



16989 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Cycle: 30, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

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Prof. Robert Lysak (CoI)	University of Minnesota - Twin Cities

VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
19	(1) JUPITER-AURORA-JUNOEM-19	STIS/FUV-MAMA	1	23-Aug-2024 10:00:22.0	yes
20	(2) JUPITER-AURORA-JUNOEM-20	STIS/FUV-MAMA	1	23-Aug-2024 10:00:23.0	yes
21	(3) JUPITER-AURORA-JUNOEM-21	STIS/FUV-MAMA	1	23-Aug-2024 10:00:24.0	yes
22	(4) JUPITER-AURORA-JUNOEM-22	STIS/FUV-MAMA	1	23-Aug-2024 10:00:25.0	yes

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
23	(5) JUPITER-AURORA-JUNOEM-23	STIS/FUV-MAMA	1	23-Aug-2024 10:00:26.0	yes
24	(6) JUPITER-AURORA-JUNOEM-24	STIS/FUV-MAMA	1	23-Aug-2024 10:00:26.0	yes
25	(7) JUPITER-AURORA-JUNOEM-25	STIS/FUV-MAMA	1	23-Aug-2024 10:00:27.0	yes
26	(8) JUPITER-AURORA-JUNOEM-26	STIS/FUV-MAMA	1	23-Aug-2024 10:00:27.0	yes
27	(9) JUPITER-AURORA-JUNOEM-27	STIS/FUV-MAMA	1	23-Aug-2024 10:00:28.0	yes
28	(10) JUPITER-AURORA-JUNOEM-28	STIS/FUV-MAMA	1	23-Aug-2024 10:00:29.0	yes
29	(11) JUPITER-AURORA-JUNOEM-29	STIS/FUV-MAMA	1	23-Aug-2024 10:00:29.0	yes
30	(12) JUPITER-AURORA-JUNOEM-30	STIS/FUV-MAMA	1	23-Aug-2024 10:00:30.0	yes

12 Total Orbits Used

ABSTRACT

In September 2021, the highly successful NASA Juno spacecraft will begin its Extended Mission (EM). During the EM, Juno will cross the equatorial region inside of Ganymede's orbit providing an opportunity to obtain HST auroral images simultaneously with high-resolution in situ observations in the crucial inner equatorial region of Jupiter's magnetosphere, where the key dynamics that drive and shape the magnetosphere originate. The STIS/FUV imaging observations proposed here over Cycles 29-31 will answer a large number of outstanding scientific questions, including:

- * Do magnetosphere-ionosphere coupling currents drive Jupiter's main auroral emission?
- * What radial forces govern the structure of Jupiter's magnetosphere?
- * What is the nature of the interaction between Jupiter and its satellites?
- * How do Jovian plasma populations relate to low latitude auroral emissions?
- * How does magnetospheric wave activity influence Jupiter's magnetosphere?
- * What processes give rise to pulsating high-latitude emissions?

This program responds to the UV initiative and is only possible during the Juno EM. These observations cannot be made by Juno UVS and HST is the only observatory capable of making these FUV observations, which will yield high-impact results, and complement and extend the goals of the NASA Juno mission.

OBSERVING DESCRIPTION

The timescale of the observations required to address the science goals is governed by the orbit of Juno in the EM and covers HST Cycles 29-31; hence our proposal is for a Long Term program of observations. The EM begins in July 2021 and is scheduled nominally to last until August 2025. The availability of Jupiter from HST during Cycles 29-31 is 1 Oct 2021 - 25 Dec 2021; 18 May 2022 - 31 Jan 23; 25 Jun 2023 - 7 March 2024; and 2 Aug 2024 - 30 Sept 2024, where the last date is the assumed end of Cycle 31. Our observations will be clustered around the perijoves, when Juno is in the critical regions of the magnetosphere as described above. Orbit requests are 18 (Cycle 29), 12 (Cycle 30) and 10 (Cycle 31). The orbit request is governed as follows: the science lies in the temporal domain, i.e. variations in the auroral morphology are compared with changes in the in situ field and plasma observations. It is critical that such variation is captured in order to correlate the multiple data sets, and to determine the response to dynamical processes such as solar wind compression events and changing mass loading rates. We hence will use multiple observations for each science goal to capture the key variability that reveals the dynamics of the system. The timescales are: there are typically two ~ 3 - day solar wind compressions per solar rotation (25 days), so the duty cycle for "disturbed" conditions is around 1/4. Thus observing 8 epochs will yield ~ 2 disturbed intervals, the minimum required to establish repeatable effects. Changes typically take place over a few days. We hence will observe for 2-4 orbits per interval to determine the short-timescale dynamics and to cover both north and south auroras in order to capture the important physics along the entire flux tube. The exact numbers for each interval have been determined by examination of the number of favourable viewing windows for each of the science goals during the 2-3-day intervals surrounding each perijove. We note that there are ~ 5 SAA-free orbits per day, such that it is possible to observe at least once per day, as has been done successfully previously. For the flybys we will observe as close as possible to the events within the limits of the SAA. These observations will be obtained using the STIS/FUV-MAMA instrument. Auroral images will be obtained using the F25SRF2 filter, in order to observe the H2 Lyman and Werner emission whilst removing contamination from the geocoronal Lyman-alpha. We will observe both northern and southern auroras; the priority will be observing whilst Juno is in the critical regions, rather than focusing on one hemisphere. Jupiter will be positioned using POS_ANGLE (i.e. RAD and ANG) such that only the auroral region and nearby disc will be in the 25x25" field of view, and thus $< 1/4$ of the detector is filled with the planet. This limits the count rates to $\sim 20,000$ counts/s, well within the limit of 200,000 counts/s. Observations will be taken in ~ 3000 s time-tagged exposures, from which images integrated over smaller intervals (e.g. 10-100 s) will be extracted. This setup has been successfully used to observe Jupiter's auroras previously. In the event of STIS not being available, these observations will be

Proposal 16989 (STScI Edit Number: 20, Created: Friday, August 23, 2024, 9:00:31AM Eastern Standard Time) - Overview

obtained with the Solar Blind Channel of the Advanced Camera for Surveys, which in practice yields lower signal to noise than STIS owing to its red leak. In the past, Jupiter observations have been successfully obtained in both 2-gyro and 3-gyro mode. In 2-gyro mode we would remove any roll constraints and we would request our orbit during the interval when Jupiter is available.

Proposal 16989 - Visit 19 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Visit	Proposal 16989, Visit 19, completed Fri Aug 23 14:00:31 GMT 2024					
	Diagnostic Status: Warning Scientific Instruments: STIS/FUV-MAMA Special Requirements: BETWEEN 06-NOV-2022:05:00:00 AND 06-NOV-2022:06:00:00; VISIBILITY INTERVAL NO GYRO BIAS UPDATE ON MOVING TARGET Comments: Inbound middle magnetosphere, south. We haven't specified an ORIENT range, since we can set RAD and ANG appropriately for any available ORIENT, but as outlined in Phase 1, ORIENT would ideally be as close to 60 as possible to put the disc in the corner of the FOV.					
Diagnostics	(Visit 19) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Exposure 1 (Visit 19)) Warning (Form): Sensitive exposures should have an ETC run number provided. (Visit 19) Informational (Form): The Visit Planner and Spike may produce different schedulability results.					
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Ephem Center
	(1)	JUPITER-AURORA-JUNOEM-19	STD=JUPITER	TYPE=POS_ANGLE,RAD=23,ANG=155,REF=NORTH		NOT CML OF JUPITER FROM EARTH BETWEEN 100 310
	Comments: This target is nominally for imaging Jupiter's southern auroras. Observation criteria are, in order of priority: Time window Avoidance of repeller wire and blotch region For this and all other imaging targets here, the values of RAD and ANG that will centre the auroral region in the relevant half of the detector, away from the repeller wire if possible, will depend in principle on ORIENT (although this is specified in the visit) and the CML range of the observations. We will work with the PC to update these once the orbit of HST is known. If the south is not visible during the SAA free orbits on a given day, we will observe the north or move the visit to a different time window. For the north, the values of ANG will be essentially these plus 180 degrees (with minor adjustments to avoid the repeller wire), and the CML range would be 120-220 deg. Description=PLANET JUPITER Extended=YES					
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.
	1	(1) JUPITER-AURO RA-JUNOEM-19	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99	
						Exp. Time (Total)/[Actual Dur.]
						2574 Secs (2574 Secs) [==>]
						Orbit
						[1]
Orbit Structure	Orbit 1 Server Version: 20240604					

Proposal 16989 - Visit 20 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Visit	Proposal 16989, Visit 20, completed Fri Aug 23 14:00:31 GMT 2024					
	Diagnostic Status: Warning Scientific Instruments: STIS/FUV-MAMA Special Requirements: BETWEEN 05-NOV-2022:22:35:00 AND 05-NOV-2022:23:45:00; VISIBILITY INTERVAL NO GYRO BIAS UPDATE ON MOVING TARGET <i>Comments: This visit is to cover the inner-middle magnetosphere. North.</i>					
Diagnostics	(Visit 20) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Exposure 1 (Visit 20)) Warning (Form): Sensitive exposures should have an ETC run number provided. (Visit 20) Informational (Form): The Visit Planner and Spike may produce different schedulability results.					
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Ephem Center
	(2)	JUPITER-AURORA-JUNOEM-20	STD=JUPITER	TYPE=POS_ANGLE,RAD=24,ANG=340,REF=NORTH		CML OF JUPITER FROM EARTH EARTH BETWEEN 120 220
	<i>Comments: This target is for imaging Jupiter's northern auroras. The values of RAD and ANG are dependent on ORIENT and the date and time of the observations. We will work with our PC to update these once the orbit of HST is known. For the south, the values of ANG would be essentially these plus 180 degrees (with minor adjustments to avoid the repeller wire), and the CML range would be 310-100 deg.</i> Description=PLANET JUPITER Extended=YES					
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.
	1		(2) JUPITER-AURO RA-JUNOEM-20	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99
						Exp. Time (Total)/[Actual Dur.]
						2574 Secs (2574 Secs) [==>]
						Orbit
						[1]
Orbit Structure	Orbit 1 Server Version: 20240604					

Proposal 16989 - Visit 21 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Visit	Proposal 16989, Visit 21, completed Fri Aug 23 14:00:31 GMT 2024					
	Diagnostic Status: Warning Scientific Instruments: STIS/FUV-MAMA Special Requirements: SCHED 40%; BETWEEN 07-NOV-2022:00:00:00 AND 07-NOV-2022:01:00:00; VISIBILITY INTERVAL NO GYRO BIAS UPDATE ON MOVING TARGET <i>Comments: High latitude outbound, south.</i>					
Diagnostics	(Visit 21) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Exposure 1 (Visit 21)) Warning (Form): Sensitive exposures should have an ETC run number provided. (Visit 21) Informational (Form): The Visit Planner and Spike may produce different schedulability results.					
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Ephem Center
	(3)	JUPITER-AURORA-JUNOEM-21	STD=JUPITER	TYPE=POS_ANGLE,RAD=23.0,ANG=152,REF=NORTH		NOT CML OF JUPITER FROM EARTH BETWEEN 100 310
	<i>Comments: This target is for imaging Jupiter's southern auroras. The values of RAD and ANG are dependent on ORIENT and the date and time of the observations. We will work with our PC to update these once the orbit of HST is known. For the north, the values of ANG would be essentially these plus 180 degrees (with minor adjustments to avoid the repeller wire), and the CML range would be 120-220 deg.</i> Description=PLANET JUPITER Extended=YES					
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.
	1		(3) JUPITER-AURO RA-JUNOEM-21	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99
						Exp. Time (Total)/[Actual Dur.]
						2523 Secs (2523 Secs) [==>]
						Orbit
						[1]
Orbit Structure	Orbit 1 Server Version: 20240604					

Proposal 16989 - Visit 22 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Fri Aug 23 14:00:31 GMT 2024

Visit	Proposal 16989, Visit 22, completed																																						
	Diagnostic Status: Warning																																						
Diagnostics	Scientific Instruments: STIS/FUV-MAMA																																						
	Special Requirements: SCHED 40%; BETWEEN 14-DEC-2022:08:40:00 AND 14-DEC-2022:09:40:00; VISIBILITY INTERVAL NO GYRO BIAS UPDATE ON MOVING TARGET																																						
Solar System Targets	Comments: This visit is to observe the northern auroras while Juno is inbound in the middle magnetosphere																																						
	(Visit 22) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN																																						
Exposures	(Exposure 1 (Visit 22)) Warning (Form): Sensitive exposures should have an ETC run number provided.																																						
	(Visit 22) Informational (Form): The Visit Planner and Spike may produce different schedulability results.																																						
Exposures	<table><thead><tr><th>#</th><th>Name</th><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Window</th><th>Ephem Center</th></tr></thead><tbody><tr><td>(4)</td><td>JUPITER-AURORA-JUNOEM-22</td><td>STD=JUPITER</td><td>TYPE=POS_ANGLE,RAD=23,ANG=348,REF=NORTH</td><td></td><td>CML OF JUPITER FROM EARTH BETWEEN 120 220</td><td>EARTH</td></tr></tbody></table>										#	Name	Level 1	Level 2	Level 3	Window	Ephem Center	(4)	JUPITER-AURORA-JUNOEM-22	STD=JUPITER	TYPE=POS_ANGLE,RAD=23,ANG=348,REF=NORTH		CML OF JUPITER FROM EARTH BETWEEN 120 220	EARTH															
	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center																																
(4)	JUPITER-AURORA-JUNOEM-22	STD=JUPITER	TYPE=POS_ANGLE,RAD=23,ANG=348,REF=NORTH		CML OF JUPITER FROM EARTH BETWEEN 120 220	EARTH																																	
Exposures	Comments: This target is for imaging Jupiter's northern auroras. The values of RAD and ANG are dependent on ORIENT and the date and time of the observations. We will work with our PC to update these once the orbit of HST is known. For the south, the values of ANG would be essentially these plus 180 degrees (with minor adjustments to avoid the repeller wire), and the CML range would be 120-220 deg.																																						
	Description=PLANET JUPITER																																						
Exposures	Extended=YES																																						
	<table><thead><tr><th>#</th><th>Label</th><th>Target</th><th>Config,Mode,Aperture</th><th>Spectral Els.</th><th>Opt. Params.</th><th>Special Reqs.</th><th>Groups</th><th>Exp. Time (Total)/[Actual Dur.]</th><th>Orbit</th></tr></thead><tbody><tr><td>1</td><td></td><td>(4) JUPITER-AURO RA-JUNOEM-22</td><td>STIS/FUV-MAMA, TIME-TAG, F25SRF2</td><td>MIRROR</td><td>BUFFER-TIME=99</td><td></td><td></td><td>2523 Secs (2523 Secs)</td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>[==>]</td><td>[1]</td></tr></tbody></table>										#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	1		(4) JUPITER-AURO RA-JUNOEM-22	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2523 Secs (2523 Secs)										[==>]
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit																														
1		(4) JUPITER-AURO RA-JUNOEM-22	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2523 Secs (2523 Secs)																															
								[==>]	[1]																														
Orbit Structure	Orbit 1 Server Version: 20240604 Moving Target Tracking Setup GS Acq Exp. 1 Occultation Home ORBITAL VISIBILITY OVERRUN = 5																																						

Proposal 16989 - Visit 23 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Visit	Proposal 16989, Visit 23, completed										Fri Aug 23 14:00:31 GMT 2024
	Diagnostic Status: Warning										
Diagnostics	Scientific Instruments: STIS/FUV-MAMA										
	Special Requirements: SCHED 40%; BETWEEN 15-DEC-2022:02:10:00 AND 15-DEC-2022:03:10:00										
	Comments: Io flyby, southern aurora. Priority is the southern aurora window near the flux tube crossing near 00h on 15 Dec. If not available due to the SAA, the later we will switch to high latitude south in the following rotation or expand the time interval by a day either side.										
Solar System Targets	(Visit 23) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN										
	(Exposure 1 (Visit 23)) Warning (Form): Sensitive exposures should have an ETC run number provided.										
	(Visit 23) Informational (Form): The Visit Planner and Spike may produce different schedulability results.										
Exposures	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center				
	(5)	JUPITER-AURORA-JUNOEM-23	STD=JUPITER	TYPE=POS_ANGLE,RAD=23.0,ANG=154,REF=NORTH		NOT CML OF JUPITER FROM EARTH BETWEEN 100 310	EARTH				
	Comments: This target is for imaging Jupiter's southern auroras. The values of RAD and ANG are dependent on ORIENT and the date and time of the observations. We will work with our PC to update these once the orbit of HST is known. For the south, the values of ANG would be essentially these plus 180 degrees (with minor adjustments to avoid the repeller wire), and the CML range would be 310-100 deg. Description=PLANET JUPITER Extended=YES										
Orbit Structure	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1		(5) JUPITER-AURO RA-JUNOEM-23	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2163 Secs (2163 Secs)		
									[=>]	[1]	
Orbit Structure	Orbit 1										
	Server Version: 20240604										
Orbit Structure	Moving Target Tracking										
	Exp. 1										
Orbit Structure	GS Acq Setup										
	Occultation										
Orbit Structure	Home										
	ORBITAL VISIBILITY OVERRUN = 5										
Orbit Structure	0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 sec										

Proposal 16989 - Visit 24 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Visit	Proposal 16989, Visit 24, completed										Fri Aug 23 14:00:31 GMT 2024
	Diagnostic Status: Warning										
Diagnostics	Scientific Instruments: STIS/FUV-MAMA										
	Special Requirements: SCHED 40%; BETWEEN 15-DEC-2022:05:20:00 AND 15-DEC-2022:06:20:00										
	Comments: North, inbound if possible prior to Io flyby in the window beginning ~19h on 14 Dec, otherwise Io flux tube following PJ in the window beginning ~05 h on 15 Dec (depending on SAA and visit 22 availability was)										
Solar System Targets	(Visit 24) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN										
	(Exposure 1 (Visit 24)) Warning (Form): Sensitive exposures should have an ETC run number provided.										
Exposures	(Visit 24) 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				
	(6)	JUPITER-AURORA-JUNOEM-24	STD=JUPITER	TYPE=POS_ANGLE,RAD=23,ANG=340,REF=NORTH		CML OF JUPITER FROM EARTH BETWEEN 120 220	EARTH				
Exposures	Comments: This target is for imaging Jupiter's northern auroras. The values of RAD and ANG are dependent on ORIENT and the date and time of the observations. We will work with our PC to update these once the orbit of HST is known. For the south, the values of ANG would be essentially these plus 180 degrees (with minor adjustments to avoid the repeller wire), and the CML range would be 310-100 deg.										
	Description=PLANET JUPITER										
Exposures	Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1		(6) JUPITER-AURO RA-JUNOEM-24	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2163 Secs (2163 Secs)		
Orbit Structure	[>=>]										
	[1]										
Orbit Structure	Orbit 1										
	Server Version: 20240604										
Orbit Structure	Moving Target Tracking										
	Exp. 1										
Orbit Structure	GS Acq Setup										
	Occultation										
Orbit Structure	Home										
	*** ORBITAL VISIBILITY OVERRUN = 5										
Orbit Structure	Orbit Structure Diagram										
	Timeline from 0 to 6000 seconds showing various phases and events.										

Proposal 16989 - Visit 25 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Visit	Proposal 16989, Visit 25, completed										Fri Aug 23 14:00:31 GMT 2024				
	Diagnostic Status: Warning														
Scientific Instruments: STIS/FUV-MAMA															
Special Requirements: SCHED 40%; BETWEEN 14-OCT-2023:18:36:00 AND 14-OCT-2023:19:36:00															
Comments: North, middle magnetosphere inbound.															
Diagnostics	(Visit 25) Warning (Orbit Planner): GS ACQ SCENARIO REQUESTED INCONSISTENT WITH VISIT GYRO MODE														
	(Exposure 1 (Visit 25)) Warning (Form): Sensitive exposures should have an ETC run number provided.														
	(Exposure 1 (Visit 25) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.														
	(Visit 25) 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								
	(7)	JUPITER-AURORA-JUNOEM-25	STD=JUPITER	TYPE=POS_ANGLE,RAD=26,ANG=355,REF=NORTH		CML OF JUPITER FROM EARTH BETWEEN 120 220	EARTH								
Comments: This target is for imaging Jupiter's northern auroras. The values of RAD and ANG are dependent on ORIENT and the date and time of the observations. We will work with our PC to update these once the orbit of HST is known. For the south, the values of ANG would be essentially these plus 180 degrees (with minor adjustments to avoid the repeller wire), and the CML range would be 310-100 deg.															
Description=PLANET JUPITER															
Extended=YES															
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit				
	1		(7) JUPITER-AURO RA-JUNOEM-25	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99	GS ACQ SCENARI O BASE1BR		2095 Secs (2095 Secs)						
										[=>]		[1]			
Orbit Structure	Orbit 1													Server Version: 20240604	
	GS Acq Moving Target Tracking Exp. 1 Occultation Unused Orbital Visibility = 0 Home														

Proposal 16989 - Visit 26 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Visit	Proposal 16989, Visit 26, completed										Fri Aug 23 14:00:31 GMT 2024	
	Diagnostic Status: Warning											
	Scientific Instruments: STIS/FUV-MAMA											
	Special Requirements: SCHED 40%; BETWEEN 14-OCT-2023:20:11:00 AND 14-OCT-2023:21:11:00											
Comments: 2nd North, middle magnetosphere inbound. If no availaiblity, south in this interval.												
Diagnostics	(Visit 26) Warning (Orbit Planner): GS ACQ SCENARIO REQUESTED INCONSISTENT WITH VISIT GYRO MODE											
	(Exposure 1 (Visit 26)) Warning (Form): Sensitive exposures should have an ETC run number provided.											
	(Exposure 1 (Visit 26) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.											
	(Visit 26) 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					
	(8)	JUPITER-AURORA-JUNOEM-26	STD=JUPITER	TYPE=POS_ANGLE,RAD=24,ANG=340,REF=NORTH		CML OF JUPITER FROM EARTH BETWEEN 120 220	EARTH					
	Comments: This target is for imaging Jupiter's northern auroras. The values of RAD and ANG are dependent on ORIENT and the date and time of the observations. We will work with our PC to update these once the orbit of HST is known. For the south, the values of ANG would be essentially these plus 180 degrees (with minor adjustments to avoid the repeller wire), and the CML range would be 310-100 deg.											
	Description=PLANET JUPITER Extended=YES											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(8) JUPITER-AURO RA-JUNOEM-26	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99	GS ACQ SCENARI O BASE1BR		2095 Secs (2095 Secs)			
									[==>]		[1]	
Orbit Structure	Orbit 1 Server Version: 20240604 GS Acq Moving Target Tracking Setup Exp. 1 Occultation Unused Orbital Visibility = 0 Home											

Proposal 16989 - Visit 27 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Visit	Proposal 16989, Visit 27, completed										Fri Aug 23 14:00:31 GMT 2024																																							
	Diagnostic Status: Warning																																																	
	Scientific Instruments: STIS/FUV-MAMA																																																	
	Special Requirements: SCHED 40%; BETWEEN 15-OCT-2023:21:30:00 AND 15-OCT-2023:22:30:00																																																	
Comments: Ideally start of the northern interval on 22 Jan at 06:18, but if not available we'll shift to the south for the interval post-PJ																																																		
Diagnostics	(Visit 27) Warning (Orbit Planner): GS ACQ SCENARIO REQUESTED INCONSISTENT WITH VISIT GYRO MODE																																																	
	(Exposure 1 (Visit 27)) Warning (Form): Sensitive exposures should have an ETC run number provided.																																																	
	(Exposure 1 (Visit 27) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.																																																	
	(Visit 27) Informational (Form): The Visit Planner and Spike may produce different schedulability results.																																																	
Solar System Targets	<table><thead><tr><th>#</th><th>Name</th><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Window</th><th>Ephem Center</th></tr></thead><tbody><tr><td>(9)</td><td>JUPITER-AURORA-JUNOEM-27</td><td>STD=JUPITER</td><td>TYPE=POS_ANGLE,RAD=25,ANG=160,REF=NORTH</td><td></td><td>NOT CML OF JUPITER FROM EARTH BETWEEN 100 310</td><td>EARTH</td></tr></tbody></table>																				#	Name	Level 1	Level 2	Level 3	Window	Ephem Center	(9)	JUPITER-AURORA-JUNOEM-27	STD=JUPITER	TYPE=POS_ANGLE,RAD=25,ANG=160,REF=NORTH		NOT CML OF JUPITER FROM EARTH BETWEEN 100 310	EARTH																
	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center																																											
	(9)	JUPITER-AURORA-JUNOEM-27	STD=JUPITER	TYPE=POS_ANGLE,RAD=25,ANG=160,REF=NORTH		NOT CML OF JUPITER FROM EARTH BETWEEN 100 310	EARTH																																											
	Comments: This target is for imaging Jupiter's southern auroras. The values of RAD and ANG are dependent on ORIENT and the date and time of the observations. We will work with our PC to update these once the orbit of HST is known. For the south, the values of ANG would be essentially these plus 180 degrees (with minor adjustments to avoid the repeller wire), and the CML range would be 120-220 deg.																																																	
Description=PLANET JUPITER																																																		
Extended=YES																																																		
Exposures	<table><thead><tr><th>#</th><th>Label</th><th>Target</th><th>Config,Mode,Aperture</th><th>Spectral Els.</th><th>Opt. Params.</th><th>Special Reqs.</th><th>Groups</th><th>Exp. Time (Total)/[Actual Dur.]</th><th>Orbit</th></tr></thead><tbody><tr><td>1</td><td></td><td>(9) JUPITER-AURO RA-JUNOEM-27</td><td>STIS/FUV-MAMA, TIME-TAG, F25SRF2</td><td>MIRROR</td><td>BUFFER-TIME=99</td><td>GS ACQ SCENARI O BASE1BR</td><td></td><td>2095 Secs (2095 Secs)</td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>[>=>]</td><td>[1]</td></tr></tbody></table>																				#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	1		(9) JUPITER-AURO RA-JUNOEM-27	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99	GS ACQ SCENARI O BASE1BR		2095 Secs (2095 Secs)										[>=>]	[1]
	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit																																								
	1		(9) JUPITER-AURO RA-JUNOEM-27	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99	GS ACQ SCENARI O BASE1BR		2095 Secs (2095 Secs)																																									
								[>=>]	[1]																																									
Orbit Structure	Orbit 1 Server Version: 20240604 Moving Target Tracking Exp. 1 GS Acq Setup Occultation Home Unused Orbital Visibility = 0																																																	

Proposal 16989 - Visit 28 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Fri Aug 23 14:00:31 GMT 2024

[illegible]

Proposal 16989 - Visit 29 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Visit	Proposal 16989, Visit 29, implementation										Fri Aug 23 14:00:31 GMT 2024
	Diagnostic Status: Warning Scientific Instruments: STIS/FUV-MAMA Special Requirements: SCHED 70%; BETWEEN 19-SEP-2024:14:20:00 AND 19-SEP-2024:15:20:00; VISIBILITY INTERVAL NO GYRO BIAS UPDATE ON MOVING TARGET Comments: This visit is to coincide with the Io flyby (south). Ideally the windows starting 2023-07-30 22:10 or 2023-07-31 08:05, but if not available we will move to another window in the north during this window (or expand a day or so either side of necessary).										
Diagnostics	(Exposure 1 (Visit 29)) Warning (Form): Sensitive exposures should have an ETC run number provided. (Visit 29) 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				
	(11)	JUPITER-AURORA-JUNOEM-29	STD=JUPITER	TYPE=POS_ANGLE,RAD=21,ANG=360,REF=NORTH		CML OF JUPITER FROM EARTH BETWEEN 120 220	EARTH				
	Comments: This target is for imaging Jupiter's southern auroras. The values of RAD and ANG are dependent on ORIENT and the date and time of the observations. We will work with our PC to update these once the orbit of HST is known. For the north, the values of ANG would be essentially these plus 180 degrees (with minor adjustments to avoid the repeller wire), and the CML range would be 120-220 deg. Description=PLANET JUPITER Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(11) JUPITER-AURORA-JUNOEM-29	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2455 Secs (2387 Secs) [=>2387.0 Secs]		[1]
Orbit Structure	Orbit 1										
	Server Version: 20240604										
	GS Acq Setup Moving Target Tracking Exp. 1 Unused Orbital Visibility = 63 Occultation Home </										

Proposal 16989 - Visit 30 - Observing Jupiter's FUV auroras during the Juno Extended Mission

Visit	Proposal 16989, Visit 30, completed Fri Aug 23 14:00:31 GMT 2024					
	Diagnostic Status: Warning Scientific Instruments: STIS/FUV-MAMA Special Requirements: SCHED 40%; BETWEEN 29-JUL-2023:11:50:00 AND 29-JUL-2023:12:50:00; VISIBILITY INTERVAL NO GYRO BIAS UPDATE ON MOVING TARGET <i>Comments: North inbound middle magnetosphere</i>					
Diagnostics	(Visit 30) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN (Exposure 1 (Visit 30)) Warning (Form): Sensitive exposures should have an ETC run number provided. (Visit 30) Informational (Form): The Visit Planner and Spike may produce different schedulability results.					
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Ephem Center
	(12)	JUPITER-AURORA-JUNOEM-30	STD=JUPITER	TYPE=POS_ANGLE,RAD=23,ANG=343,REF=NORTH		CML OF JUPITER FROM EARTH BETWEEN 120 220 EARTH
	<i>Comments: This target is for imaging Jupiter's northern auroras. The values of RAD and ANG are dependent on ORIENT and the date and time of the observations. We will work with our PC to update these once the orbit of HST is known. For the south, the values of ANG would be essentially these plus 180 degrees (with minor adjustments to avoid the repeller wire), and the CML range would be 310-100 deg.</i> Description=PLANET JUPITER Extended=YES					
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.
	1		(12) JUPITER-AURORA-JUNOEM-30	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99
						Exp. Time (Total)/[Actual Dur.]
						2523 Secs (2523 Secs) [==>]
						Orbit
						[1]
Orbit Structure	Orbit 1 Server Version: 20240604					
	Moving Target Tracking Setup GS Acq Exp. 1 Occultation Home ORBITAL VISIBILITY OVERRUN = 5 0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 sec					