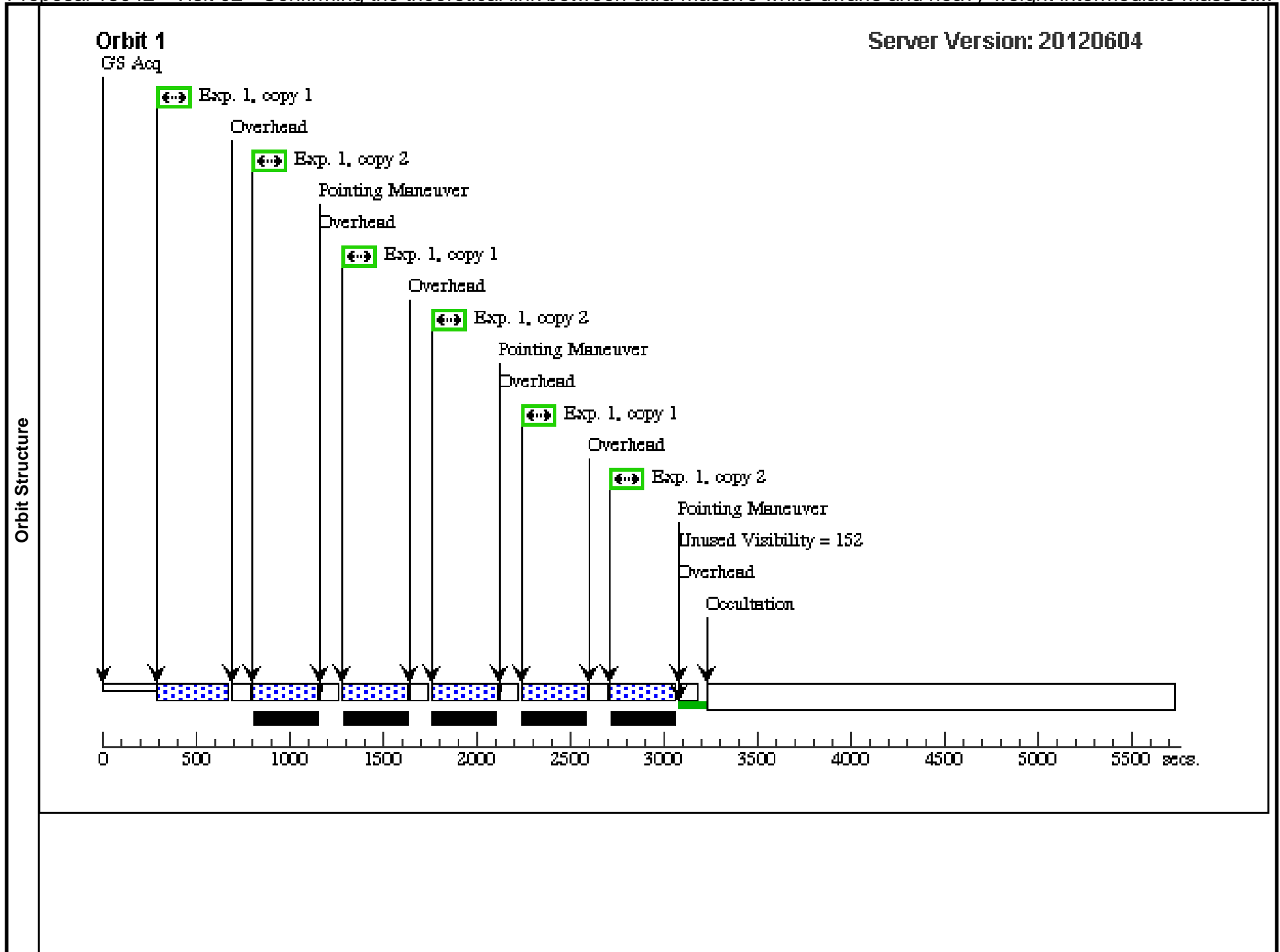
Server Version: 20120604



Proposal 13042 - Visit 02 - Confirming the theoretical link between ultra-massive white dwarfs and heavy-weight intermediate mass st...

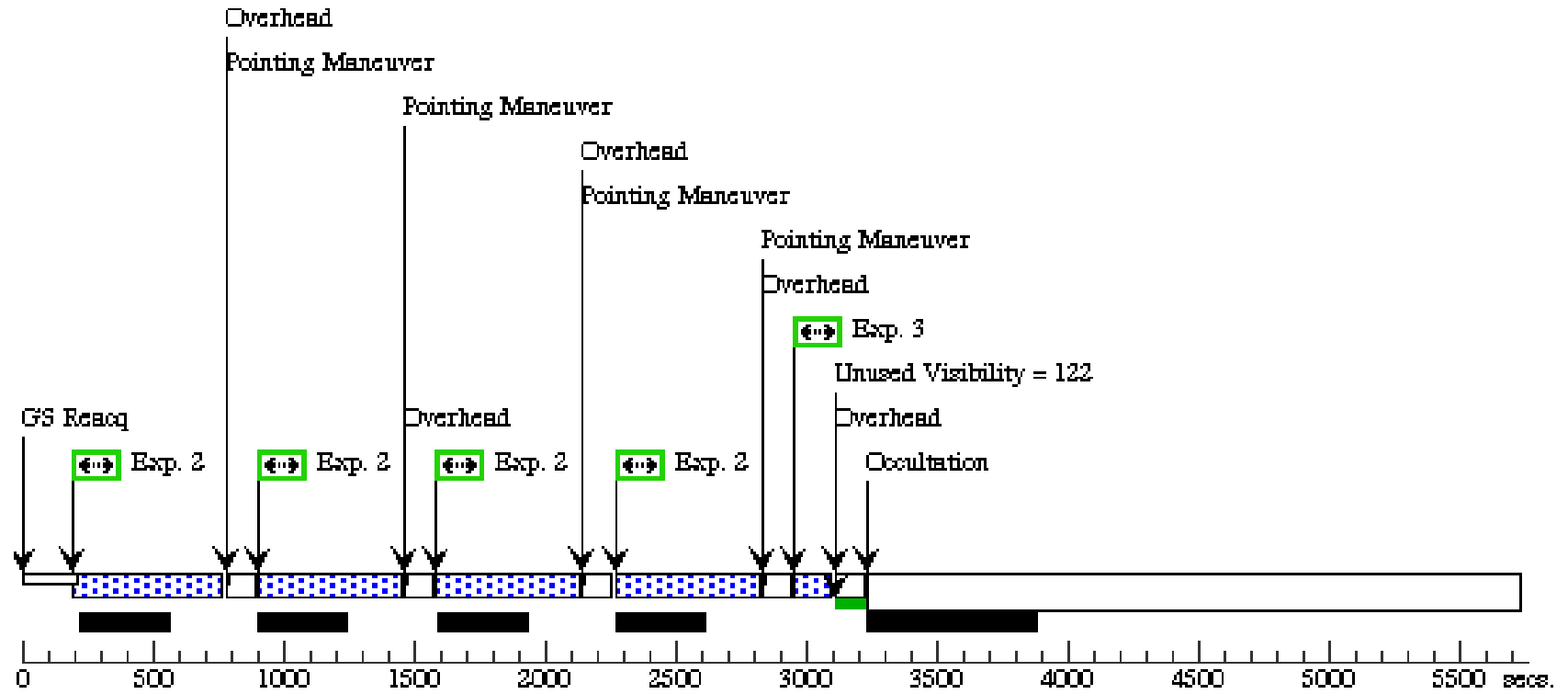
Wed Jul 04 03:25:27 GMT 2012

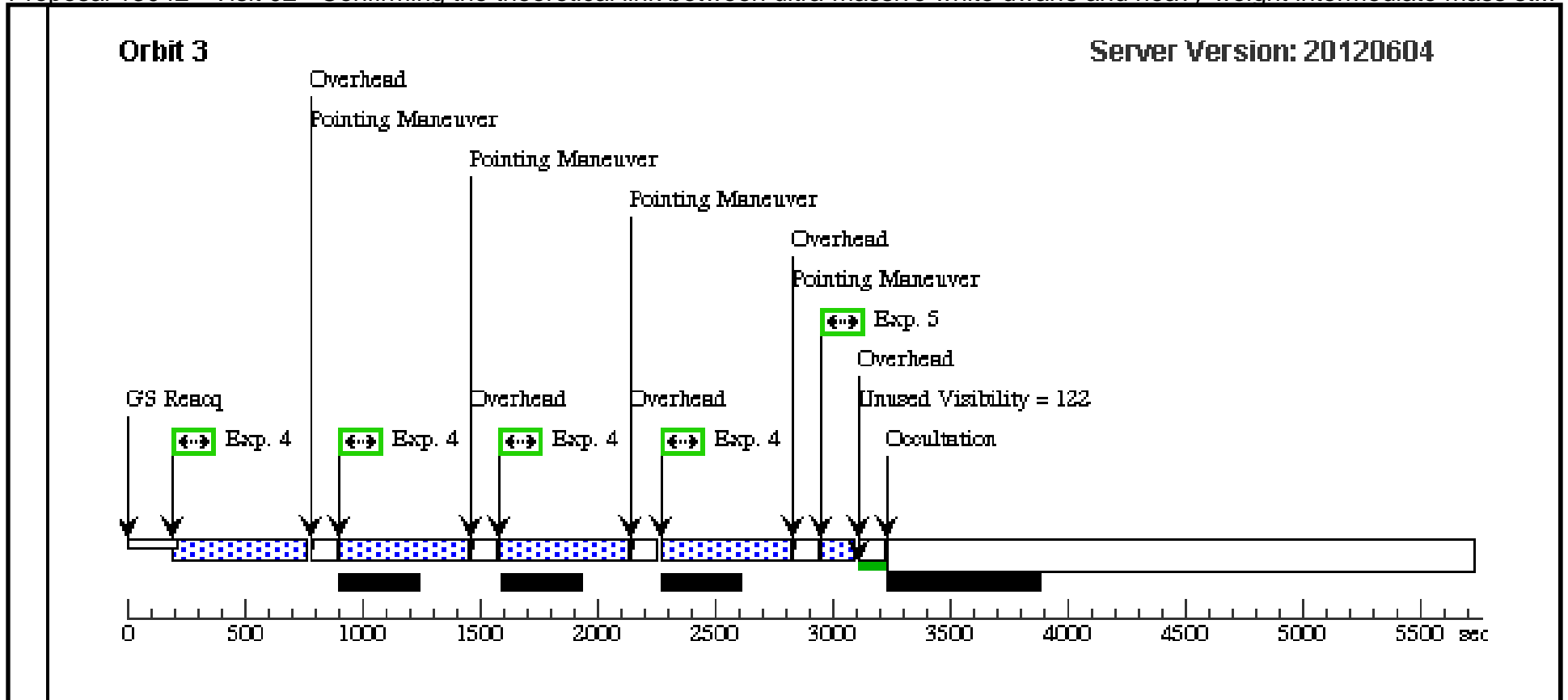
| Visit | Proposal 13042, Visit 02 | | | | | | | | | |
|---------------|--|--|---|-------------------------------|------------------|-----------------------|---------------|-------------------------------------|--|-------|
| | | Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 115D TO 120 D | | | | | | | | |
| Patterns | # | Primary Pattern | | Secondary Pattern | Exposures | | | | | |
| | (4) | 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 | | (2), (4) | | | | | |
| | (5) | Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false | | (1) | | | | | |
| Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | | |
| | (2) | NGC6705-POINTING2 | RA: 18 51 2.9359 (282.7622329d) Dec: -06 19 17.23 (-6.32145d) Equinox: J2000 | | V=25.2 U~24.4 | Reference Frame: ICRS | | | | |
| | <i>Comments: The V (and U) magnitude corresponds to the faintest objects we aim to detect in this field.</i> | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
| | 1 | | (2) NGC6705-POINTING2 | WFC3/UVIS, ACCUM, UVIS-CENTER | F555W | | | Pattern 5, Exps 1-1 in Visit 02 (5) | 350 Secs X 2 [=>(Pattern 1, Copy 1)] [=>(Pattern 1, Copy 2)] [=>(Pattern 2, Copy 1)] [=>(Pattern 2, Copy 2)] [=>(Pattern 3, Copy 1)] [=>(Pattern 3, Copy 2)] | [1] |
| | 2 | | (2) NGC6705-POINTING2 | WFC3/UVIS, ACCUM, UVIS-CENTER | F336W | FLASH=10.0 | | Pattern 4, Exps 2-2 in Visit 02 (4) | 550 Secs [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)] | [2] |
| | 3 | | (2) NGC6705-POINTING2 | WFC3/UVIS, ACCUM, UVIS-CENTER | F555W | FLASH=7 | | | 120 Secs [=>] | [2] |
| | 4 | | (2) NGC6705-POINTING2 | WFC3/UVIS, ACCUM, UVIS-CENTER | F336W | FLASH=10 | | Pattern 4, Exps 4-4 in Visit 02 (4) | 550 Secs [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)] | [3] |
| | 5 | | (2) NGC6705-POINTING2 | WFC3/UVIS, ACCUM, UVIS-CENTER | F555W | FLASH=7 | | | 120 Secs [=>] | [3] |



Orbit 2

Server Version: 20120604

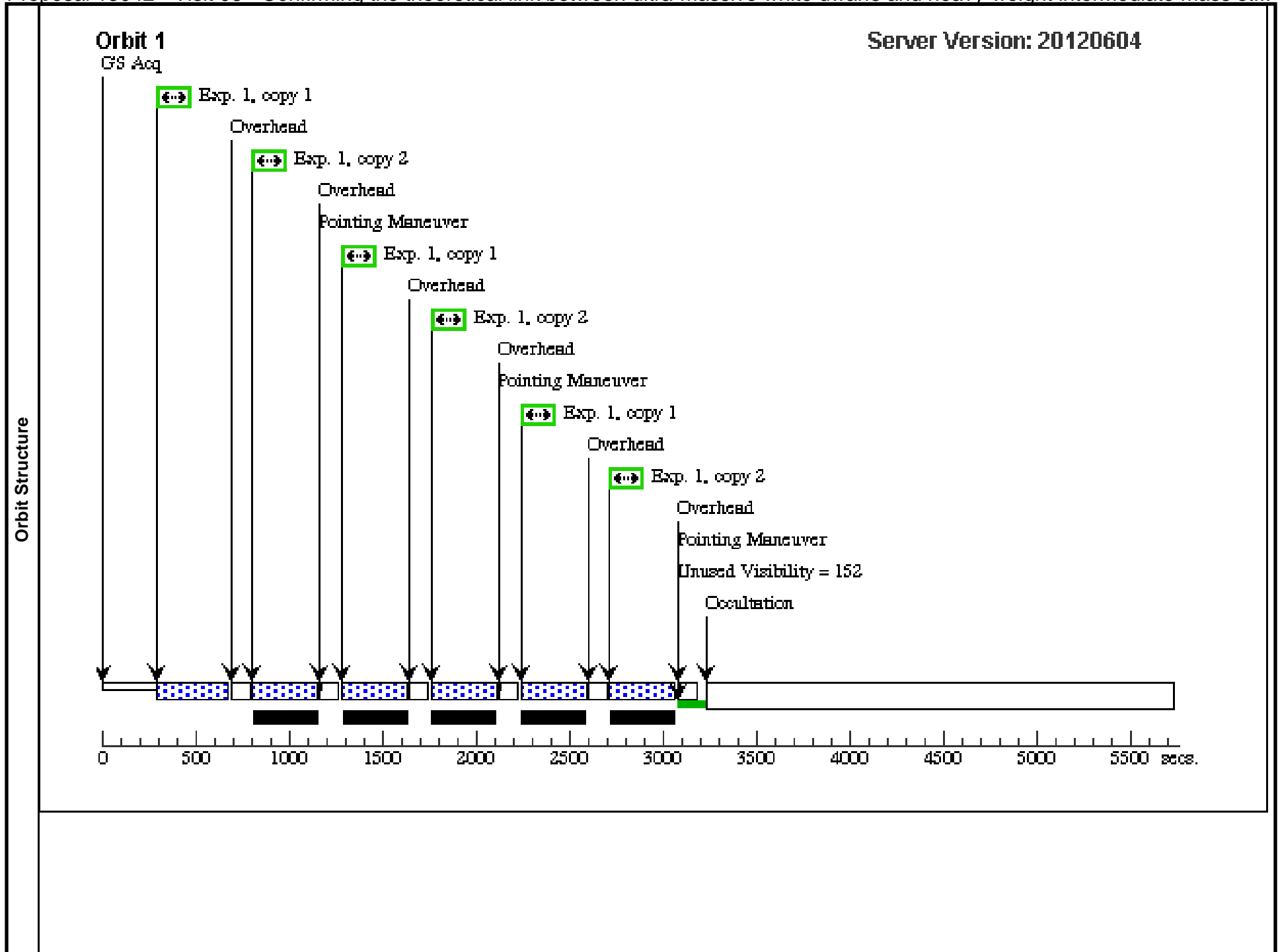




Proposal 13042 - Visit 03 - Confirming the theoretical link between ultra-massive white dwarfs and heavy-weight intermediate mass st...

Wed Jul 04 03:25:30 GMT 2012

| Visit | Proposal 13042, Visit 03 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 90.0D TO 90.0 D | | | | | | | | | |
|--|--|--|---|-------------------------------|------------------|-----------------------|---------------|-------------------------------------|--|-------|
| | # | Primary Pattern | Secondary Pattern | Exposures | | | | | | |
| Patterns | (4) | 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 | (2), (4) | | | | | | |
| | (5) | Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false | (1) | | | | | | |
| Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | | |
| | (3) | NGC6705-POINTING3 | RA: 18 51 11.4637 (282.7977654d) Dec: -06 13 37.24 (-6.22701d) Equinox: J2000 | | V=25.2 U~24.4 | Reference Frame: ICRS | | | | |
| <i>Comments: The V (and U) magnitude corresponds to the faintest objects we aim to detect in this field.</i> | | | | | | | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
| | 1 | | (3) NGC6705-POINTING3 | WFC3/UVIS, ACCUM, UVIS-CENTER | F555W | | | Pattern 5, Exps 1-1 in Visit 03 (5) | 350 Secs X 2 [==>(Pattern 1, Copy 1)] [==>(Pattern 1, Copy 2)] [==>(Pattern 2, Copy 1)] [==>(Pattern 2, Copy 2)] [==>(Pattern 3, Copy 1)] [==>(Pattern 3, Copy 2)] | [1] |
| | 2 | | (3) NGC6705-POINTING3 | WFC3/UVIS, ACCUM, UVIS-CENTER | F336W | FLASH=10 | | Pattern 4, Exps 2-2 in Visit 03 (4) | 550 Secs [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)] | [2] |
| | 3 | | (3) NGC6705-POINTING3 | WFC3/UVIS, ACCUM, UVIS-CENTER | F555W | FLASH=7 | | | 120 Secs [==>] | [2] |
| | 4 | | (3) NGC6705-POINTING3 | WFC3/UVIS, ACCUM, UVIS-CENTER | F336W | FLASH=10 | | Pattern 4, Exps 4-4 in Visit 03 (4) | 550 Secs [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)] | [3] |
| 5 | | (3) NGC6705-POINTING3 | WFC3/UVIS, ACCUM, UVIS-CENTER | F555W | FLASH=7 | | | 120 Secs [==>] | [3] | |



Orbit 2

Server Version: 20120604

