# 10516 - Host Galaxies of Reverberation-Mapped AGNs

Cycle: 14, Proposal Category: GO

(Availability Mode: SUPPORTED)

**INVESTIGATORS**



| *Name* | *Institution* | *E-Mail* |
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**VISITS**

| *Visit* | *Targets* | *Configurations* | *Orbits Used* | *Last Orbit Planner Run* | *OP Current with Visit?* |
|---|---|---|---|---|---|
| 01 | (1) NGC-3516 | ACS/HRC | 1 | 20-Jun-2005 12:13:12.0 | yes |
| 02 | (2) NGC-4593 | ACS/HRC | 1 | 20-Jun-2005 12:13:17.0 | yes |
| 03 | (3) NGC-7469 | ACS/HRC | 1 | 20-Jun-2005 12:13:20.0 | yes |
| 04 | (4) IC-4329A | ACS/HRC | 1 | 20-Jun-2005 12:13:23.0 | yes |

4 Total Orbits Used

**ABSTRACT**

We propose to obtain unsaturated ACS high-resolution images of four reverberation-mapped active galactic nuclei in order to remove the point-like nuclear light from each image, thus yielding a "nucleus-free" image of the host galaxy. This will allow investigation of host galaxy properties: our

particular interest is determination of the host-galaxy starlight contribution to the reverberation-mapping observations. This is necessary (1) for accurate determination of the relationship between the AGN nuclear continuum flux and the size of the broad Balmer-line emitting regions of AGNs, which is important because this relationship is used in estimating black hole masses for large samples of QSOs, and (2) for accurate determination of the bolometric luminosity of the AGN proper. In a Cycle 12 SNAP program, we obtained images of 14 of the 36 reverberation-mapped AGNs for this purpose. This additional request is to complete this program through observations of the four important remaining sources.

**OBSERVING DESCRIPTION**

Each observation will consist of three exposures of 120 sec, 300 sec, and 600 sec. Multiple exposures are required to both (a) avoid saturation of the bright nucleus and (b) detect the background galaxy so that the point-spread function can be separated accurately. Each target will require less than an HST orbit to observe. All of the targets have bright central point sources and do not require special acquisition methods. The ACS HRC will be used because good sampling of the point-spread function is essential for the proposed science. However, we do not need to use dithering or drizzling to super-sample the PSF. In our SNAP program, we achieved excellent PSF subtractions. We are not trying to detect faint emission or continuum around a very bright point source, like would be done, for example, in quasar host-galaxy searches: the host galaxy is quite visible for these nearby targets. We only need sampling sufficient to perform 2D fits using the GALFIT method described by Peng et al. (2002). Our problem is not so much sampling as avoiding saturation in the central pixels. The observations will be made through the F550M (narrow V-band) filter. This filter is ideal for most of our targets, and will have only a few percent contamination of the stellar images by emission lines. Using a broader bandpass would lead to significant contamination problems. We have sufficient ground-based spectroscopy to accurately model this effect in post processing. The short exposure time is set by using the ACS ETC for point sources in the ACS F550M filter bandpass using scaled AGN spectral templates acquired from the ground. None of the images in our SNAP program were saturated, so this strategy has proven to be successful. The combination of 300s and 600s balances the effects of blooming and other saturation artifacts in the central pixels of the PSF. Extensive experience with archival WFPC2 data of Seyferts in which the nucleus is badly saturated has demonstrated that we can mitigate the effects of heavy saturation in the worst cases with this simple exposure ramp strategy. We used this technique to great effect with WFPC2 data (Pogge et al. 2000).

## Visit

**Proposal 10516, Visit 01** Mon Jun 20 16:13:24 GMT 2005

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/HRC

Special Requirements: (none)

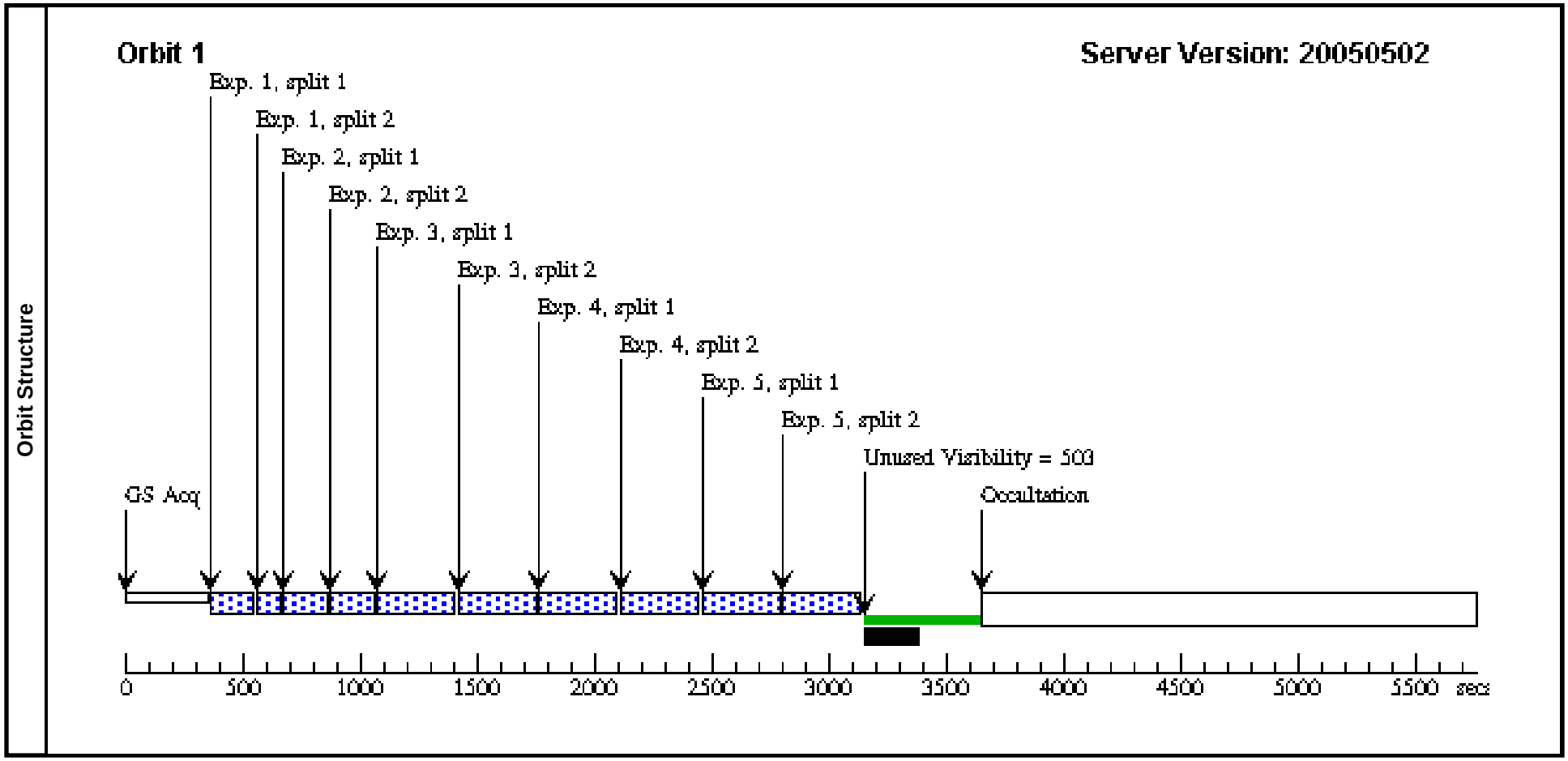
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | NGC-3516 | RA: 11 06 47.5000 (166.6979167d)<br>Dec: +72 34 7.00 (72.56861d)<br>Equinox: J2000<br>Plate Id: (?) | Redshift: 0.00884 | V=12.5 | Coordinate Source: NED |

*Comments: This object was generated by the targetselector and retrieved from the NED database.*

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (1) NGC-3516 | ACS/HRC, ACCUM, HRC | F550M | | | | 120.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 2 | | (1) NGC-3516 | ACS/HRC, ACCUM, HRC | F550M | | | | 300.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 3 | | (1) NGC-3516 | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 4 | | (1) NGC-3516 | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 5 | | (1) NGC-3516 | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |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Exp. 1, split 2
Exp. 2, split 1
Exp. 2, split 2
Exp. 3, split 1
Exp. 3, split 2
Exp. 4, split 1
Exp. 4, split 2
Exp. 5, split 1
Exp. 5, split 2
Unused Visibility = 503
GS Acq
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

## Visit

**Proposal 10516, Visit 02** Mon Jun 20 16:13:26 GMT 2005

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/HRC

Special Requirements: (none)

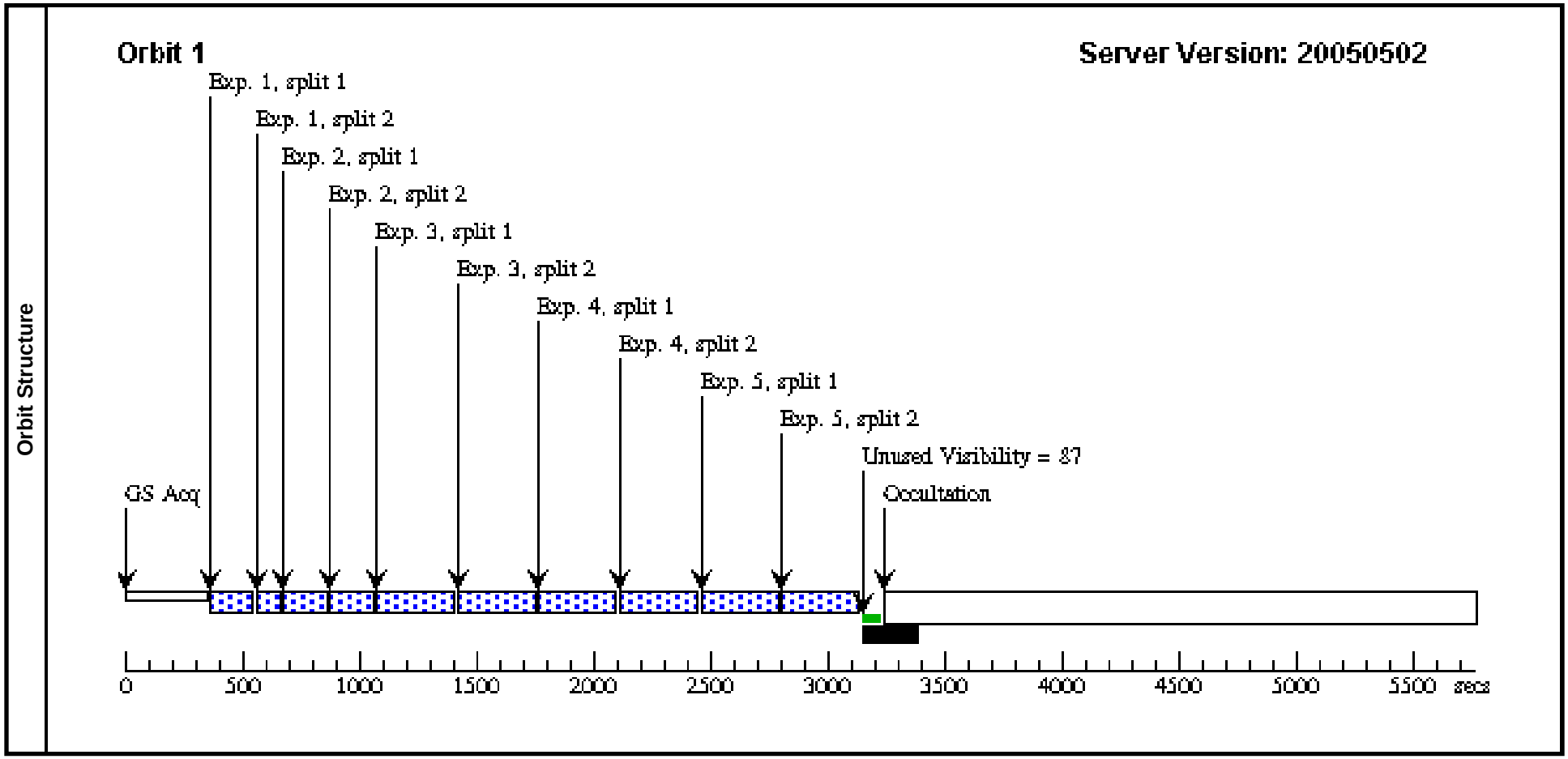
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (2) | NGC-4593 | RA: 12 39 39.4000 (189.9141667d)<br>Dec: -05 20 39.00 (-5.34417d)<br>Equinox: J2000<br>Plate Id: (?) | Redshift: 0.0090 | V=11.5 | Coordinate Source: NED |

*Comments: This object was generated by the targetselector and retrieved from the NED database.*

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (2) NGC-4593 | ACS/HRC, ACCUM, HRC | F550M | | | | 120.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 2 | | (2) NGC-4593 | ACS/HRC, ACCUM, HRC | F550M | | | | 300.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 3 | | (2) NGC-4593 | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 4 | | (2) NGC-4593 | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 5 | | (2) NGC-4593 | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |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Exp. 1, split 2
Exp. 2, split 1
Exp. 2, split 2
Exp. 3, split 1
Exp. 3, split 2
Exp. 4, split 1
Exp. 4, split 2
Exp. 5, split 1
Exp. 5, split 2
Unused Visibility = 87
GS Acq
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs

## Visit

**Proposal 10516, Visit 03** Mon Jun 20 16:13:27 GMT 2005

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/HRC

Special Requirements: (none)

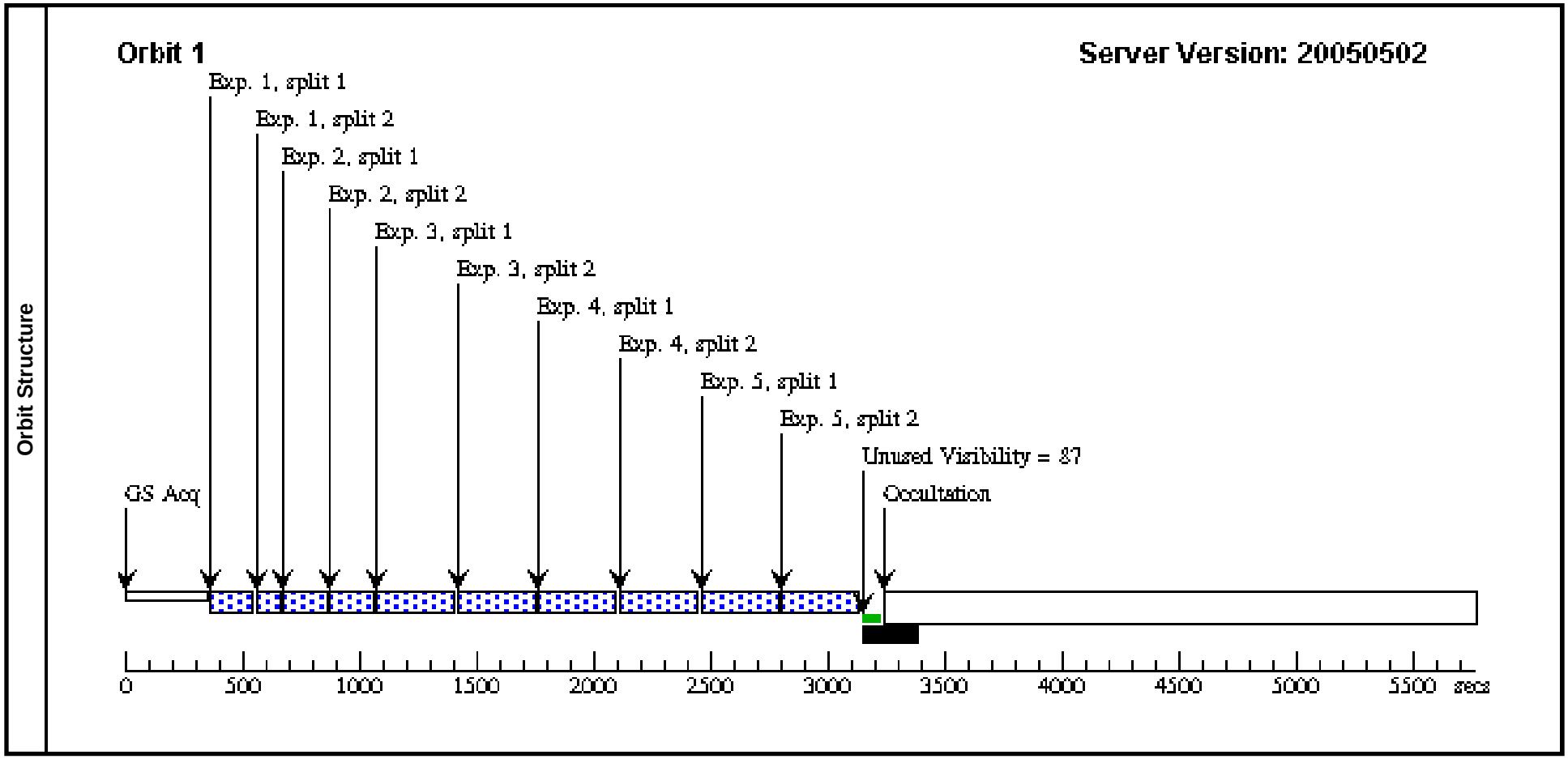
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (3) | NGC-7469 | RA: 23 03 15.6000 (345.8150000d)<br>Dec: +08 52 26.00 (8.87389d)<br>Equinox: J2000<br>Plate Id: (?) | Redshift: 0.01632 | V=13.0 | Coordinate Source: NED |

*Comments: This object was generated by the targetselector and retrieved from the NED database.*

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (3) NGC-7469 | ACS/HRC, ACCUM, HRC | F550M | | | | 120.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 2 | | (3) NGC-7469 | ACS/HRC, ACCUM, HRC | F550M | | | | 300.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 3 | | (3) NGC-7469 | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 4 | | (3) NGC-7469 | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 5 | | (3) NGC-7469 | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |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Exp. 1, split 2
Exp. 2, split 1
Exp. 2, split 2
Exp. 3, split 1
Exp. 3, split 2
Exp. 4, split 1
Exp. 4, split 2
Exp. 5, split 1
Exp. 5, split 2
Unused Visibility = 87
GS Acq
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs

## Visit

**Proposal 10516, Visit 04** Mon Jun 20 16:13:28 GMT 2005

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/HRC

Special Requirements: (none)

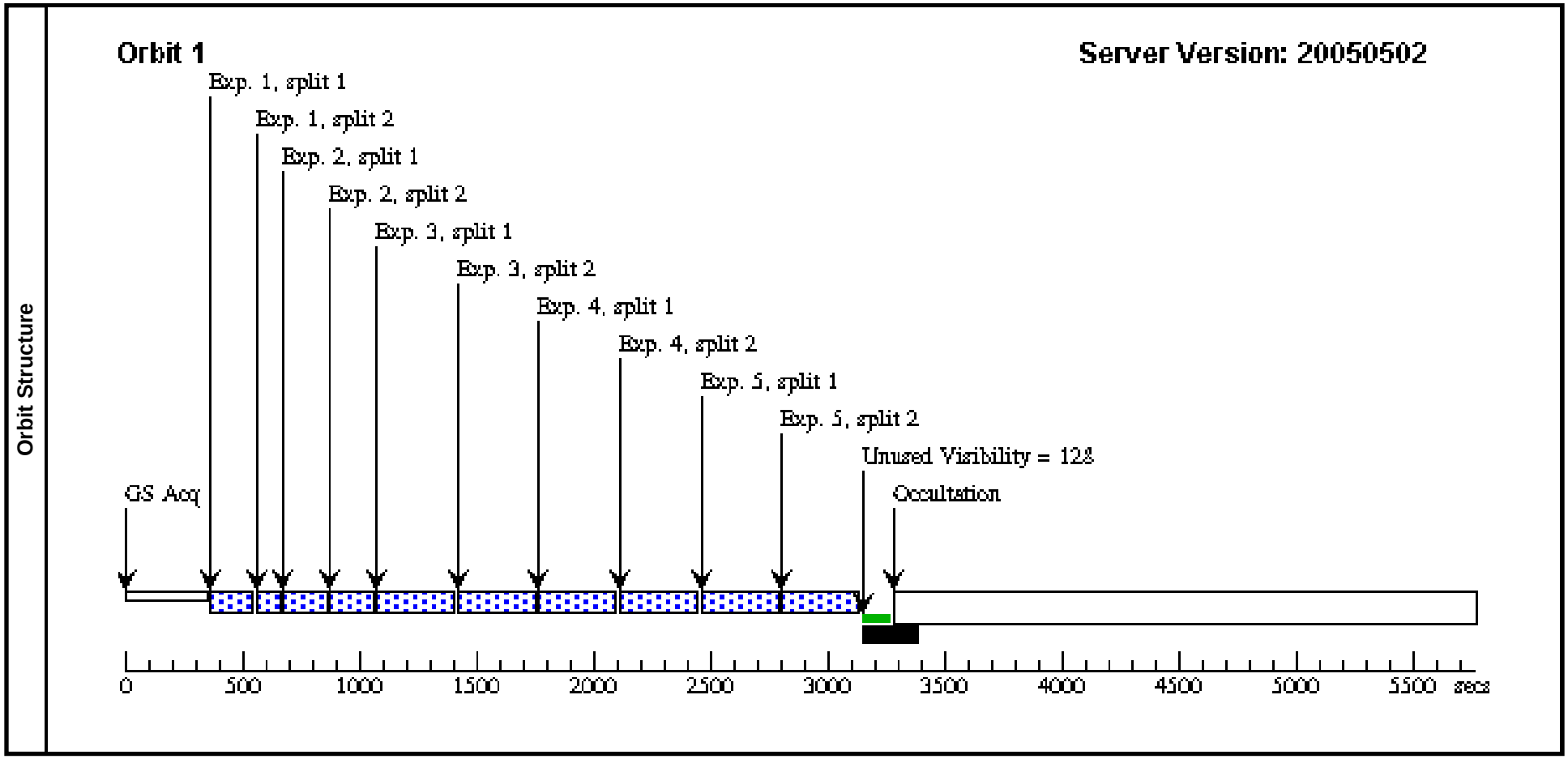
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (4) | IC-4329A | RA: 13 49 19.2000 (207.3300000d)<br>Dec: -30 18 34.00 (-30.30944d)<br>Equinox: J2000<br>Plate Id: (?) | Redshift: 0.01605 | V=14.0 | Coordinate Source: NED |

*Comments: This object was generated by the targetselector and retrieved from the NED database.*

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (4) IC-4329A | ACS/HRC, ACCUM, HRC | F550M | | | | 120.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 2 | | (4) IC-4329A | ACS/HRC, ACCUM, HRC | F550M | | | | 300.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 3 | | (4) IC-4329A | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 4 | | (4) IC-4329A | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |
| 5 | | (4) IC-4329A | ACS/HRC, ACCUM, HRC | F550M | | | | 600.0 Secs | |
| | | | | | | | | *[==>(Split 1)]*<br>*[==>(Split 2)]* | ***[1]*** |


Orbit Structure
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Server Version: 20050502
Exp. 1, split 1
Exp. 1, split 2
Exp. 2, split 1
Exp. 2, split 2
Exp. 3, split 1
Exp. 3, split 2
Exp. 4, split 1
Exp. 4, split 2
Exp. 5, split 1
Exp. 5, split 2
Unused Visibility = 128
GS Acq
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs