14112 - Monitoring the ice plumes of Europa

Cycle: 23, 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	(3) EUROPA-NOTRANSIT-45	STIS/FUV-MAMA	1	29-Jan-2016 21:04:12.0	yes
02	(4) EUROPA-NOTRANSIT-135	STIS/FUV-MAMA	1	29-Jan-2016 21:04:13.0	yes
03	(5) EUROPA-NOTRANSIT-225	STIS/FUV-MAMA	1	29-Jan-2016 21:04:15.0	yes
04	(6) EUROPA-NOTRANSIT-315	STIS/FUV-MAMA	1	29-Jan-2016 21:04:16.0	yes
05	(1) EUROPA-TRANSITA	STIS/FUV-MAMA	1	29-Jan-2016 21:04:17.0	yes
06	(2) EUROPA-TRANSITB	STIS/FUV-MAMA	1	29-Jan-2016 21:04:18.0	yes

6 Total Orbits Used

ABSTRACT

Crucial evidence has been found for plumes of water ice venting from the South polar region of Europa (Roth et al 2014) - spectroscopic detection of off-limb line emission from the dissociation products of water. We are engaged in a sensitive FUV HST imaging program to seek the Europa plumes

and exosphere. The data reveal intriguing evidence for off-limb features, both in absorption as Europa transits the face of Jupiter, and emission, away from transit. Subsequent efforts by Roth et al to re-observe the plumes have yielded only upper limits, requiring that they are variable. The cause of the variability has not been established. Here, we propose a modest, sensitive monitoring program to continue to enhance our understanding of this important phenomenon, and to progress towards a determination of the frequency with which they appear. In transit, our strategy places firm limits on, or measurements of, absorbing columns and their distribution with altitude above the surface of Europa. Out of transit, we are sensitive to FUV emission from forward- or back-scattered sunlight and line emission. If the ice plumes of Europa arise from the deep ocean, we have gained access to probably the most astrobiologically interesting location in the Solar System.

OBSERVING DESCRIPTION

We will obtain a single ACS/SBC prism observation inside and outside eclipse. We will obtain one orbit that sweeps through all filters outside eclipse and the remaining four orbits will be inside eclipse. Three use broad filters and one uses the narrow band optical filters to seek auroral emission.

Visit

Proposal 14112, Visit 01, implementation Sat Jan 30 02:04:19 GMT 2016

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: SCHED 90%; BETWEEN 12-FEB-2016:00:00:00 AND 03-APR-2016:00:00:00

Diagnostics

(Exposure 1 (Visit 01)) Warning (Form): Sensitive exposures should have an ETC run number provided.

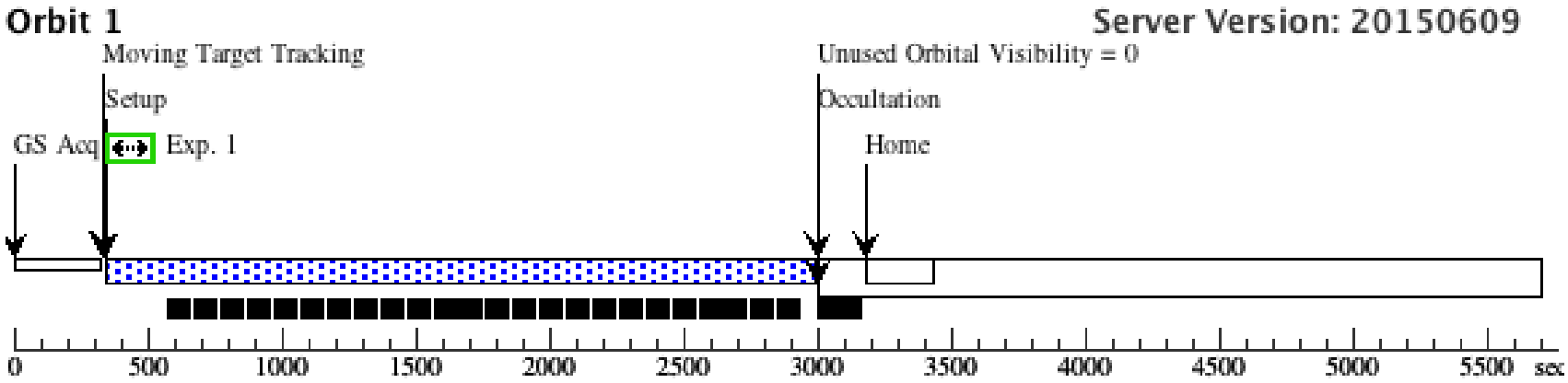
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(3)	EUROPA-NOTRANSIT-45	STD=JUPITER	STD=EUROPA	TYPE=POS_ANGLE,RAD=6.5,ANG=44,REF=NORTH,R_RAD=-51.0,R_ANG=0.0,EPOCH=2016.070:05:12:00,EpochTimeScale=UTC	OLG OF EUROPA BETWEEN 40 50	EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) EUROPA-NOTRANSIT-45	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2700 Secs (2501 Secs) *[==>2501.0 Secs]*	*[1]*

Orbit Structure



Visit

Proposal 14112, Visit 02, implementation Sat Jan 30 02:04:19 GMT 2016

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: SCHED 90%; BETWEEN 12-FEB-2016:00:00:00 AND 03-APR-2016:00:00:00

Diagnostics

(Exposure 1 (Visit 02)) Warning (Form): Sensitive exposures should have an ETC run number provided.

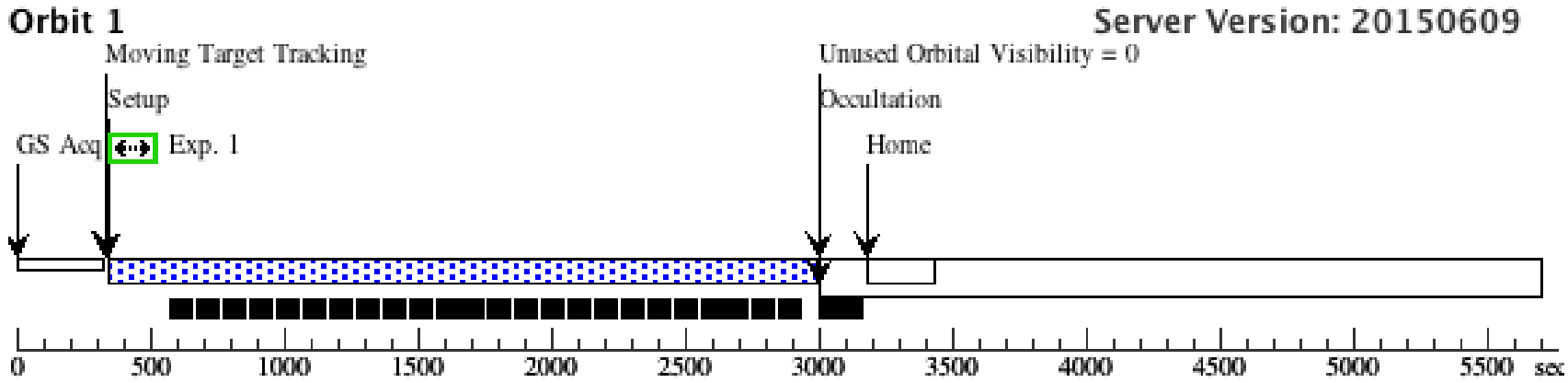
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(4)	EUROPA-NOTRANSIT-135	STD=JUPITER	STD=EUROPA	TYPE=POS_ANGLE,RAD=6.5,ANG=44,REF=NORTH,R_RAD=-51.0,R_ANG=0.0,EPOCH=2016.060:11:25:00,EpochTimeScale=UTC	OLG OF EUROPA BETWEEN 130 140	EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) EUROPA-NOTRANSIT-135	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99	GS ACQ SCENARIO BASE1B3		2700 Secs (2501 Secs) *[==>2501.0 Secs]*	*[1]*

Orbit Structure



Visit

Proposal 14112, Visit 03, implementation Sat Jan 30 02:04:19 GMT 2016

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: SCHED 90%; BETWEEN 12-FEB-2016:00:00:00 AND 03-APR-2016:00:00:00

Diagnostics

(Exposure 1 (Visit 03)) Warning (Form): Sensitive exposures should have an ETC run number provided.

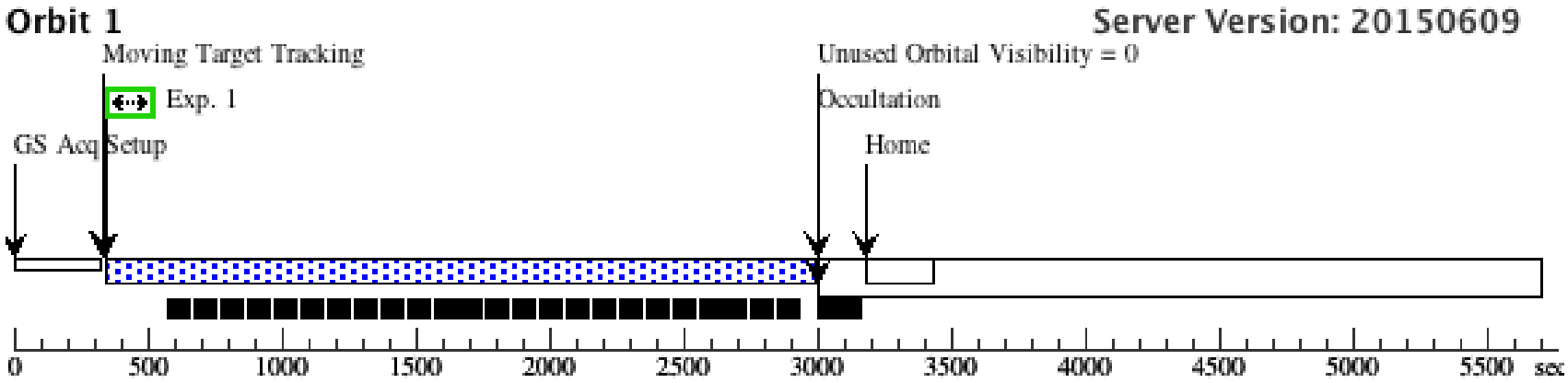
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(5)	EUROPA-NOTRANSIT-225	STD=JUPITER	STD=EUROPA	TYPE=POS_ANGLE,RAD=6.5,ANG=44,REF=NORTH,R_RAD=-51.0,R_ANG=0.0,EPOCH=2016.057:19:47:30,EpochTimeScale=UTC	OLG OF EUROPA BETWEEN 220 230	EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(5) EUROPA-NOTRANSIT-225	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2700 Secs (2501 Secs) *[==>2501.0 Secs]*	*[1]*

Orbit Structure



Visit

Proposal 14112, Visit 04, implementation Sat Jan 30 02:04:19 GMT 2016

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: SCHED 90%; BETWEEN 12-FEB-2016:00:00:00 AND 03-APR-2016:00:00:00

Diagnostics

(Exposure 1 (Visit 04)) Warning (Form): Sensitive exposures should have an ETC run number provided.

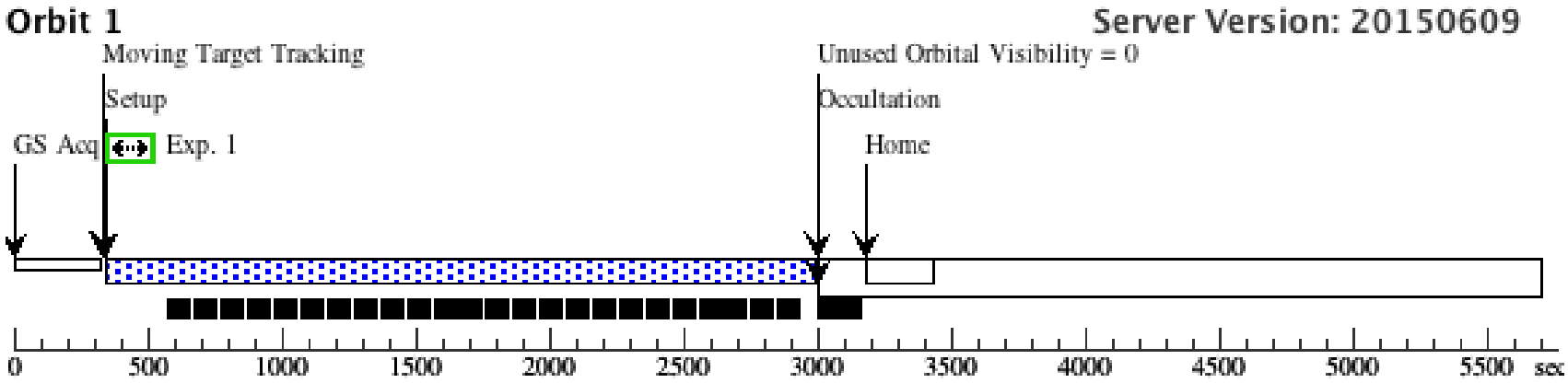
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(6)	EUROPA-NOTRANSIT-315	STD=JUPITER	STD=EUROPA	TYPE=POS_ANGLE,RAD=6.5,ANG=44,REF=NORTH,R_RAD=-51.0,R_ANG=0.0,EPOCH=2016.051:14:18:00,EpochTimeScale=UTC	OLG OF EUROPA BETWEEN 310 320	EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(6) EUROPA-NOTRANSIT-315	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2700 Secs (2501 Secs) *[==>2501.0 Secs]*	*[1]*

Orbit Structure



Visit

Proposal 14112, Visit 05, implementation Sat Jan 30 02:04:19 GMT 2016

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: SCHED 90%; BETWEEN 12-FEB-2016:00:00:00 AND 05-MAR-2016:20:00:00; BETWEEN 11-MAR-2016:03:00:00 AND 03-APR-2016:00:00:00

Comments: Time constraints are so that Sun-Target-Observer angle is greater than 0.6 deg (latter to avoid shadow behind target) and Europa diameter is >0.95 arcsec

Diagnostics

(Exposure 1 (Visit 05)) Warning (Form): Sensitive exposures should have an ETC run number provided.

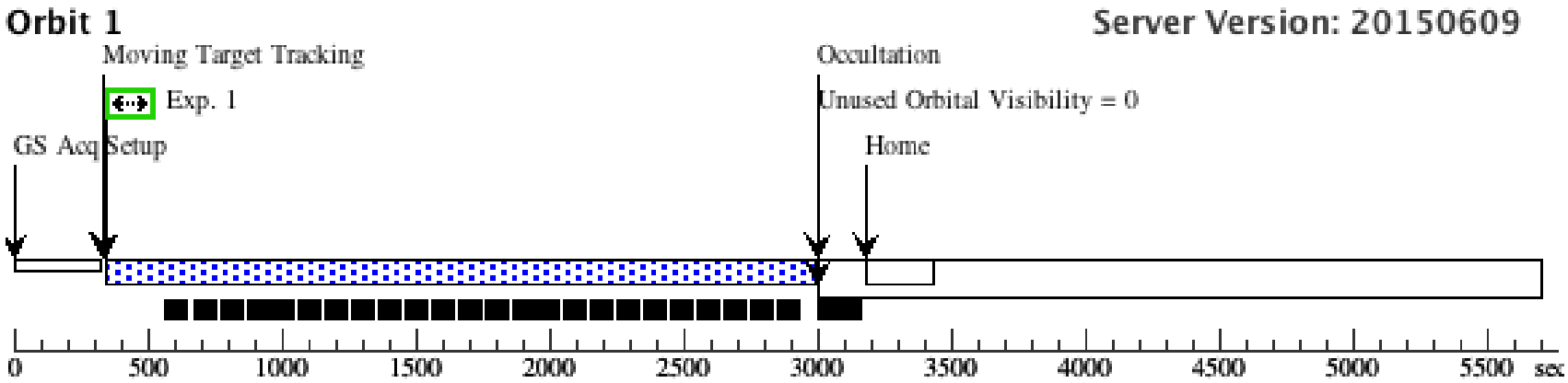
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	EUROPA-TRANSITA	STD=JUPITER	STD=EUROPA	TYPE=POS_ANGLE,RAD=6.5,ANG=224,REF=NORTH,R_RAD=-51.0,R_ANG=0.0,EPOCH=2016.053:20:22:00,EpochTimeScale=UTC	TRANSIT OF EUROPA ACROSS JUPITER FROM EARTH, SEP OF EUROPA JUPITER FROM EARTH LT -5" MOSS Show Windows: true	EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) EUROPA-TRANSITA	STIS/FUV-MAMA, TIME-TAG, F25QTZ	MIRROR	BUFFER-TIME=99			2700 Secs (2508 Secs) *[==>2508.0 Secs]*	*[1]*

Orbit Structure



Visit

Proposal 14112, Visit 06, implementation Sat Jan 30 02:04:19 GMT 2016

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: SCHED 90%; BETWEEN 12-FEB-2016:00:00:00 AND 05-MAR-2016:20:00:00; BETWEEN 11-MAR-2016:03:00:00 AND 03-APR-2016:00:00:00

Comments: Time constraints are so that Sun-Target-Observer angle is greater than 0.6 deg (latter to avoid shadow behind target) and Europa diameter is >0.95 arcsec

Diagnostics

(Exposure 1 (Visit 06)) Warning (Form): Sensitive exposures should have an ETC run number provided.

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	EUROPA-TRANSITB	STD=JUPITER	STD=EUROPA	TYPE=POS_ANGLE,RAD=6.5,ANG=44,REF=NORTH,R_RAD=-51.0,R_ANG=0.0,EPOCH=2016.064:10:51:00,EpochTimeScale=UTC	TRANSIT OF EUROPA ACROSS JUPITER FROM EARTH, SEP OF EUROPA JUPITER FROM EARTH LT -5" MOSS Show Windows: true	EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) EUROPA-TRANSITB	STIS/FUV-MAMA, TIME-TAG, F25QTZ	MIRROR	BUFFER-TIME=99			2700 Secs (2508 Secs) *[==>2508.0 Secs]*	 ***[1]***

Orbit Structure