13026 - XMM-Newton Target of Opportunity of Tidal Disruption Events

Cycle: 20, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
03	(3) ASASSN-14AE	WFC3/UVIS	1	27-Mar-2015 21:00:42.0	yes
05	(3) ASASSN-14AE	WFC3/UVIS	1	27-Mar-2015 21:00:44.0	yes
04	(4) ASASSN-14LI	WFC3/UVIS	1	27-Mar-2015 21:00:46.0	yes
06	(4) ASASSN-14LI	WFC3/UVIS	1	27-Mar-2015 21:00:48.0	yes

4 Total Orbits Used

ABSTRACT

Tidal disruption events (TDEs), where a star is disrupted by a massive black hole provide a unique probe. They illuminate dynamics in galactic nuclei, and may provide constraints on rates of low frequency gravitational wave transients. A handful of candidates have been uncovered, with our recent discovery of a new class of relativistic TDE dramatically adding to the breadth of the population. Here we propose to characterise the spectral

and temporal properties of of up to two TDEs found in AO11. As part of a multiwavelength campaign we will use XMM-Newton and HST to track the temperature; search for evidence of non-thermal components and study the long and short timescale variability. In doing so we will create unique panchromatic pictures of these events for the first time.

OBSERVING DESCRIPTION

We seek to obtain UV imaging observations of two tidal disruption events. We will utilize F225W or F275W (or both) depending on the properties of the TDE. The aim of the proposal is to

i) map the UV emission from the tidal disruption event and

ii) precisely position the candidate on its host, relative to the likely locaiton of the black hole.

For this latter aim we also ask to be able to use F606W. This provides a much higher signal to noise for ascertaining a centroid and crucially provides a larger number of background objects for relative astrometry between two epochs of observations. Recent improvements in astrometry utilize galaxies to remove the scatter from the proper motions of stars, but we will only have a sufficient number of galaxies for comparison in cases where a redder filter is used.

For the UV observations we have placed the source close to the corner of the chip to mitigate CTE. For the optical observations the source is displaced in this direction, but remains closer to the centre of the chip for improved astrometry if latter observations are taken at different roll angles.

Visit

Proposal 13026, Visit 03, completed Sat Mar 28 01:00:49 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	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), (2)

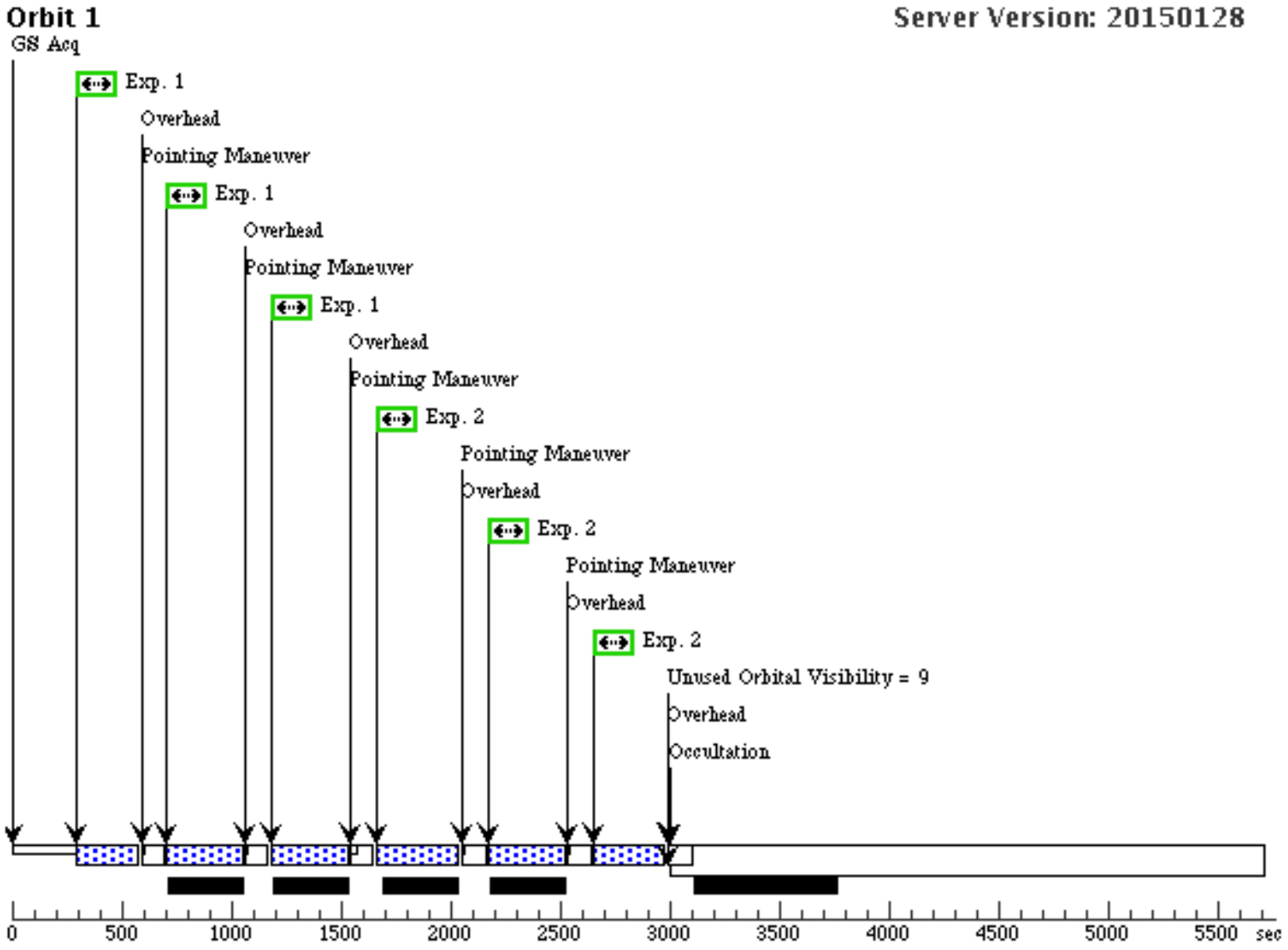
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	ASASSN-14AE	RA: 11 08 40.1100 (167.1671250d) Dec: +34 05 52.20 (34.09783d) Equinox: J2000		V=17+/-1	Reference Frame: SDSS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) ASASSN-14AE	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG -30,0	Pattern 2, Exps 1-1 in Visit 03 (2)	300 Secs (950 Secs) *[==>250.0 Secs (Pattern 1)]* *[==>350.0 Secs (Pattern 2)]* *[==>350.0 Secs (Pattern 3)]*	***[1]***
2		(3) ASASSN-14AE	WFC3/UVIS, ACCUM, UVIS2	F275W	CR-SPLIT=NO; FLASH=12	POS TARG -60,-20	Pattern 2, Exps 2-2 in Visit 03 (2)	375 Secs (1020 Secs) *[==>350.0 Secs (Pattern 1)]* *[==>350.0 Secs (Pattern 2)]* *[==>320.0 Secs (Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 13026, Visit 05 Sat Mar 28 01:00:49 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; SAME ORIENT AS 03; BEFORE 30-JUN-2015:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	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), (2)

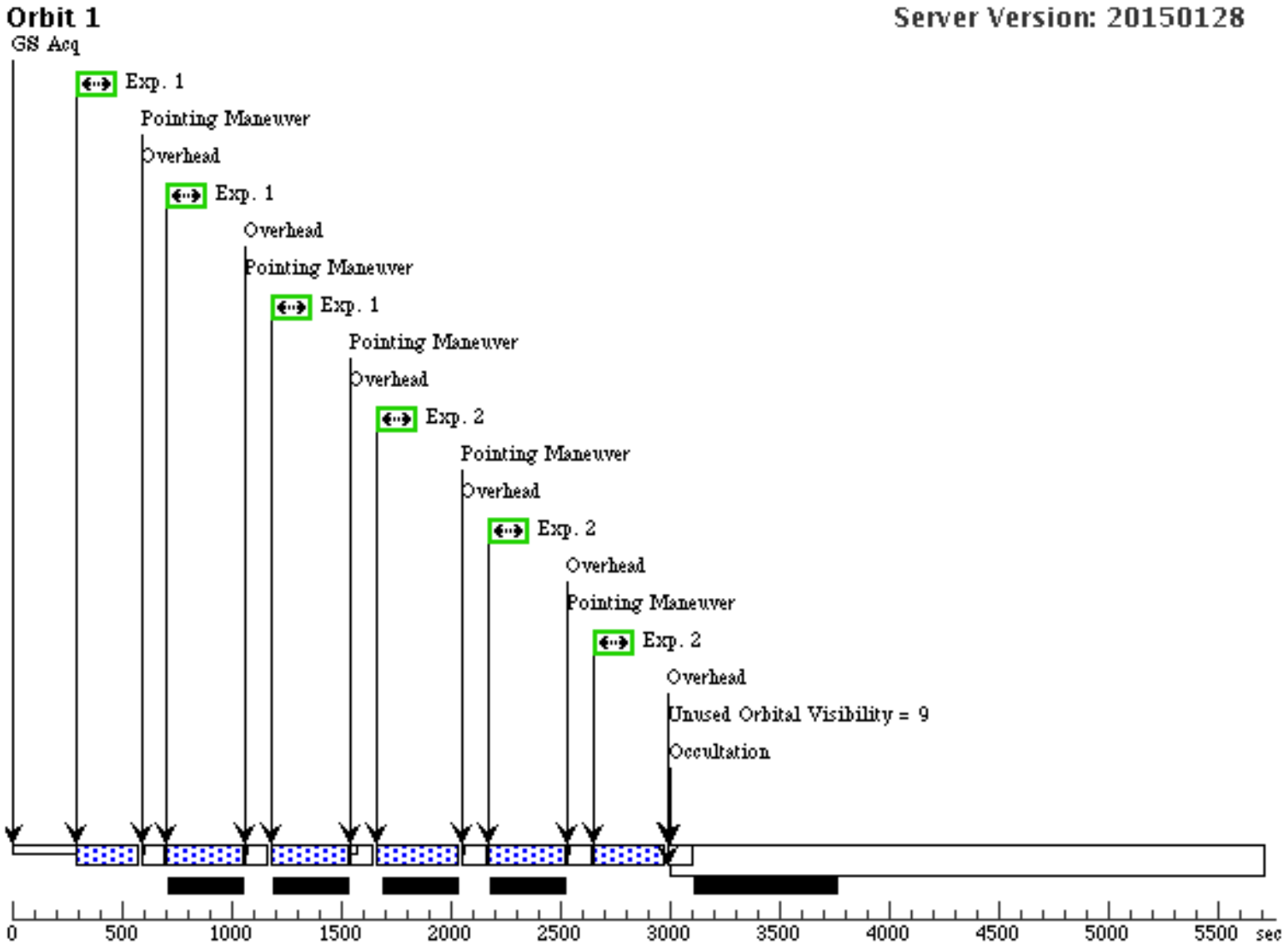
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	ASASSN-14AE	RA: 11 08 40.1100 (167.1671250d) Dec: +34 05 52.20 (34.09783d) Equinox: J2000		V=17+/-1	Reference Frame: SDSS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) ASASSN-14AE	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG -30,0	Pattern 2, Exps 1-1 in Visit 05 (2)	300 Secs (950 Secs) *[==>250.0 Secs (Pattern 1)]* *[==>350.0 Secs (Pattern 2)]* *[==>350.0 Secs (Pattern 3)]*	***[1]***
2		(3) ASASSN-14AE	WFC3/UVIS, ACCUM, UVIS2	F275W	CR-SPLIT=NO; FLASH=12	POS TARG -60,-20	Pattern 2, Exps 2-2 in Visit 05 (2)	375 Secs (1020 Secs) *[==>350.0 Secs (Pattern 1)]* *[==>350.0 Secs (Pattern 2)]* *[==>320.0 Secs (Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 13026, Visit 04, completed Sat Mar 28 01:00:50 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; ON HOLD

On Hold Comments: Awaiting trigger criteria (TDE)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	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		(3)
(3)	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)

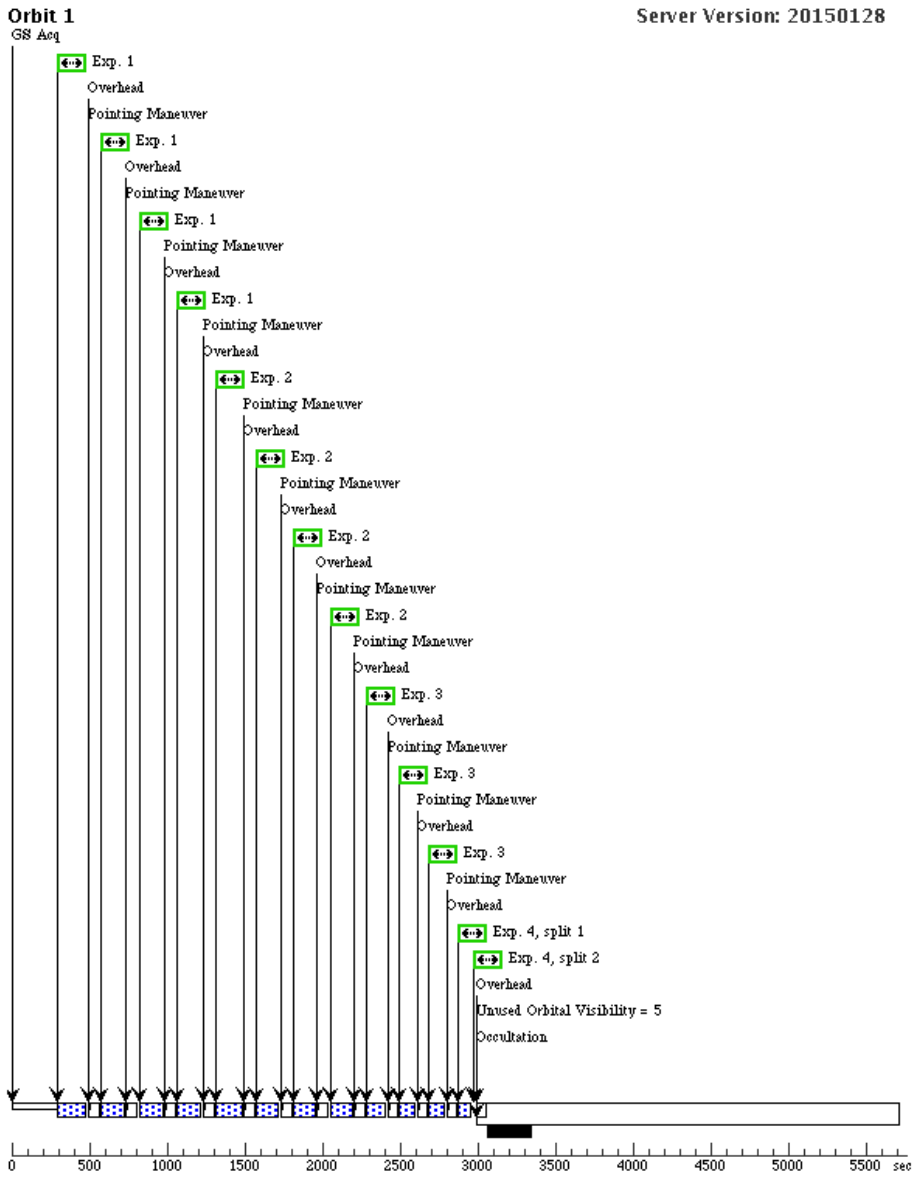
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	ASASSN-14LI	RA: 12 48 15.2300 (192.0634583d) Dec: +17 46 26.22 (17.77395d) Equinox: J2000		V=17	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) ASASSN-14LI	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F225W	FLASH=12; CR-SPLIT=NO		Pattern 3, Exps 1-1 in Visit 04 (3)	150 Secs (600 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	 ***[1]***
2		(4) ASASSN-14LI	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F275W	CR-SPLIT=NO; FLASH=12		Pattern 3, Exps 2-2 in Visit 04 (3)	140 Secs (560 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	 ***[1]***
3		(4) ASASSN-14LI	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F621M	CR-SPLIT=NO		Pattern 2, Exps 3-3 in Visit 04 (2)	100 Secs (300 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***
4		(4) ASASSN-14LI	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F621M	CR-SPLIT=2			10 Secs (10 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***

Orbit Structure



Visit

Proposal 13026, Visit 06 Sat Mar 28 01:00:50 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; SAME ORIENT AS 04; BEFORE 01-FEB-2016:00:00:00; ON HOLD

On Hold Comments: Awaiting trigger criteria (TDE)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	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		(3)
(3)	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)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	ASASSN-14LI	RA: 12 48 15.2300 (192.0634583d) Dec: +17 46 26.22 (17.77395d) Equinox: J2000		V=17	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) ASASSN-14LI	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F225W	FLASH=12; CR-SPLIT=NO		Pattern 3, Exps 1-1 in Visit 06 (3)	150 Secs (600 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2		(4) ASASSN-14LI	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F275W	CR-SPLIT=NO; FLASH=12		Pattern 3, Exps 2-2 in Visit 06 (3)	150 Secs (600 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(4) ASASSN-14LI	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F621M	CR-SPLIT=NO		Pattern 2, Exps 3-3 in Visit 06 (2)	150 Secs (450 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure