17872 - JOINING JUNO'S LAST ORBITS: A MULTI-WAVELENGTH PERSPECTIVE

Cycle: 32, Proposal Category: GO

(UV Initiative)

(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?*
01	(1) JUPITER-NORTH-AURORA	STIS/FUV-MAMA	1	15-Aug-2025 15:01:05.0	yes
02	(2) JUPITER-NORTH-AURORA2	STIS/FUV-MAMA	1	15-Aug-2025 15:01:06.0	yes
03	(1) JUPITER-NORTH-AURORA	STIS/FUV-MAMA	1	15-Aug-2025 15:01:07.0	yes
04	(1) JUPITER-NORTH-AURORA	STIS/FUV-MAMA	1	15-Aug-2025 15:01:07.0	yes

4 Total Orbits Used

ABSTRACT

X-ray (<60 Angstrom) and UV (>700 Angstrom) observations by Chandra and HST have continuously revolutionised our understanding of Jupiter. In September 2021, the first ever EUV (60-170 Angstrom) observation of Jupiter was taken by the HRC-S thin filter, revealing an order of magnitude increase in counts compared to previous observations. A simultaneous HST observation mainly focused on Jupiter's disk emission. This campaign will conduct new EUV observations of Jupiter's auroral region coinciding with the final orbits of the Juno spacecraft's mission, supplemented by simultaneous HST observations optimised for auroral viewing. This is the final opportunity of this decade to unveil the physics of Jupiter's dynamic X-ray emission in concert with in situ exploration of Jupiter's magnetosphere.

OBSERVING DESCRIPTION

One HST/STIS FUV-MAMA CLEAR filter imaging observation over one science orbit will be taken during each of the Chandra HRC-S observations, with four observations in total. All observations will have 2.5 ks exposure time and be completed in TIMETAG mode, allowing for retrieval of temporal variability during reduction. These observations will provide simultaneous FUV imaging to be compared to the EUV Chandra observation.

During PJ 76 (2025-09-14), the Sun-HST-Jupiter angle will be 61 degrees, larger than the 50 degrees minimum acceptable for telescope pointing. This is also true for PJ69 and PJ70 (listed in Table 1). Optimal viewing is obtained with a pointing of 13" towards Jovian North from the centre of the planet as it appears on the sky; these sky coordinates can be determined from ephemerides once the date and time of the observation are known. Given Jupiter's apparent size (35") and the STIS FOV (25"), this will capture nearly the full northern aurorae, as well as low-latitude emission (for calibration against Chandra) and sky background (for calibration against geocoronal H). For these imaging observations, any roll angle is acceptable given reasonably accurate pointing (i.e., ~ 1" accuracy or better, which HST is fully capable of), and so the roll angle constraints due to the separation angle (i.e., +U3 limited to 15-30 off nominal) are acceptable.

Visit

Proposal 17872, JUPITER-NORTH-AURORA (01), implementation Fri Aug 15 19:01:08 GMT 2025

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: SCHED 100%; BETWEEN 2025.258:15:46:00 AND 2025.258:16:46:00

Diagnostics

(JUPITER-NORTH-AURORA (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(JUPITER-NORTH-AURORA (01.001)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(JUPITER-NORTH-AURORA (01)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	JUPITER-NORTH-AURORA	STD=JUPITER	TYPE=PGRAPHIC,LONG=170,LAT=65		NOT OCC OF JUPITER-NORTH-AURORA BY JUPITER FROM EARTH, CML OF JUPITER FROM EARTH BETWEEN 110 220	EARTH

Comments: Level 2 Planetographics reference to Jupiter System 3 (West)
Description=OFFSET JUPITER
Extended=YES

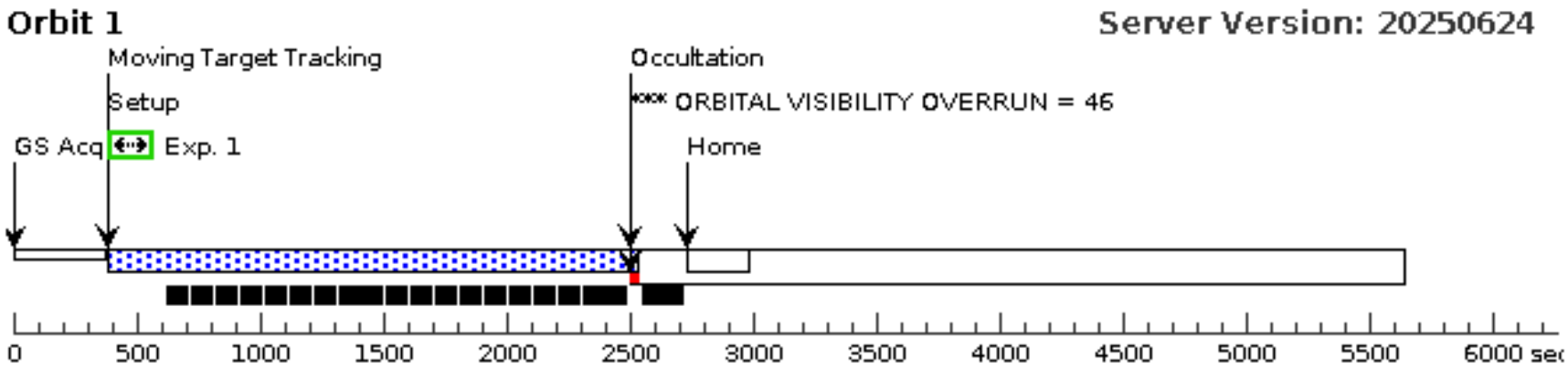
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	JUPITER-NORTH-AURORA	(1) JUPITER-NORTH-AURORA	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2400 Secs (1998 Secs) *[==>1998.0 Secs]*	 ***[1]***

Comments: ETC run not provided as similar filter/aperture observations have been conducted previously

This observation is to be co-ordinated with Chandra HRC observations of Jupiter, and exact dates will be confirmed at a later date.

Orbit Structure



Visit

Proposal 17872, JUPITER-NORTH-AURORA (02), implementation Fri Aug 15 19:01:08 GMT 2025

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: SCHED 100%; BETWEEN 2025.258:17:20:00 AND 2025.258:18:20:00

Diagnostics

(JUPITER-NORTH-AURORA (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(JUPITER-NORTH-AURORA (02.001)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(JUPITER-NORTH-AURORA (02)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	JUPITER-NORTH-AURORA2	STD=JUPITER	TYPE=PGRAPHIC,LONG=170,LAT=65		NOT OCC OF JUPITER-NORTH-AURORA2 BY JUPITER FROM EARTH, CML OF JUPITER FROM EARTH BETWEEN 110 240	EARTH

Comments: Level 2 Planetographics reference to Jupiter System 3 (West)
Target for visit 2. CML ranged opened to 110 to 240 degrees.
Description=OFFSET JUPITER
Extended=YES

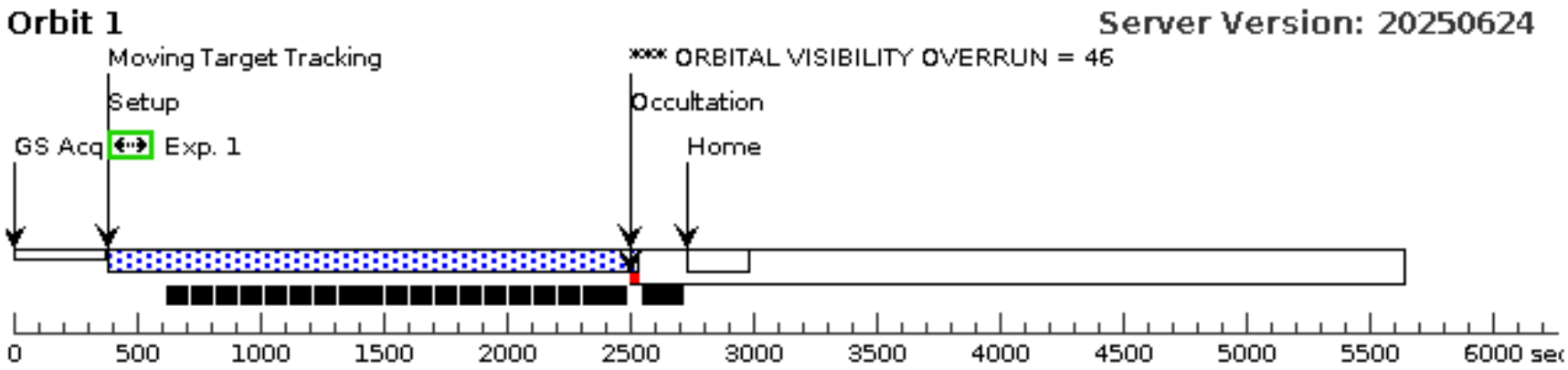
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	JUPITER-NORTH-AURORA	(2) JUPITER-NORTH-AURORA2	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2400 Secs (1998 Secs) *[==>1998.0 Secs]*	 ***[1]***

Comments: ETC run not provided as similar filter/aperture observations have been conducted previously

This observation is to be co-ordinated with Chandra HRC observations of Jupiter, and exact dates will be confirmed at a later date.

Orbit Structure



Visit

Proposal 17872, JUPITER-NORTH-AURORA (03), implementation Fri Aug 15 19:01:08 GMT 2025

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: SCHED 100%; BETWEEN 2025.257:19:21:00 AND 2025.257:20:21:00

Diagnostics

(JUPITER-NORTH-AURORA (03.001)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(JUPITER-NORTH-AURORA (03)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	JUPITER-NORTH-AURORA	STD=JUPITER	TYPE=PGRAPHIC,LONG=170,LAT=65		NOT OCC OF JUPITER-NORTH-AURORA BY JUPITER FROM EARTH, CML OF JUPITER FROM EARTH BETWEEN 110 220	EARTH

Comments: Level 2 Planetographics reference to Jupiter System 3 (West)
Description=OFFSET JUPITER
Extended=YES

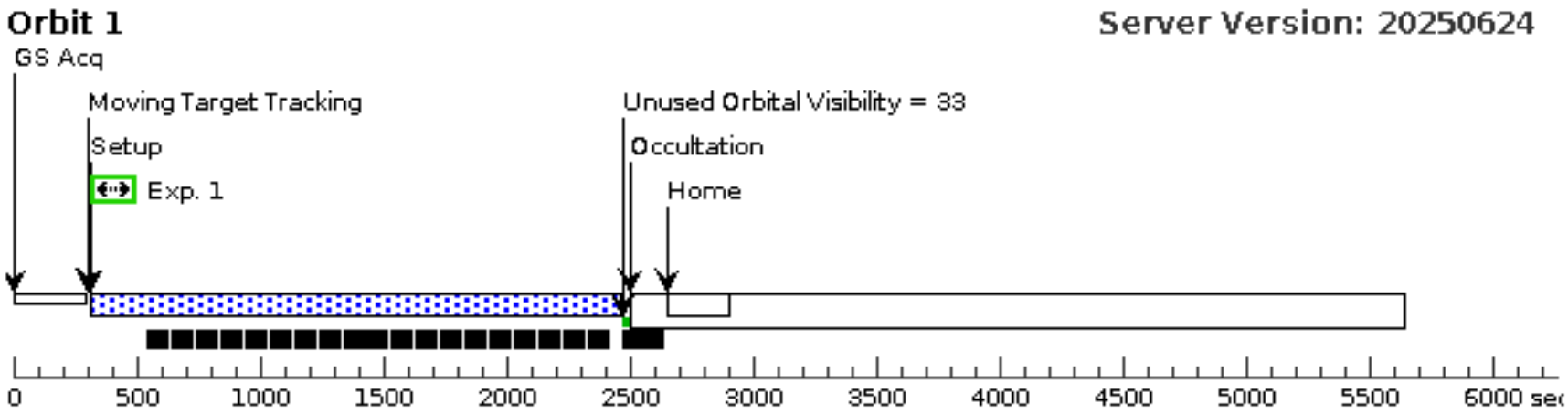
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	JUPITER-NORTH-AURORA	(1) JUPITER-NORTH-AURORA	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99	GS ACQ SCENARIO ONEB1OR		2400 Secs (1998 Secs) *[==>1998.0 Secs]*	*[1]*

Comments: ETC run not provided as similar filter/aperture observations have been conducted previously

This observation is to be co-ordinated with Chandra HRC observations of Jupiter, and exact dates will be confirmed at a later date.

Orbit Structure



Visit

Proposal 17872, JUPITER-NORTH-AURORA (04), implementation Fri Aug 15 19:01:08 GMT 2025

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: SCHED 100%; BETWEEN 2025.257:20:56:00 AND 2025.257:21:56:00

Diagnostics

(JUPITER-NORTH-AURORA (04.001)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(JUPITER-NORTH-AURORA (04)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	JUPITER-NORTH-AURORA	STD=JUPITER	TYPE=PGRAPHIC,LONG=170,LAT=65		NOT OCC OF JUPITER-NORTH-AURORA BY JUPITER FROM EARTH, CML OF JUPITER FROM EARTH BETWEEN 110 220	EARTH

Comments: Level 2 Planetographics reference to Jupiter System 3 (West)
Description=OFFSET JUPITER
Extended=YES

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	JUPITER-NORTH-AURORA	(1) JUPITER-NORTH-AURORA	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99	GS ACQ SCENARIO ONEB1OR		2400 Secs (1998 Secs) *[==>1998.0 Secs]*	*[1]*

Comments: ETC run not provided as similar filter/aperture observations have been conducted previously

This observation is to be co-ordinated with Chandra HRC observations of Jupiter, and exact dates will be confirmed at a later date.

Orbit Structure