14357 - Identify the signature of neutron star mergers through rapid Chandra/Hubble observations of a short GRB

Cycle: 23, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Eleonora TROJA (PI) (Contact)	**University of Maryland**	**eleonora.troja@nasa.gov**
Dr. Stephen Bradley Cenko (CoI) (Contact)	NASA Goddard Space Flight Center	brad.cenko@nasa.gov
Dr. Taka Sakamoto (CoI)	Aoyama Gakuin University	tsakamoto@phys.aoyama.ac.jp
Dr. Neil Gehrels (CoI)	NASA Goddard Space Flight Center	neil.gehrels@nasa.gov
Nobuyuki Kawai (CoI)	Tokyo Institute of Technology - TIT	nkawai@phys.titech.ac.jp
Dr. Amy Lien (CoI)	NASA Goddard Space Flight Center	amy.y.lien@nasa.gov

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) SHORT-GRB	ACS/WFC	1	29-Jul-2016 13:30:05.0	yes
02	(1) SHORT-GRB	WFC3/IR	1	29-Jul-2016 13:30:06.0	yes
03	(1) SHORT-GRB	WFC3/IR	1	29-Jul-2016 13:30:07.0	yes
04	(1) SHORT-GRB	ACS/WFC	1	29-Jul-2016 13:30:08.0	yes
05	(1) SHORT-GRB	WFC3/IR	1	29-Jul-2016 13:30:09.0	yes
06	(1) SHORT-GRB	WFC3/IR	1	29-Jul-2016 13:30:09.0	yes

6 Total Orbits Used

ABSTRACT

The afterglow of some short GRBs displays a late-time rebrightening, visible a few days after the gamma-ray burst. Recent HST observations provided tantalizing evidence that such late-time bump could be explained as the emergence of the underlying kilonova emission. This would represent the incontrovertible signature of a neutron star merger, and the first direct link between short GRBs and their progenitors. Here we ask for a rapid and deep Chandra/HST follow-up observation of a short duration GRB in order to detect the expected kilonova bump, and to constrain the origin of the observed emission. Multi-band observations, and in particular X-rays, are critical to pin down the nature of the observed rebrightening, and to distinguish it from the standard afterglow emission.

OBSERVING DESCRIPTION

We request two initial epochs to check for the kilonova onset. The third epoch will be planned at a later time if necessary.

Each epoch will consist of three orbits. The first visit should happen in 3 days since the ToO activation. The second visit in 7 days since the ToO activation.

The total request is 6 orbits.

Visit

Proposal 14357, VISIT1 (01), implementation Fri Jul 29 17:30:10 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: SCHED 100%; ON HOLD ; TOO RESPONSE TIME 3.0D

On Hold Comments: GRB trigger

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1)

Fixed Targets

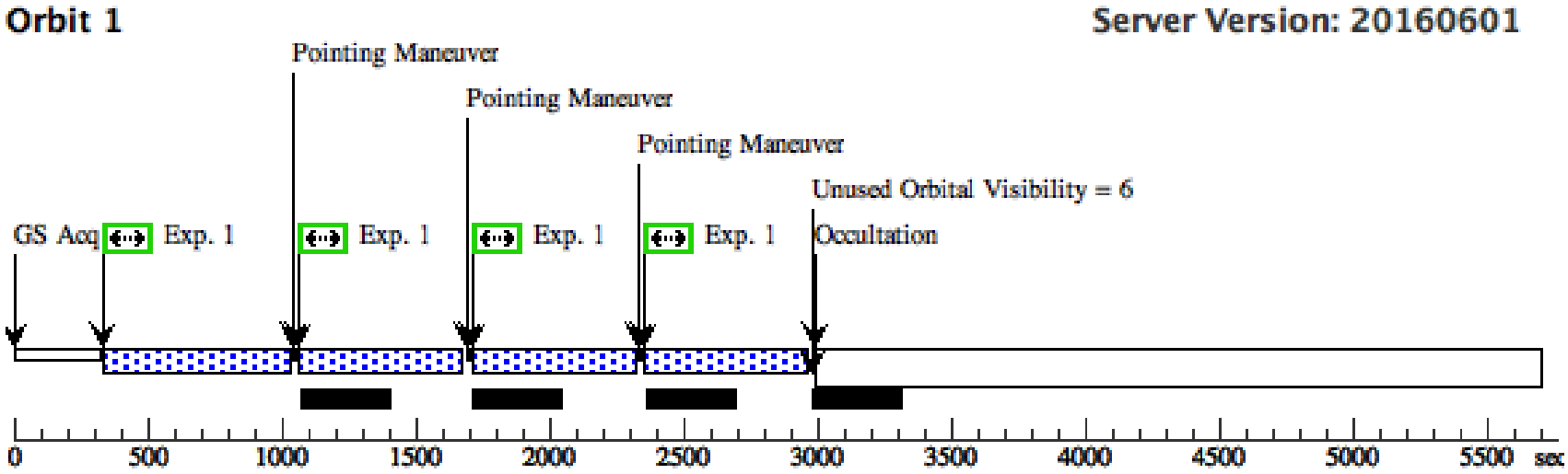
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SHORT-GRB	RA: 22 00 46.2144 (330.1925600d) Dec: +29 38 37.61 (29.64378d) Equinox: J2000		V=25.5	Reference Frame: XRT

Comments: Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACS	(1) SHORT-GRB	ACS/WFC, ACCUM, WFC	F606W			Pattern 1, Exps 1-1 in VISIT1 (01) (1)	490 Secs (1960 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 14357, VISIT1 (02), implementation Fri Jul 29 17:30:10 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; ON HOLD ; TOO RESPONSE TIME 3.0D

On Hold Comments: GRB trigger

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(1)

Fixed Targets

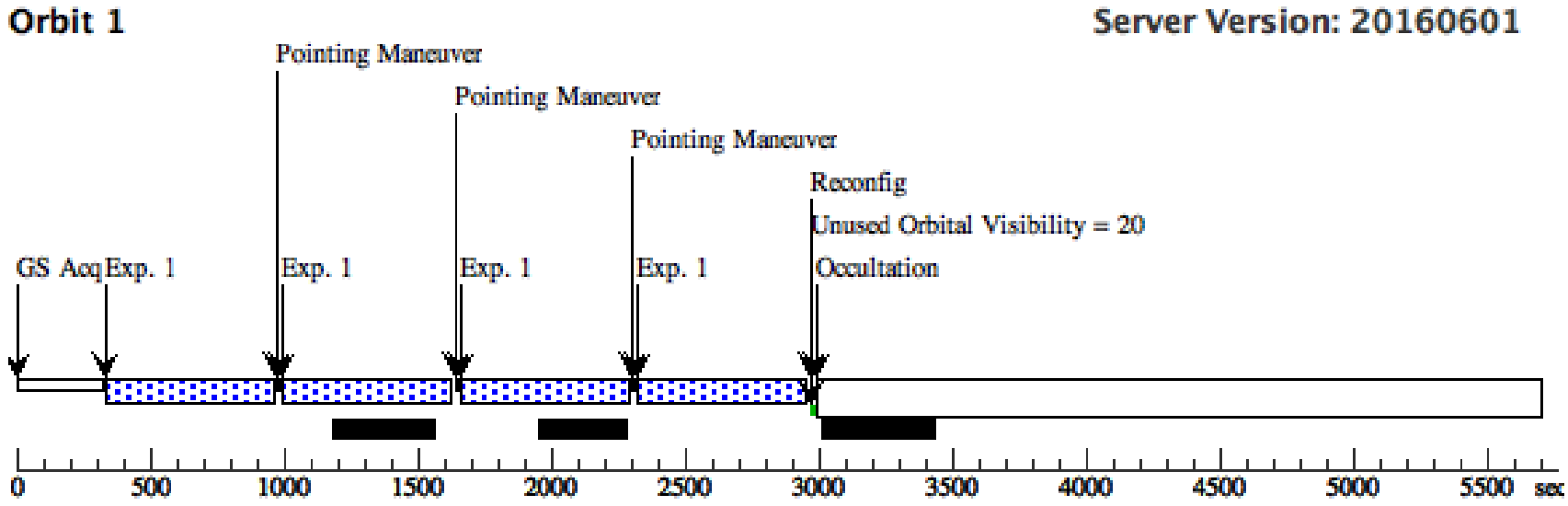
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SHORT-GRB	RA: 22 00 46.2144 (330.1925600d) Dec: +29 38 37.61 (29.64378d) Equinox: J2000		V=25.5	Reference Frame: XRT

Comments: Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	IR1	(1) SHORT-GRB	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=13; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in VISIT1 (02) (2)	602.937703 Secs (2411.751 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 14357, VISIT1 (03), implementation Fri Jul 29 17:30:10 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; ON HOLD ; TOO RESPONSE TIME 3.0D

On Hold Comments: GRB trigger

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(1)

Fixed Targets

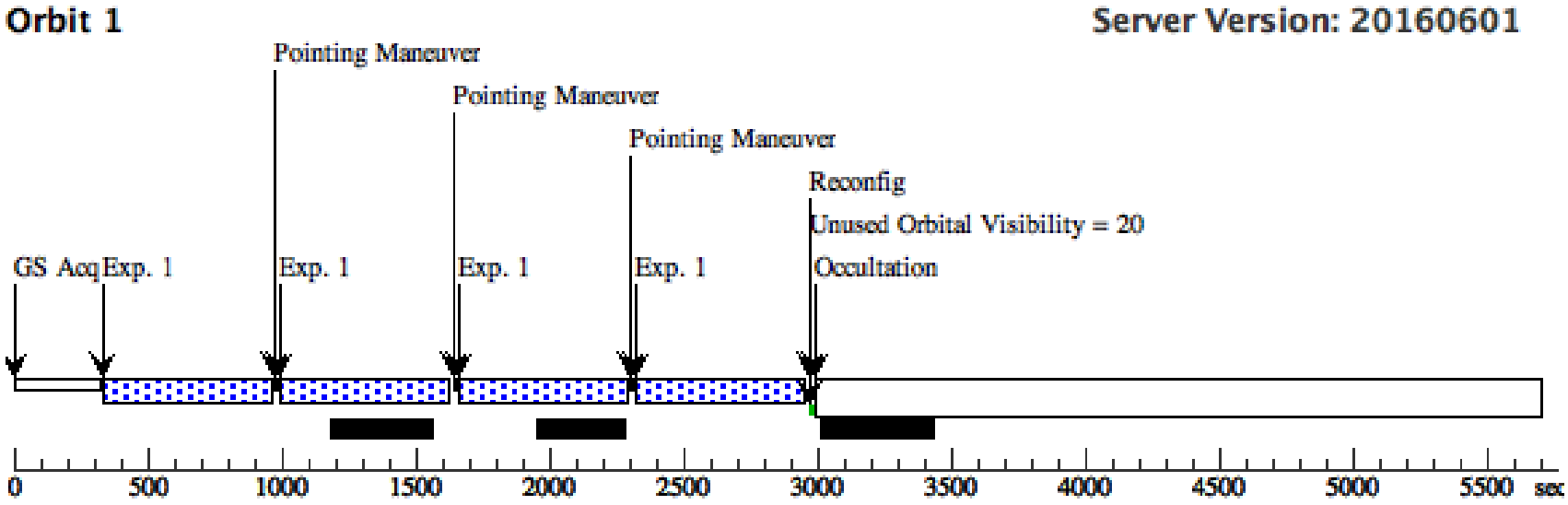
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SHORT-GRB	RA: 22 00 46.2144 (330.1925600d) Dec: +29 38 37.61 (29.64378d) Equinox: J2000		V=25.5	Reference Frame: XRT

Comments: Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	IR1	(1) SHORT-GRB	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=13; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in VISIT1 (03) (2)	602.937703 Secs (2411.751 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 14357, VISIT2 (04), implementation Fri Jul 29 17:30:10 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: SCHED 100%; AFTER 01 BY 4 D TO 6 D; ON HOLD ; TOO RESPONSE TIME 3.0D

On Hold Comments: GRB trigger

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1)

Fixed Targets

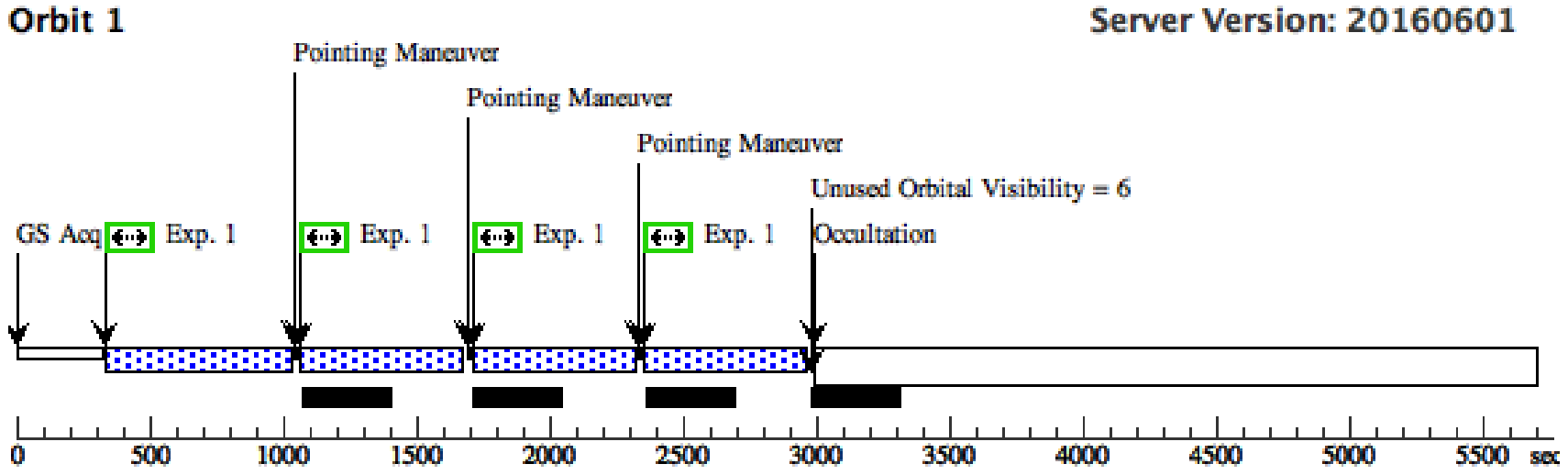
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SHORT-GRB	RA: 22 00 46.2144 (330.1925600d) Dec: +29 38 37.61 (29.64378d) Equinox: J2000		V=25.5	Reference Frame: XRT

Comments: Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACS	(1) SHORT-GRB	ACS/WFC, ACCUM, WFC	F606W			Pattern 1, Exps 1-1 in VISIT2 (04) (1)	490 Secs (1960 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 14357, VISIT2 (05), implementation Fri Jul 29 17:30:10 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; AFTER 02 BY 4 D TO 6 D; ON HOLD ; TOO RESPONSE TIME 3.0D

On Hold Comments: GRB trigger

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(1)

Fixed Targets

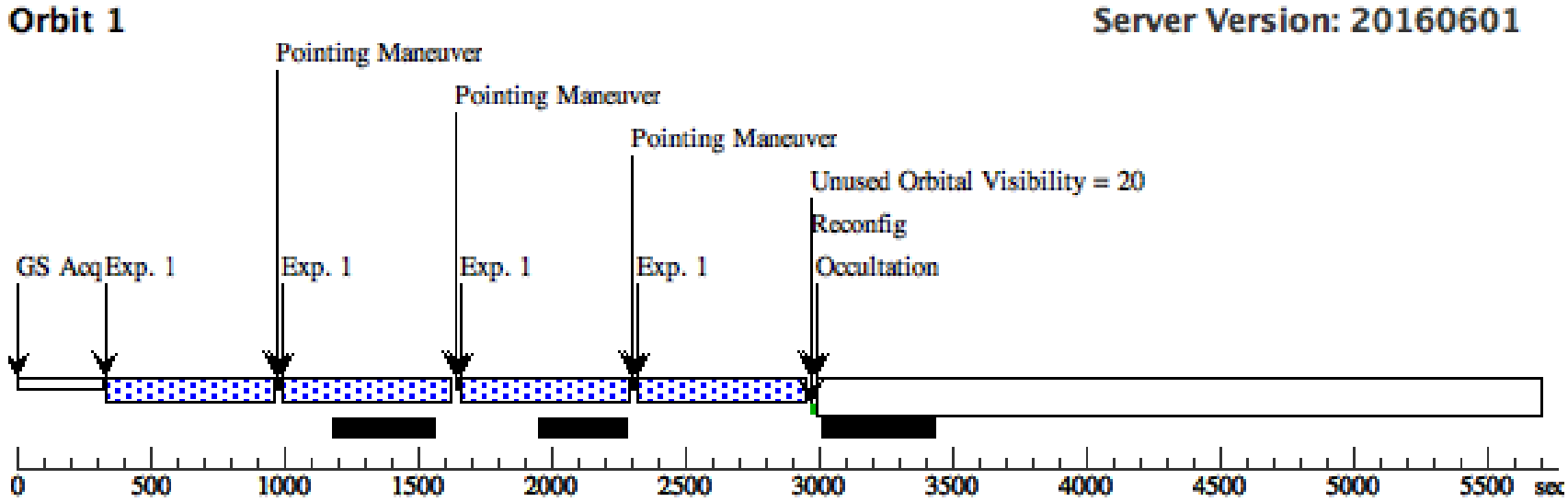
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SHORT-GRB	RA: 22 00 46.2144 (330.1925600d) Dec: +29 38 37.61 (29.64378d) Equinox: J2000		V=25.5	Reference Frame: XRT

Comments: Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	IR1	(1) SHORT-GRB	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=13; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in VISIT2 (05) (2)	602.937703 Secs (2411.751 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 14357, VISIT2 (06), implementation Fri Jul 29 17:30:10 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; AFTER 03 BY 4 D TO 6 D; ON HOLD ; TOO RESPONSE TIME 3.0D

On Hold Comments: GRB trigger

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SHORT-GRB	RA: 22 00 46.2144 (330.1925600d) Dec: +29 38 37.61 (29.64378d) Equinox: J2000		V=25.5	Reference Frame: XRT

Comments: Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	IR1	(1) SHORT-GRB	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=13; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in VISIT2 (06) (2)	602.937703 Secs (2411.751 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure