11165 - The Radius of the "Super-Neptune" HD 149026b

Cycle: 16, Proposal Category: GO

(Availability Mode: AVAILABLE)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Prof. Joshua Winn (PI)	**Massachusetts Institute of Technology**	**jwinn@mit.edu**
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Dr. Ronald L. Gilliland (CoI)	Space Telescope Science Institute	gillil@stsci.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) HD149026	NIC3	5	07-Feb-2008 21:37:22.0	yes
02	(1) HD149026	NIC3	5	07-Feb-2008 22:14:19.0	yes
03	(1) HD149026	NIC3	5	07-Feb-2008 22:51:00.0	yes
04	(1) HD149026	NIC3	5	07-Feb-2008 23:26:50.0	yes

20 Total Orbits Used

ABSTRACT

Current measurements suggest that the transiting exoplanet HD 149026b is a "super-Neptune," with an enormous heavy-element core. The existence of such a planet is a major challenge to planet formation theories. We propose to place the radius measurement on much firmer

footing, by obtaining a NICMOS light curve with 0.4 mmag precision and 13 sec cadence. We will improve the radius measurement by a factor of 2.3, and more importantly, the result will be more robust because we will determine the stellar radius directly from the data. Numerous attempts to do this from the ground have failed.

OBSERVING DESCRIPTION

HD 149026 will be observed in a special time series mode using the G141 grism as was tested in CAL/NIC 9642 and used in GO 9832. The approach for setting defocus will be adopted from CAL/NIC 11335 -- see text in Additional Comments below.

First orbits will include a specification of orbital phase for the observations, a direct image to fix wavelengths and some exposures at different count levels with the grism to internally verify linearity. Orbits 2-5 will be time series of 4.0 s exposures using STEP2, NSAMP=5.

Peak counts per pixel for the grism spectra should reach 85,000 e-, with sum over the full first order spectrum yielding 3.7e7 e- per exposure.

The phasing is critical. Following previous NICMOS experience we do not expect that Orbit 1 will be sufficiently stable to contribute to analyses. We need most of orbit 2 to be before the transit starts, and most of orbit 5 to be after transit ends in order to provide data during times of stable photometry to enable removal of systematics that correlate with HST

pointing, instrument temperature changes and focus drift. We also need the light curve composed of all four visits to yield nearly full phase coverage including ingress and egress.

ADDITIONAL COMMENTS

IMPLEMENTATION NOTES: Program uses NIC3-FIXD and CAMER-FOCUS= DEFOCUS optional parameter to repeat the degree of defocus used in GO-9832.

Visit

Proposal 11165, Visit 01, completed Fri Feb 08 04:28:28 GMT 2008

Diagnostic Status: Warning

Scientific Instruments: NIC3

Special Requirements: SCHED 80%; BETWEEN 21-DEC-2007:00:00:00 AND 24-DEC-2007:00:00:00; Period 2.8758882 D AND ZERO-PHASE JD2454272.7301

Comments: Phase and BETWEENs have been set with narrow ranges to select the 2007:356:02 opportunity identified via test scheduling. Should this, or any of the other narrow constraints on Visits 1-4 prove impossible to satisfy, then these will need to be revised to allow alternatives.

Diagnostics

(Visit 01) Warning (OP): VISIBILITY OVERRUN

(Visit 01) Warning (OP): VISIBILITY OVERRUN

(Visit 01) Warning (OP): VISIBILITY OVERRUN

(Visit 01) Warning (OP): VISIBILITY OVERRUN

(Visit 01) Warning (OP): VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD149026	RA: 16 30 29.6192 (247.6234133d) Dec: +38 20 50.32 (38.34731d) Equinox: J2000	Proper Motion RA: -0.00655s/yr Proper Motion Dec: 0.053"/yr Epoch of Position: 2000.0	V=8.16+/-0.05	Reference Frame: ICRS

Comments: Hipparcos position and proper motions.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	F166N	SAMP-SEQ=STEP2; NSAMP=3; CAMERA-FOCUS=DEFOCUS	POS TARG 6.2,-12.0; PHASE 0.925 TO 0.936		*[==>]*	***[1]***

Comments: Direct filter image. In focus would be at about 80% of saturation.

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
2		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2; NSAMP=5; CAMERA-FOCUS=DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

Comments: The POS TARGs used throughout these observations are intended to place the first order spectrum over x = 86-197, y = 63, i.e. on a very clean position in terms of flat field deviations and bad pixels. This is similar to position used previously for HD 209458 observations with minor tweak. Expected exposure level is about half of full well depth in center of spectrum.

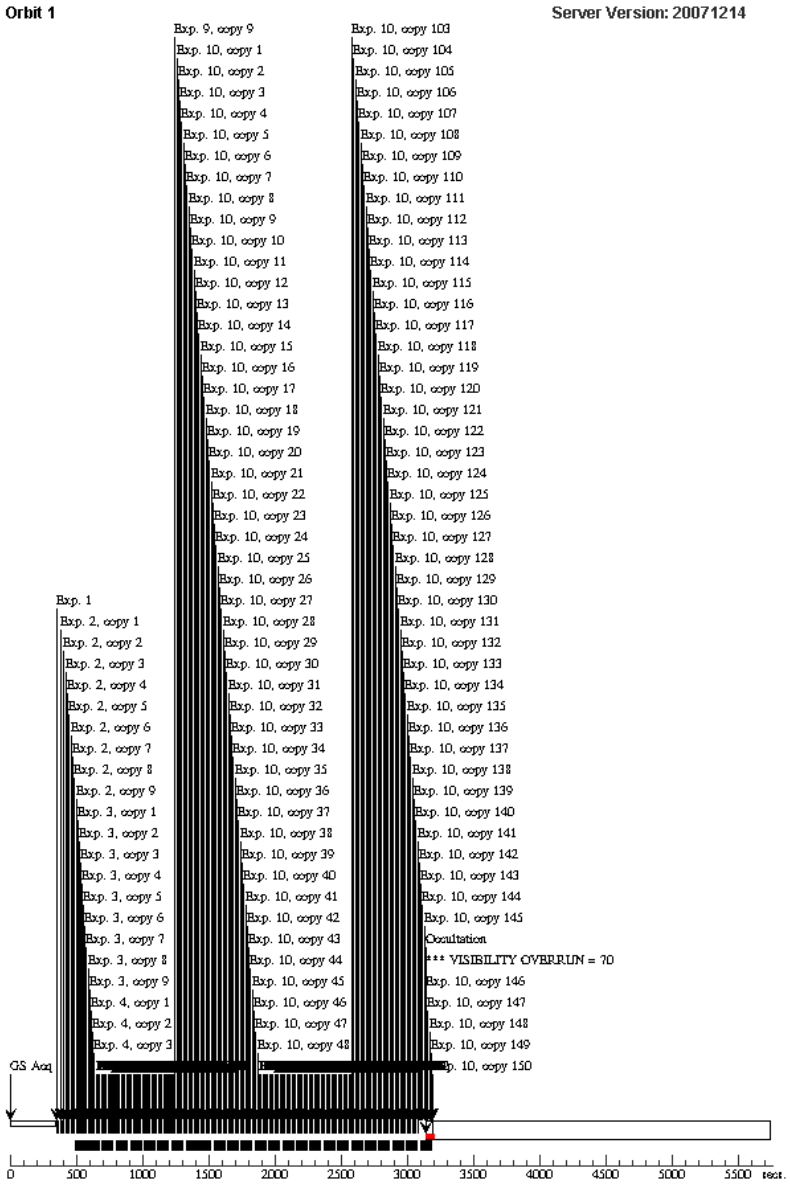
Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
3		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
4		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=5; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
5		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
6		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=5; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

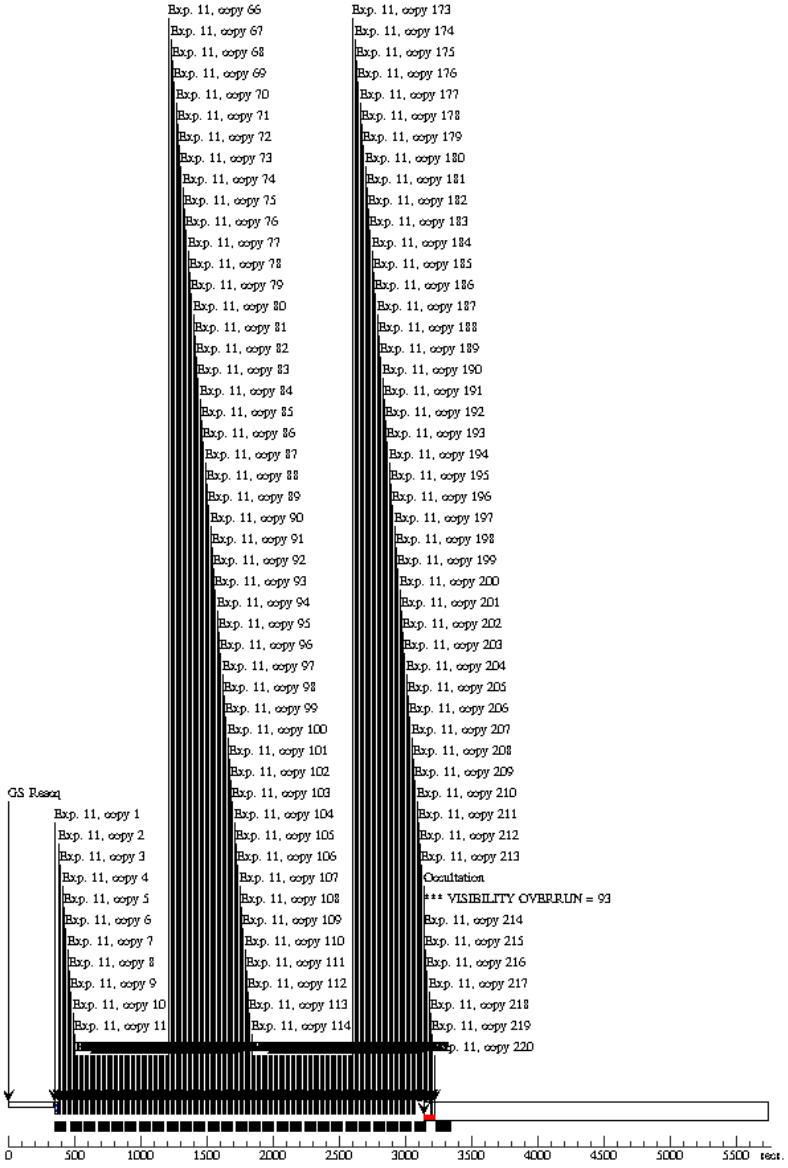
Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
7		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
8		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=5; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
9		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

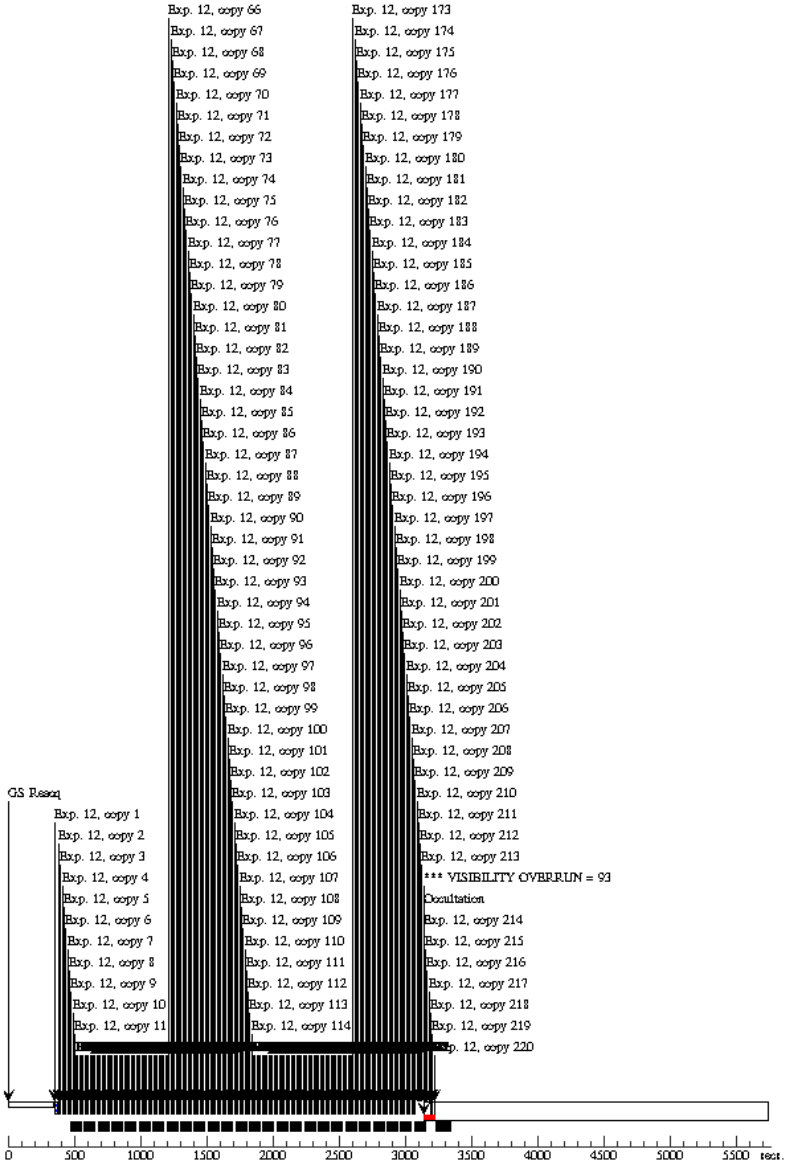
Orbit Structure



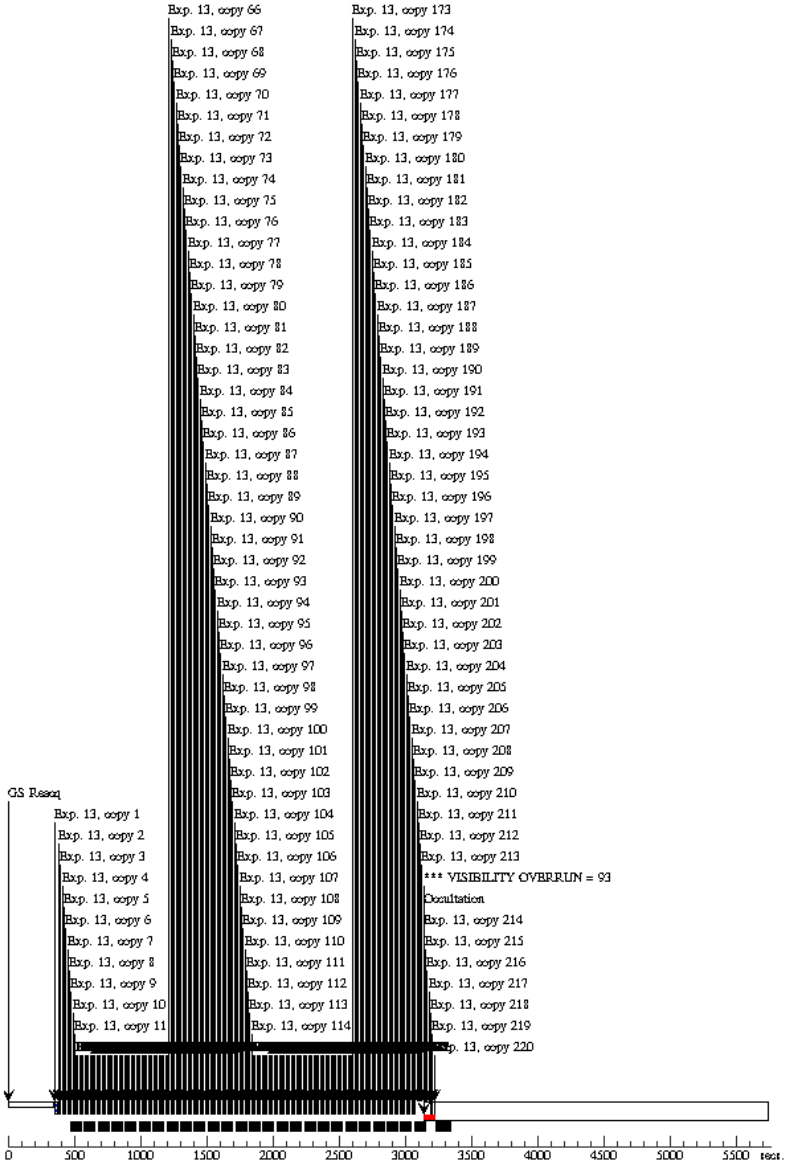
Orbit Structure (continued)



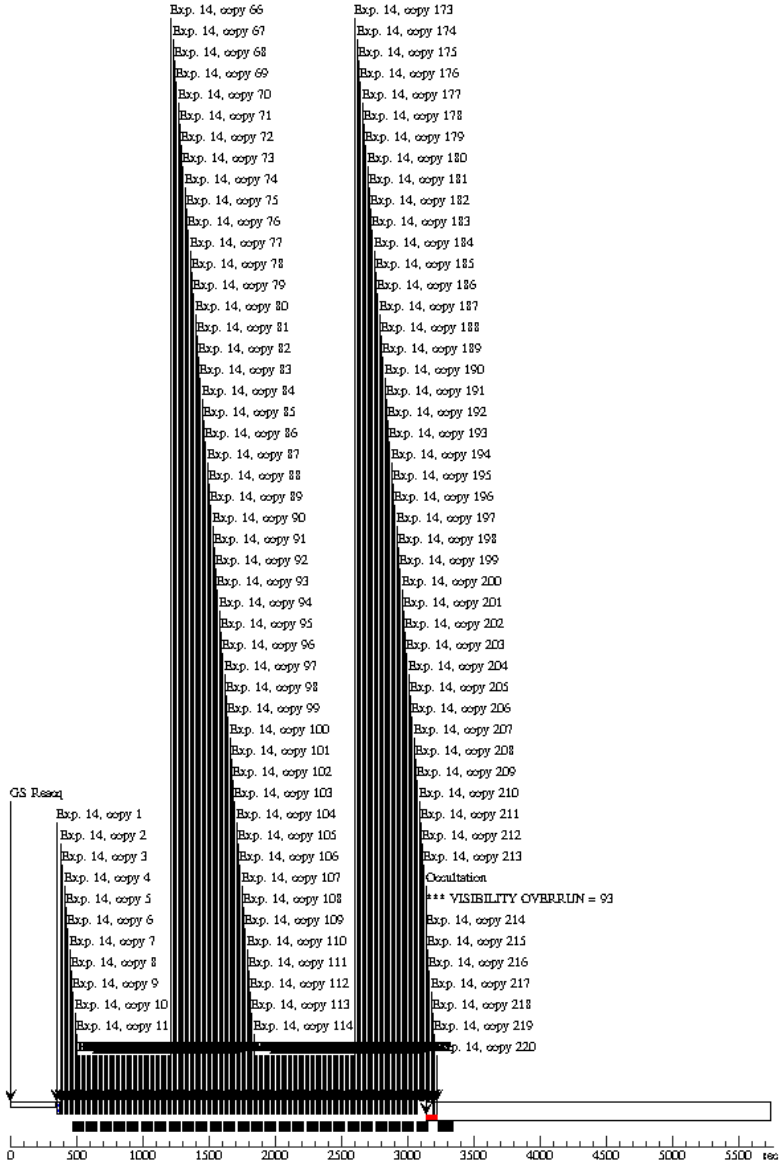
Orbit Structure (continued)



Orbit Structure (continued)



Orbit Structure (continued)



Visit

Proposal 11165, Visit 02, completed Fri Feb 08 04:28:38 GMT 2008

Diagnostic Status: Warning

Scientific Instruments: NIC3

Special Requirements: SCHED 80%; BETWEEN 23-DEC-2007:00:00:00 AND 26-DEC-2007:00:00:00; Period 2.8758882 D AND ZERO-PHASE JD2454272.7301

Comments: Narrow phase and BETWEEN constraints have been added to select a window at 2007:358:22 identified through early test scheduling. If unavailable in reality these will need to be changed.

Diagnostics

(Visit 02) Warning (OP): VISIBILITY OVERRUN

(Visit 02) Warning (OP): VISIBILITY OVERRUN

(Visit 02) Warning (OP): VISIBILITY OVERRUN

(Visit 02) Warning (OP): VISIBILITY OVERRUN

(Visit 02) Warning (OP): VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD149026	RA: 16 30 29.6192 (247.6234133d) Dec: +38 20 50.32 (38.34731d) Equinox: J2000	Proper Motion RA: -0.00655s/yr Proper Motion Dec: 0.053"/yr Epoch of Position: 2000.0	V=8.16+/-0.05	Reference Frame: ICRS

Comments: Hipparcos position and proper motions.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	F166N	SAMP-SEQ=STEP2 ; NSAMP=3; CAMERA-FOCUS =DEFOCUS	POS TARG 6.2,-12. 0; PHASE 0.921 TO 0. 932		*[==>]*	***[1]***
Comments: Direct filter image. In focus would be at about 80% of saturation.									
2		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=5; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

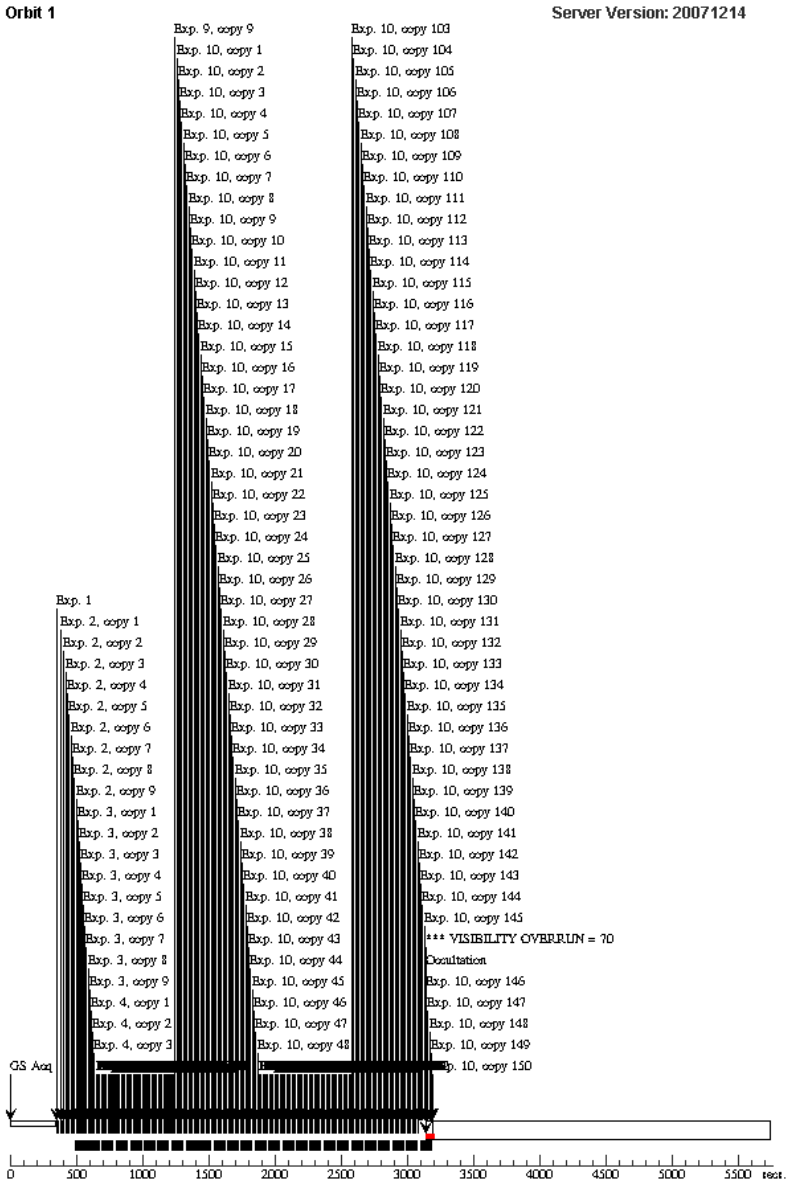
Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
3		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
4		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=5; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
5		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
6		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=5; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

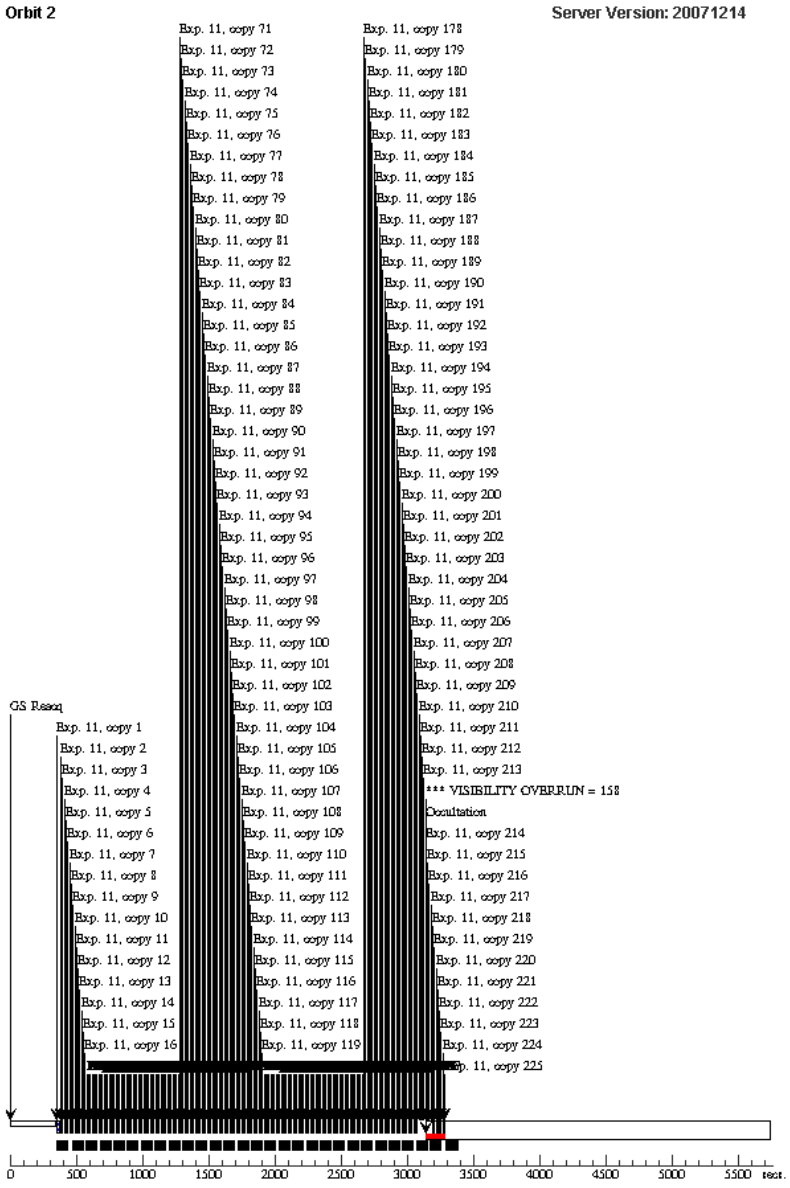
Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
7		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
8		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=5; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
9		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

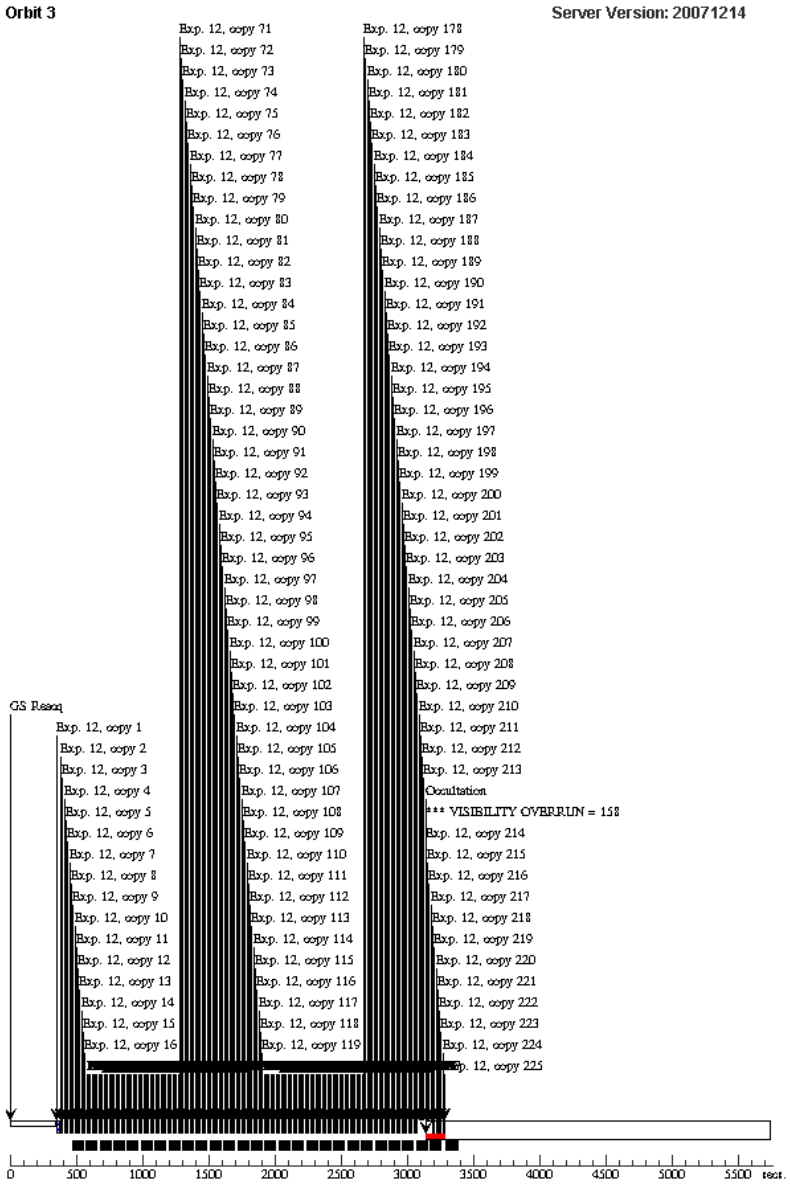
Orbit Structure



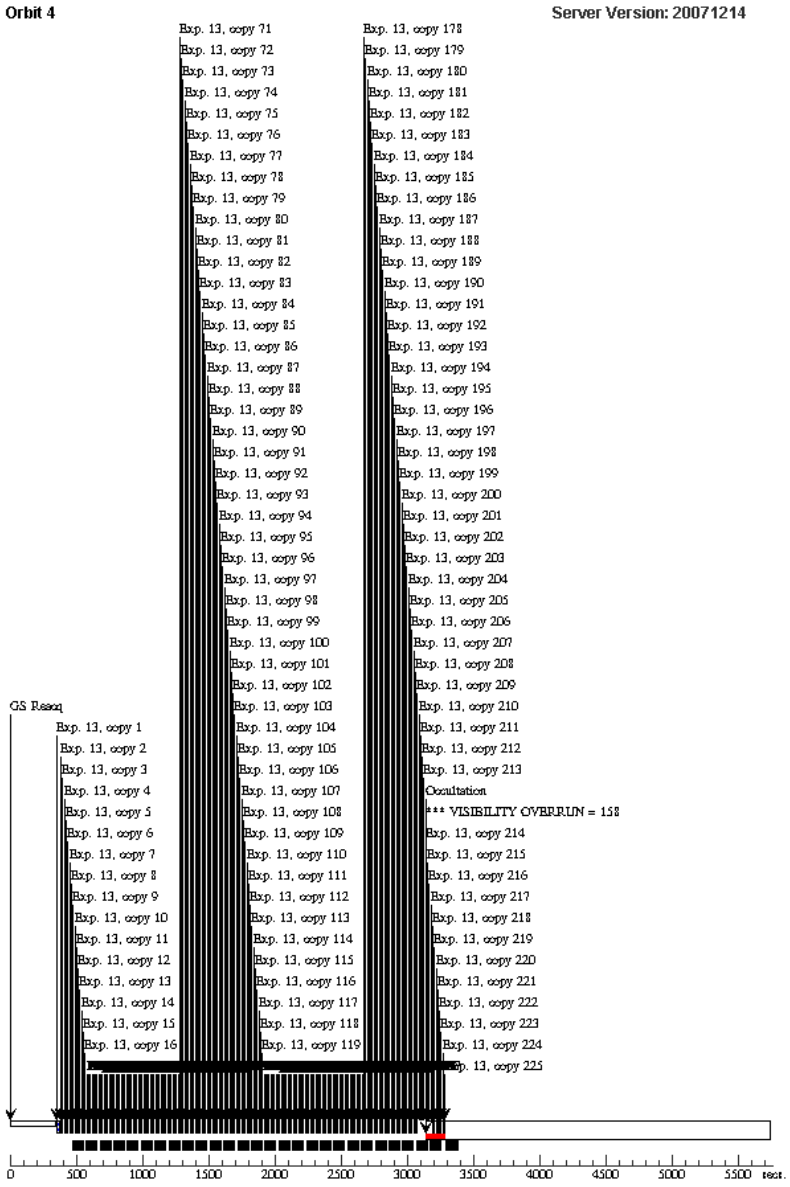
Orbit Structure (continued)



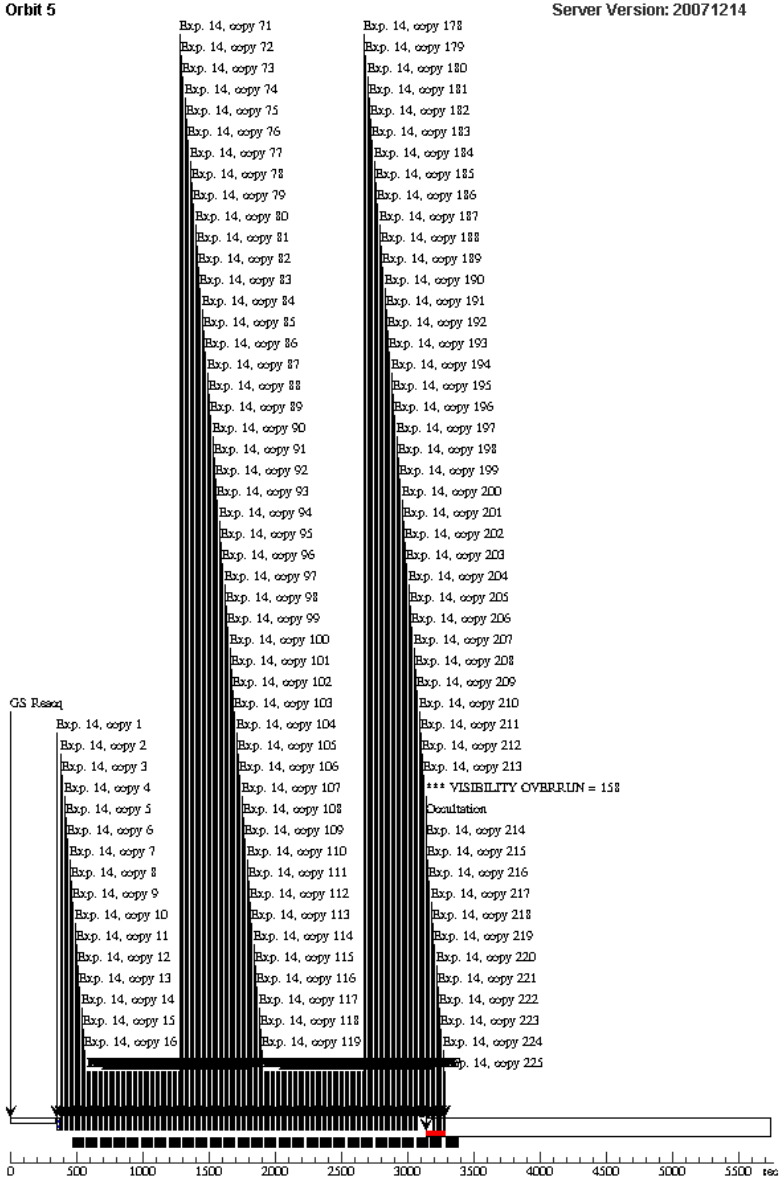
Orbit Structure (continued)



Orbit Structure (continued)



Orbit Structure (continued)



Visit

Proposal 11165, Visit 03, implementation Fri Feb 08 04:28:46 GMT 2008

Diagnostic Status: Warning

Scientific Instruments: NIC3

Special Requirements: SCHED 80%; BETWEEN 19-MAR-2008:00:00:00 AND 22-MAR-2008:00:00:00; Period 2.8758882 D AND ZERO-PHASE JD2454272.7301

Comments: A narrow phase and BETWEEN window have been set to select for the 2008:080 opportunity identified through test scheduling. If unavailable then these will need to be changed.

Diagnostics

(Visit 03) Warning (OP): VISIBILITY OVERRUN

(Visit 03) Warning (OP): VISIBILITY OVERRUN

(Visit 03) Warning (OP): VISIBILITY OVERRUN

(Visit 03) Warning (OP): VISIBILITY OVERRUN

(Visit 03) Warning (OP): VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD149026	RA: 16 30 29.6192 (247.6234133d) Dec: +38 20 50.32 (38.34731d) Equinox: J2000	Proper Motion RA: -0.00655s/yr Proper Motion Dec: 0.053"/yr Epoch of Position: 2000.0	V=8.16+/-0.05	Reference Frame: ICRS

Comments: Hipparcos position and proper motions.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	F166N	SAMP-SEQ=STEP2 ; NSAMP=3; CAMERA-FOCUS =DEFOCUS	POS TARG 6.2,-12. 0; PHASE 0.933 TO 0. 944		*[==>]*	***[1]***
Comments: Direct filter image. In focus would be at about 80% of saturation.									
2		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=5; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

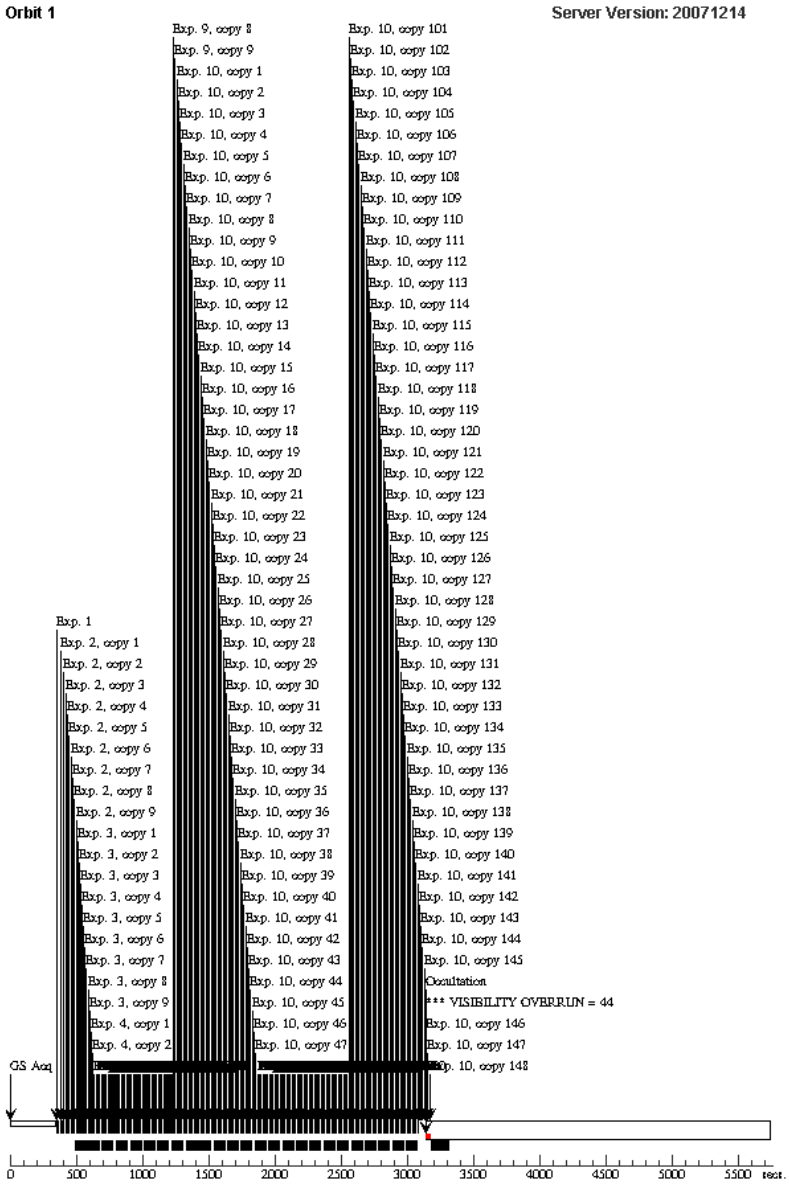
Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
3		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2; NSAMP=4; CAMERA-FOCUS=DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
4		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2; NSAMP=5; CAMERA-FOCUS=DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
5		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2; NSAMP=4; CAMERA-FOCUS=DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
6		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2; NSAMP=5; CAMERA-FOCUS=DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

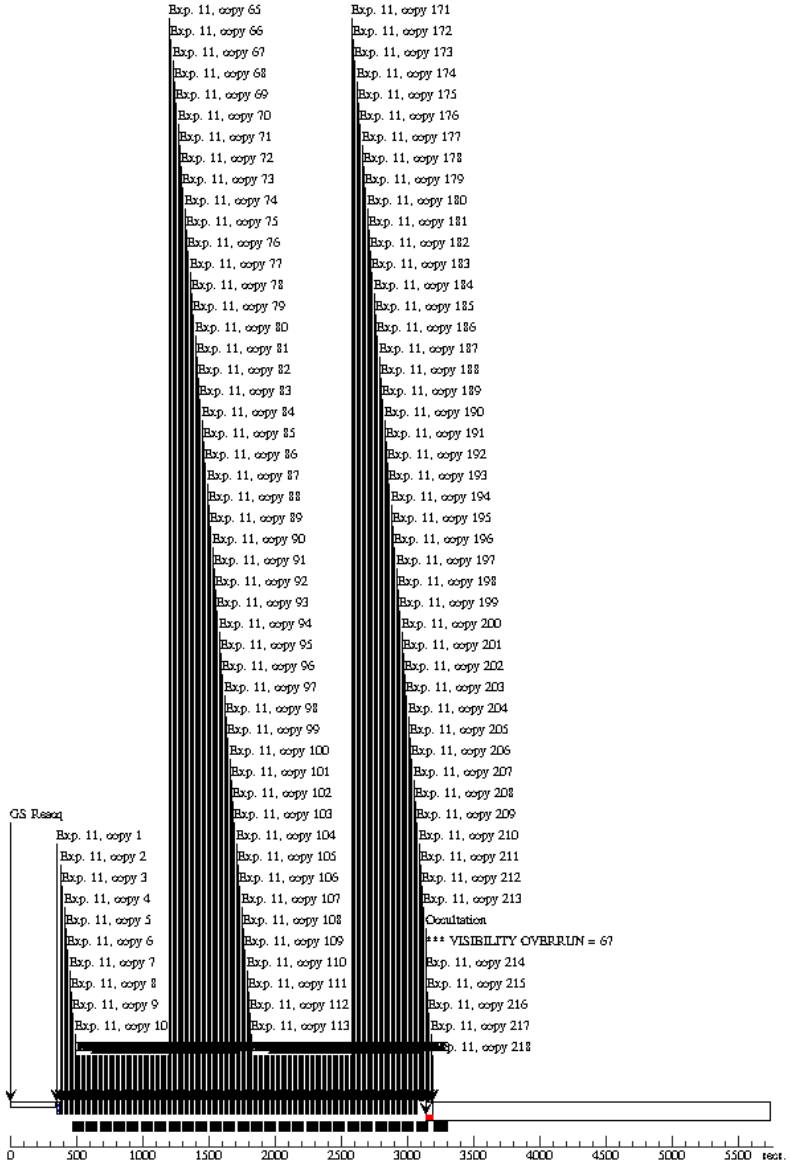
Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
7		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
8		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=5; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
9		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

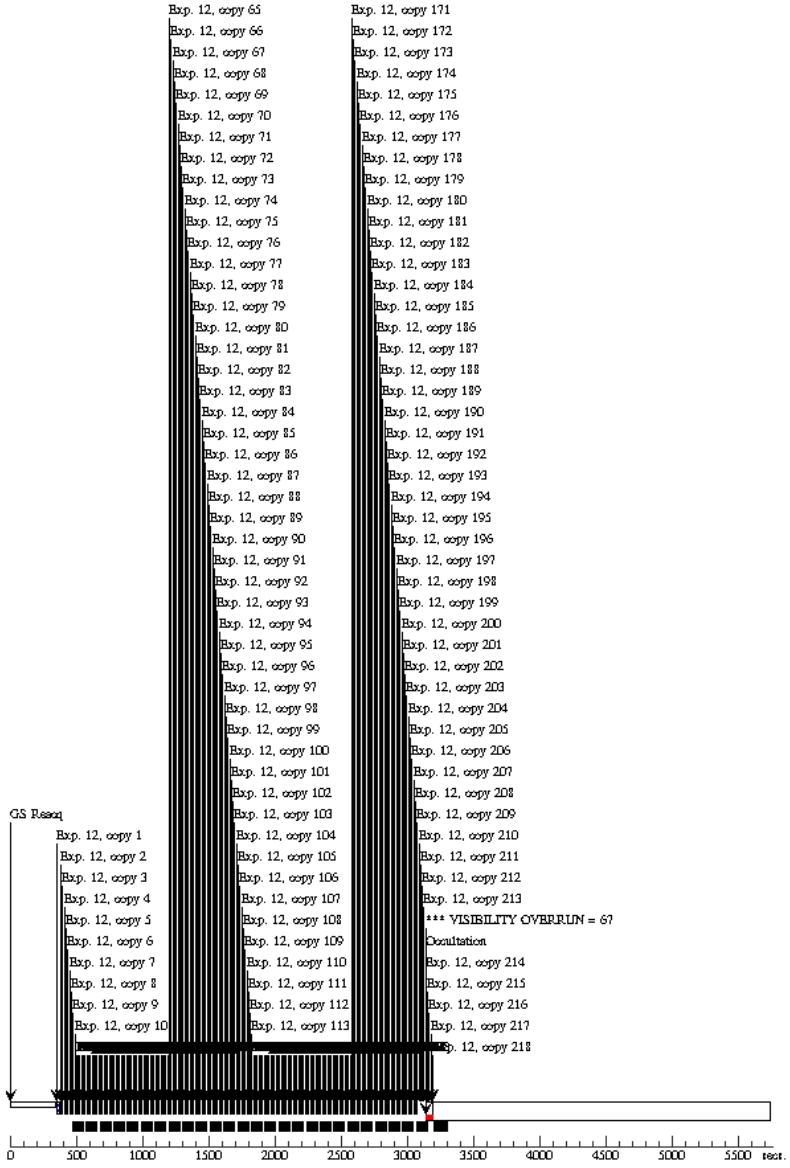
Orbit Structure



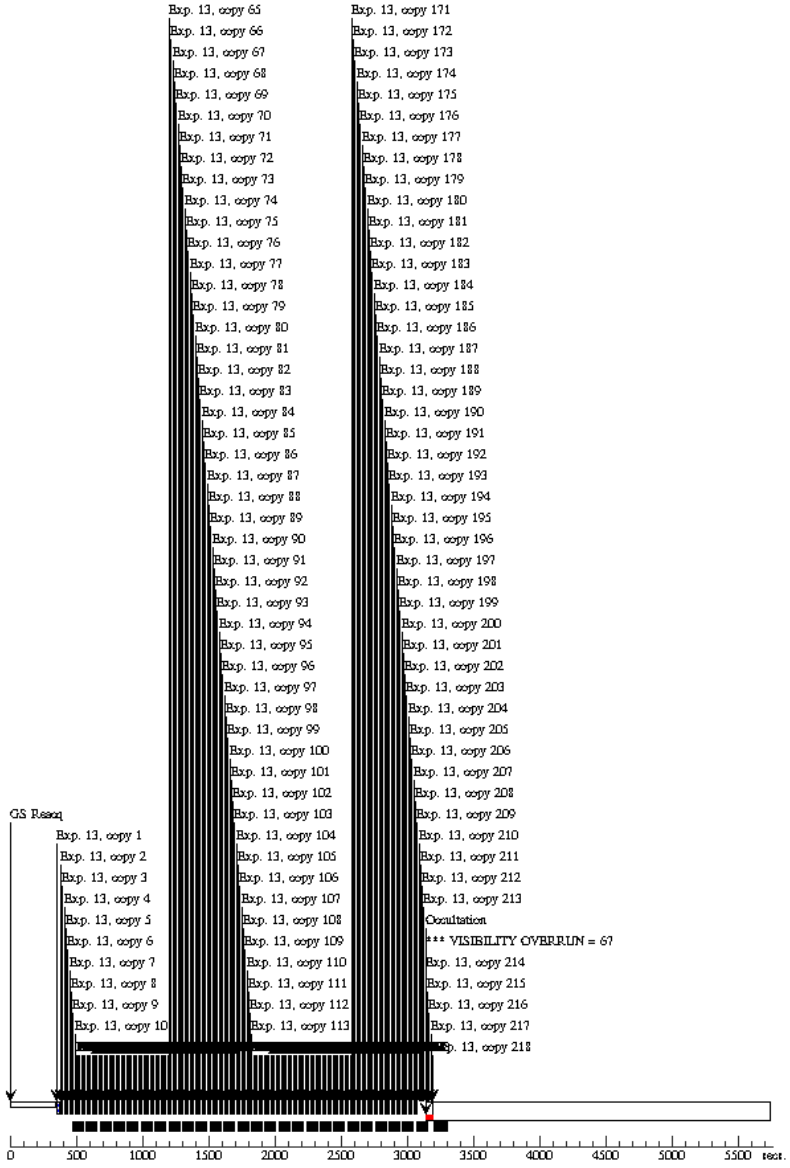
Orbit Structure (continued)



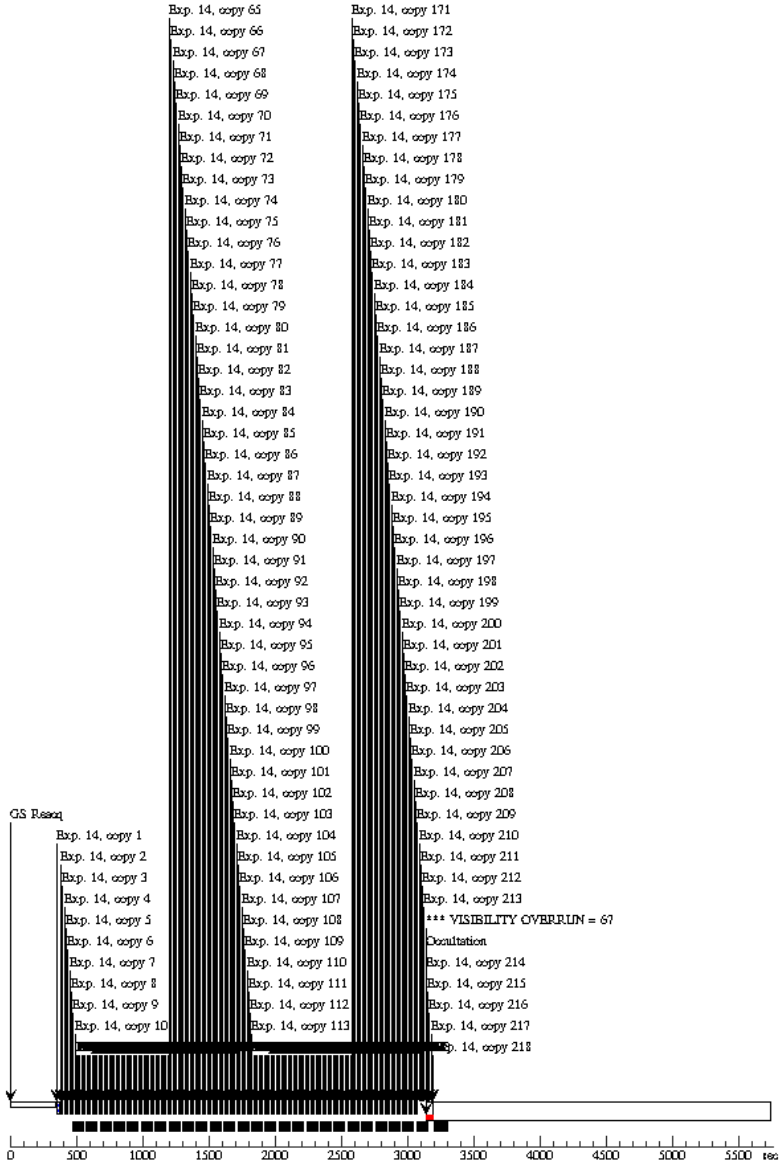
Orbit Structure (continued)



Orbit Structure (continued)



Orbit Structure (continued)



Visit

Proposal 11165, Visit 04, scheduling Fri Feb 08 04:28:53 GMT 2008

Diagnostic Status: Warning

Scientific Instruments: NIC3

Special Requirements: SCHED 80%; BETWEEN 07-FEB-2008:00:00:00 AND 10-FEB-2008:00:00:00; Period 2.8758882 D AND ZERO-PHASE JD2454272.7301

Comments: Narrow phase and BETWEEN windows have been selected to place this in a 2008:039:23 opportunity identified through test scheduling. If unavailable, then these will need to be changed.

Diagnostics

(Visit 04) Warning (OP): VISIBILITY OVERRUN

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Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD149026	RA: 16 30 29.6192 (247.6234133d) Dec: +38 20 50.32 (38.34731d) Equinox: J2000	Proper Motion RA: -0.00655s/yr Proper Motion Dec: 0.053"/yr Epoch of Position: 2000.0	V=8.16+/-0.05	Reference Frame: ICRS

Comments: Hipparcos position and proper motions.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	F166N	SAMP-SEQ=STEP2 ; NSAMP=3; CAMERA-FOCUS =DEFOCUS	POS TARG 6.2,-12. 0; PHASE 0.925 TO 0. 936		*[==>]*	***[1]***
Comments: Direct filter image. In focus would be at about 80% of saturation.									
2		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=5; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

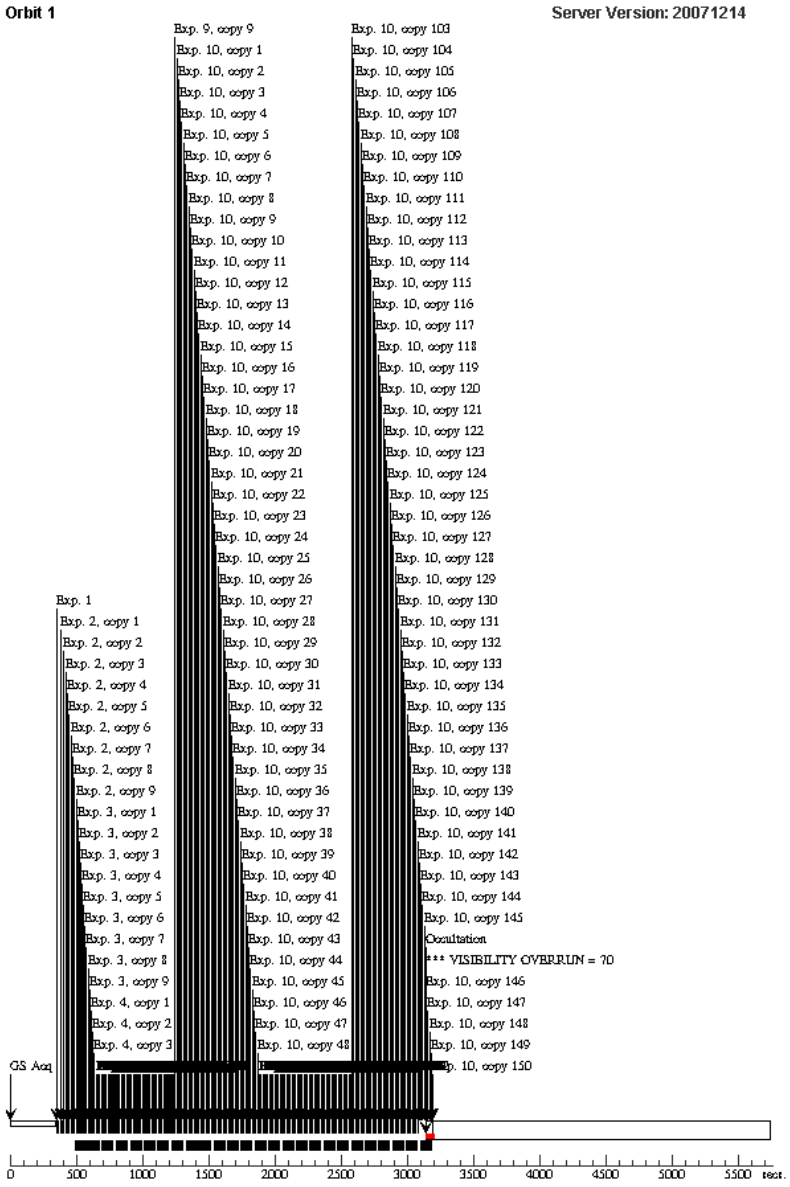
Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
3		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2; NSAMP=4; CAMERA-FOCUS=DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
4		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2; NSAMP=5; CAMERA-FOCUS=DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
5		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2; NSAMP=4; CAMERA-FOCUS=DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
6		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2; NSAMP=5; CAMERA-FOCUS=DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

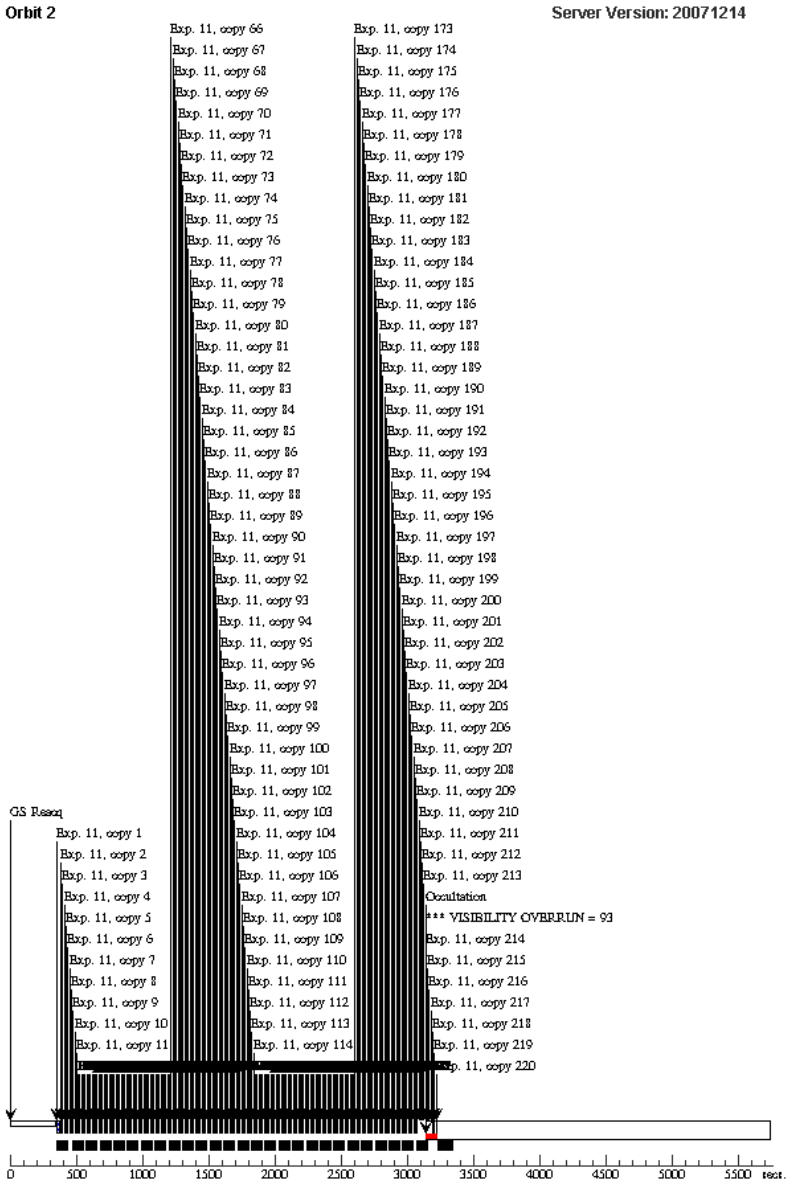
Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
7		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
8		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=5; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***
9		(1) HD149026	NIC3, MULTIACCUM, NIC3-FIXD	G141	SAMP-SEQ=STEP2 ; NSAMP=4; CAMERA-FOCUS =DEFOCUS	SAME POS AS 1		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

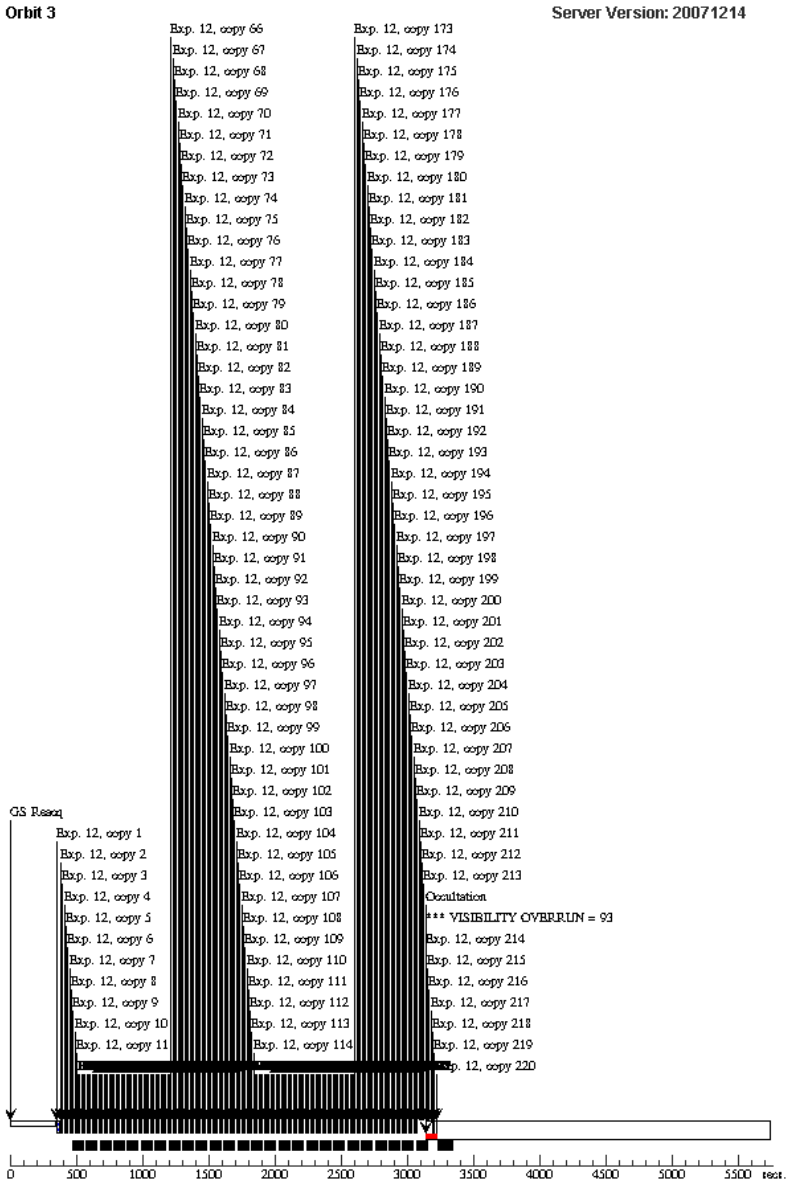
Orbit Structure



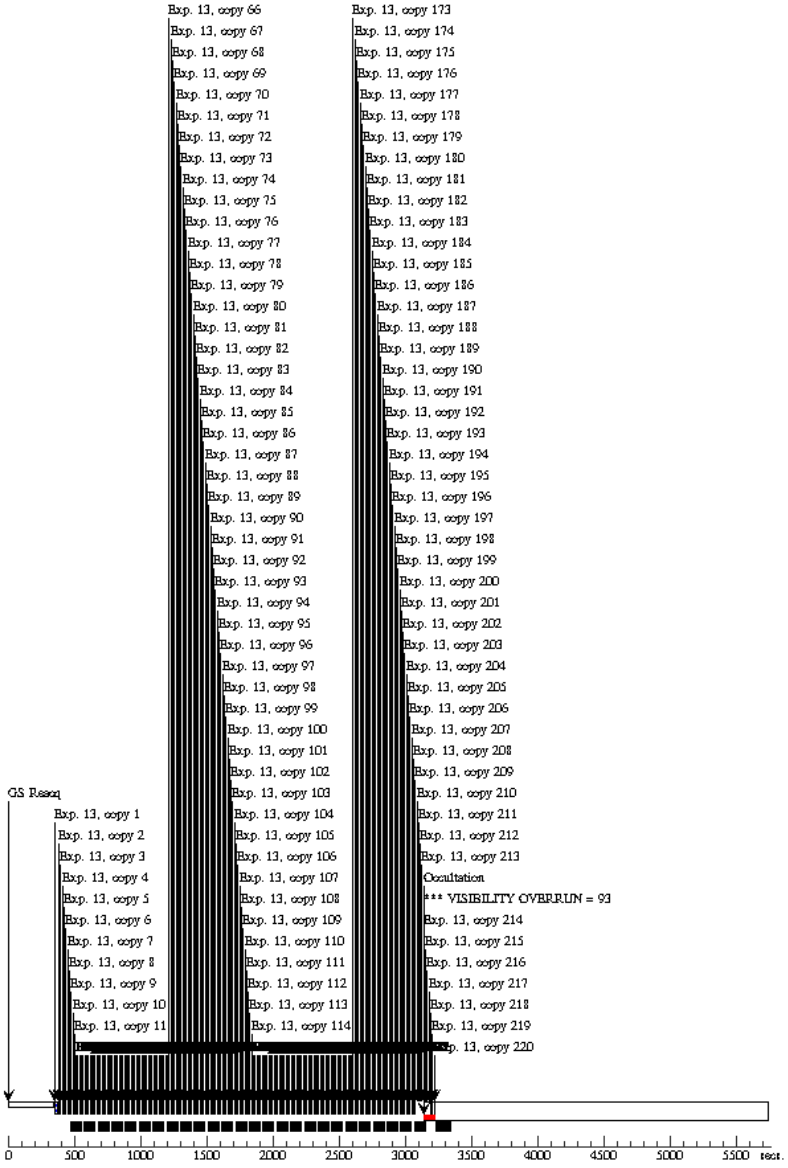
Orbit Structure (continued)



Orbit Structure (continued)



Orbit Structure (continued)



Orbit Structure (continued)