17805 - Ultra-rapid observations of a gravitational wave source

Cycle: 32, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
Dr. Eleonora Troja (PI) (ESA Member) (Contact)	**Universita degli Studi di Roma Tor Vergata**
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Josefa Becerra-Gonzalez (CoI) (ESA Member)	Instituto de Astrofisica de Canarias

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(3) AT2025ULZ	WFC3/UVIS	1	21-Aug-2025 18:00:14.0	yes
02	(3) AT2025ULZ	WFC3/IR	1	21-Aug-2025 18:00:15.0	yes
03	(3) AT2025ULZ	WFC3/IR	1	21-Aug-2025 18:00:16.0	yes
04	(3) AT2025ULZ	WFC3/IR	1	21-Aug-2025 18:00:16.0	yes
05	(3) AT2025ULZ	WFC3/IR	1	21-Aug-2025 18:00:17.0	yes

5 Total Orbits Used

ABSTRACT

The discovery of GW170817 ushered in a new era of multi-messenger astrophysics, in which gravitational waves and light are used to explore the most extreme phenomena, such as gamma-ray bursts and kilonovae. We propose to use the unique sensitivity and spectral UV coverage of HST to probe the earliest phases of a young kilonova, promptly (< 4 hr) localized through gravitational waves and light. A similar event, although rare, would offer us the unique opportunity to open a new window into the physics of kilonovae and probe an unexplored stage of their life. These observations would constrain the physical properties of the emitting ejecta (e.g. temperature, expansion velocity) and critically distinguish between competing models (e.g. radioactivity, shock interactions, magnetar) to power the luminous blue kilonova.

OBSERVING DESCRIPTION

For events at > 100 Mpc, we request 5 orbits of UV imaging (F336W, F275W, F225W) split in two visits, one (2 orbits) as soon as possible (IMA V1) and the second one (3 orbits) within 1 day (IMA V2) since V1.

For an event <100 Mpc, we would instead opt for spectroscopic observations using the WFC3/G280 grism and the same number of orbits.

Depending on the reaction time and information available at the time of the trigger, a hybrid configuration (spectroscopy followed by imaging) may be adopted.

Visit

Proposal 17805, VISIT (01) Thu Aug 21 22:00:17 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: TOO RESPONSE TIME 2.0D

Comments: Imaging, single filter F225W, 1 orbit

Recommended post-flash of 20 e/pixels
Aperture chosen to target near the C amplifier to reduce CTE losses
If you need to reduce the FOV, use UVIS2-C1K1C-SUB

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1)

Fixed Targets

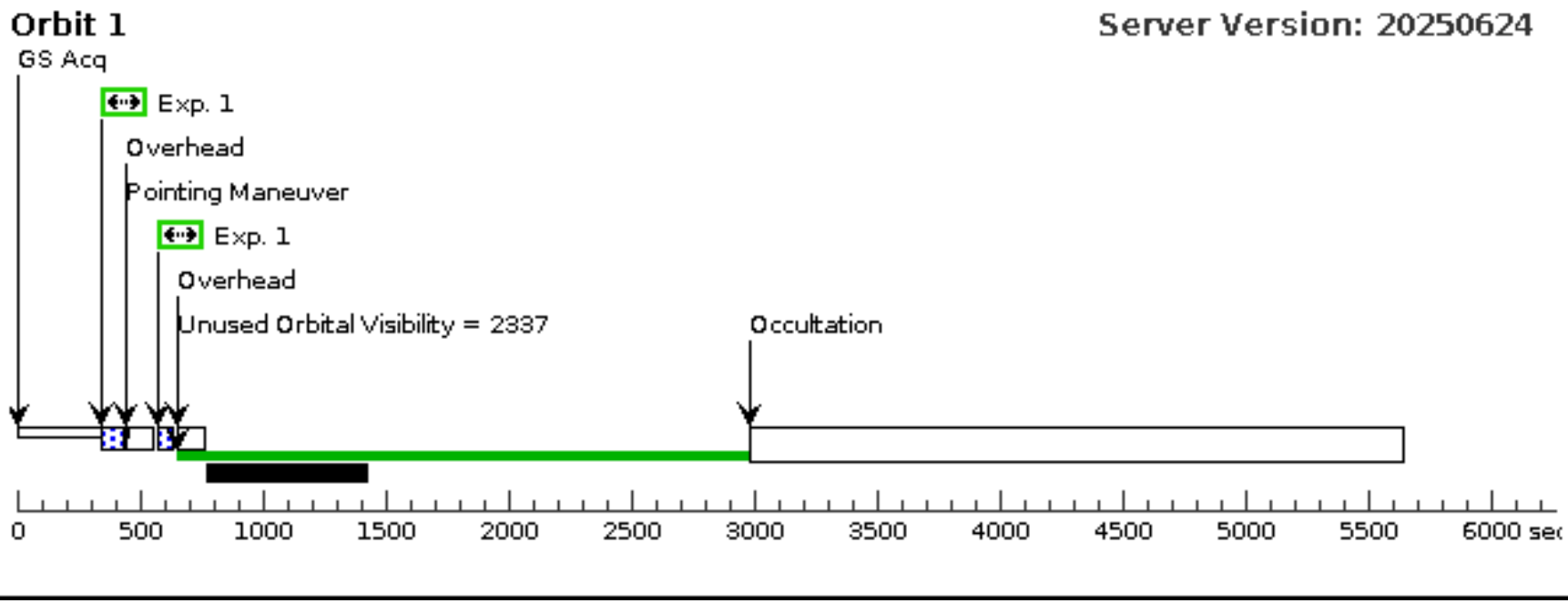
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	AT2025ULZ	RA: 15 51 54.1711 (237.9757129d) Dec: +30 54 8.33 (30.90231d) Equinox: J2000		V=28	Reference Frame: ZTF

Comments:
Category=STAR
Description=[EJECTA, NEUTRON STAR]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) AT2025ULZ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F336W	CR-SPLIT=NO; FLASH=19		Pattern 3, Exps 1-1 in VISIT (01) (3)	60 Secs (120 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[1]***

Orbit Structure



Visit

Proposal 17805, IRKN (02) Thu Aug 21 22:00:17 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; TOO RESPONSE TIME 2.0D

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(6)	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=1 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=5 Angle Between Sides= Center Pattern=false	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

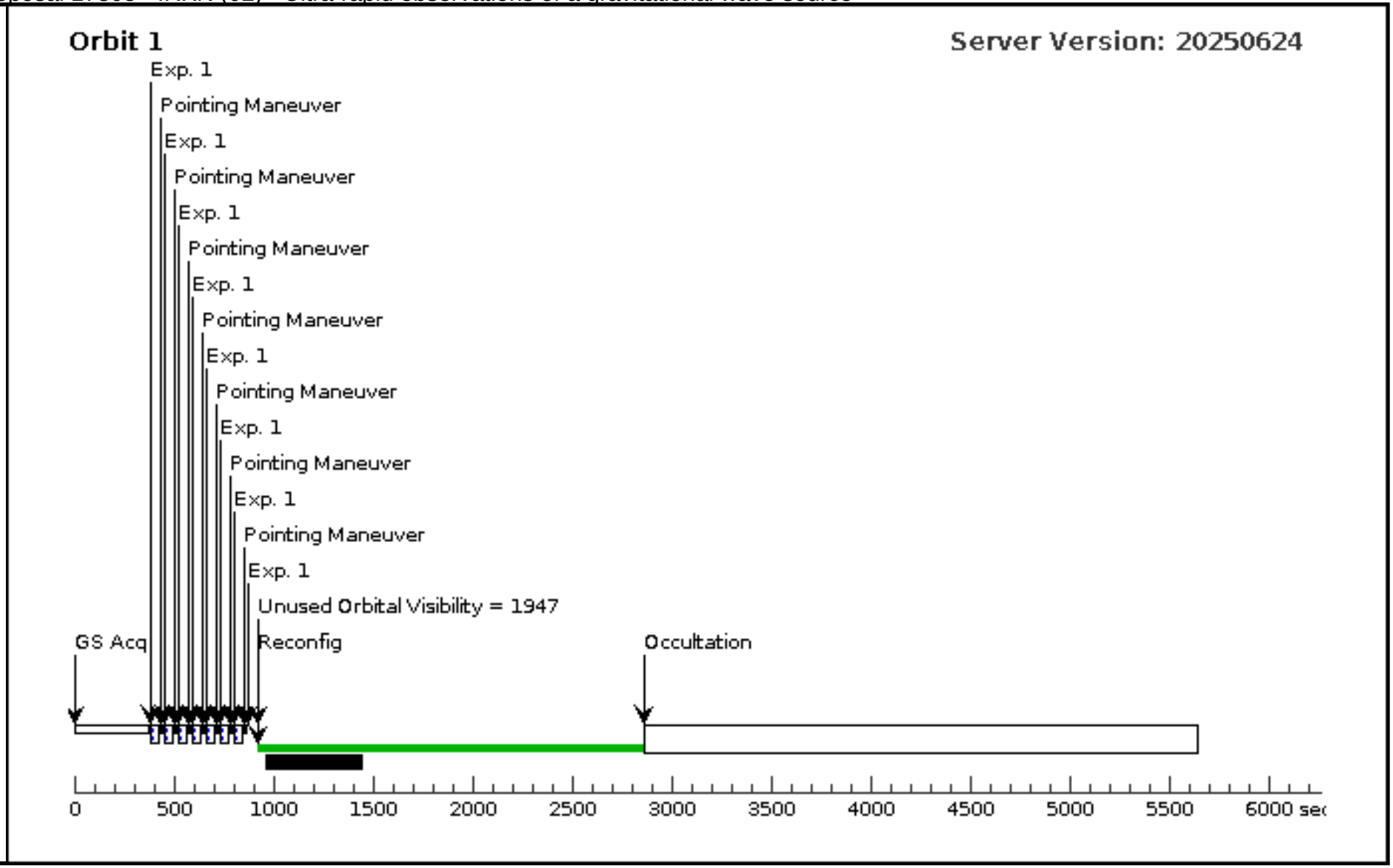
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	AT2025ULZ	RA: 15 51 54.1711 (237.9757129d) Dec: +30 54 8.33 (30.90231d) Equinox: J2000		V=28	Reference Frame: ZTF

Comments:
Category=STAR
Description=[EJECTA, NEUTRON STAR]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) AT2025ULZ	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=2; SAMP-SEQ=SPARS5		Pattern 6, Exps 1-1 in IRKN (02) (6)	7.933062 Secs (63.464 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 1,3)]* *[==>(Pattern 1,4)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]* *[==>(Pattern 2,3)]* *[==>(Pattern 2,4)]*	***[1]***

Orbit Structure



Visit

Proposal 17805, IRKN (03) Thu Aug 21 22:00:18 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; ON HOLD ; TOO RESPONSE TIME 2.0D

On Hold Comments: Awaiting GW trigger

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(6)	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=1 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=5 Angle Between Sides= Center Pattern=false	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

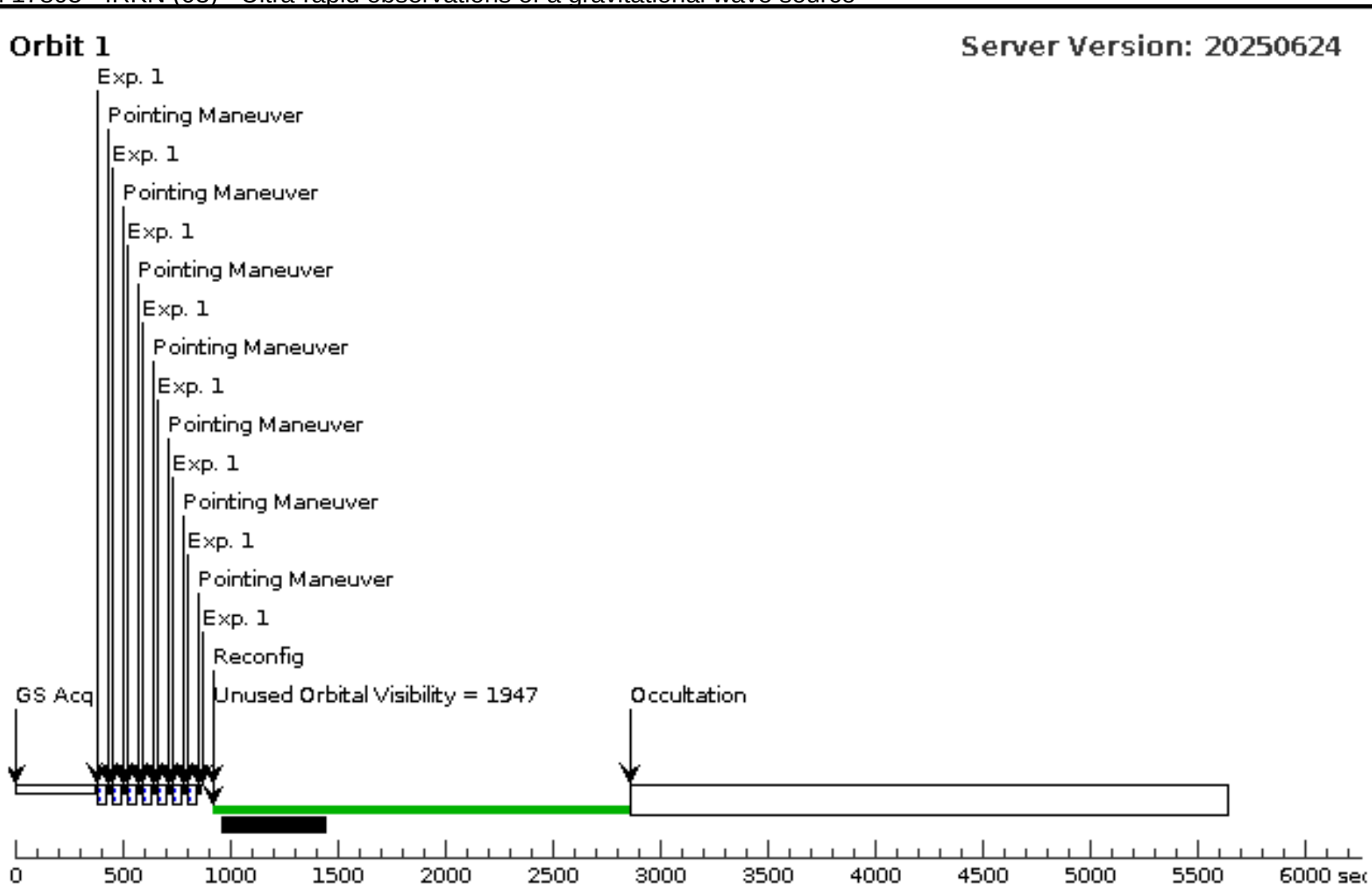
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	AT2025ULZ	RA: 15 51 54.1711 (237.9757129d) Dec: +30 54 8.33 (30.90231d) Equinox: J2000		V=28	Reference Frame: ZTF

Comments:
Category=STAR
Description=[EJECTA, NEUTRON STAR]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) AT2025ULZ	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=2; SAMP-SEQ=SPARS5		Pattern 6, Exps 1-1 in IRKN (03) (6)	7.933062 Secs (63.464 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 1,3)]* *[==>(Pattern 1,4)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]* *[==>(Pattern 2,3)]* *[==>(Pattern 2,4)]*	***[1]***

Orbit Structure



Visit

Proposal 17805, IRKN (04) Thu Aug 21 22:00:18 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; TOO RESPONSE TIME 2.0D

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(6)	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=1 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=5 Angle Between Sides= Center Pattern=false	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

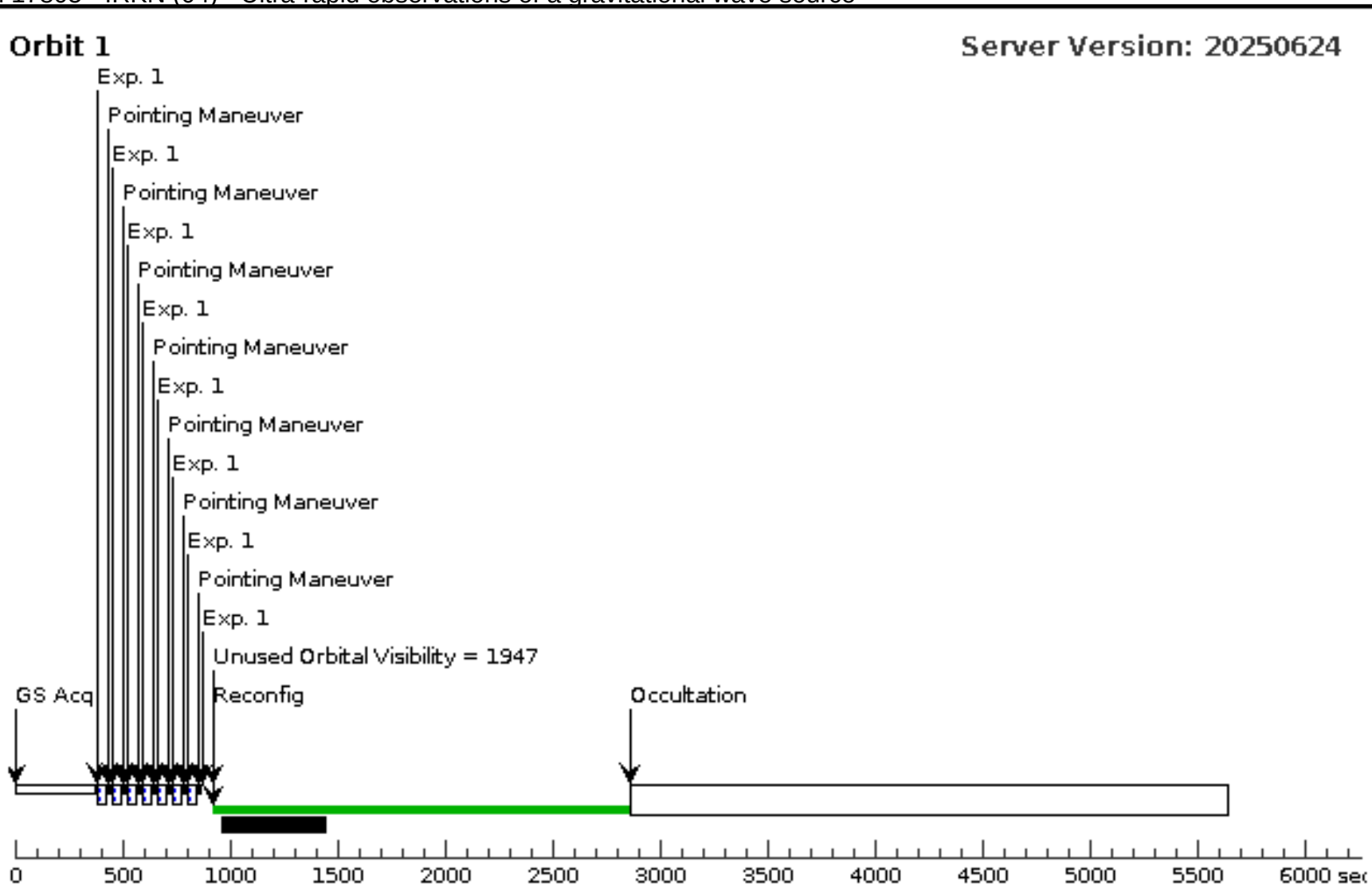
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	AT2025ULZ	RA: 15 51 54.1711 (237.9757129d) Dec: +30 54 8.33 (30.90231d) Equinox: J2000		V=28	Reference Frame: ZTF

Comments:
Category=STAR
Description=[EJECTA, NEUTRON STAR]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) AT2025ULZ	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=2; SAMP-SEQ=SPARS5		Pattern 6, Exps 1-1 in IRKN (04) (6)	7.933062 Secs (63.464 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 1,3)]* *[==>(Pattern 1,4)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]* *[==>(Pattern 2,3)]* *[==>(Pattern 2,4)]*	***[1]***

Orbit Structure



Visit

Proposal 17805, IRKN (05) Thu Aug 21 22:00:18 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; ON HOLD ; TOO RESPONSE TIME 2.0D

On Hold Comments: Awaiting GW trigger

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(6)	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=1 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=5 Angle Between Sides= Center Pattern=false	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
(3)	AT2025ULZ	RA: 15 51 54.1711 (237.9757129d) Dec: +30 54 8.33 (30.90231d) Equinox: J2000		V=28	Reference Frame: ZTF

Comments:
Category=STAR
Description=[EJECTA, NEUTRON STAR]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) AT2025ULZ	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=2; SAMP-SEQ=SPARS5		Pattern 6, Exps 1-1 in IRKN (05) (6)	7.933062 Secs (63.464 Secs) *[==>(Pattern 1,1)]* *[==>(Pattern 1,2)]* *[==>(Pattern 1,3)]* *[==>(Pattern 1,4)]* *[==>(Pattern 2,1)]* *[==>(Pattern 2,2)]* *[==>(Pattern 2,3)]* *[==>(Pattern 2,4)]*	***[1]***

Orbit Structure