14930 - Coordinated HST and SOFIA observations of Europa's plumes

Cycle: 24, Proposal Category: GO/DD

(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) EUROPA-TRANSIT-1	STIS/FUV-MAMA	1	15-May-2017 21:00:37.0	yes
02	(2) EUROPA-TRANSIT-2	STIS/FUV-MAMA	1	15-May-2017 21:00:38.0	yes
03	DARK	STIS/FUV-MAMA	1	15-May-2017 21:00:39.0	yes

3 Total Orbits Used

ABSTRACT

The presence of plumes of water ice venting from the icy surface of Europa is of tremendous interest to the scientific community, NASA and the general public, as it offers the prospect of access to material that was once in Europa's ocean without the need to drill through miles of ice. With a proven method that has returned crucial scientific data, and garnered exceptional attention, we propose two additional HST observations of Europa as it transits the smooth face of Jupiter, to bracket upcoming observations on NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA), May

26, 2017. That program is deemed of strategic importance to SOFIA, and a special flight has been arranged to observe the crucial trailing hemisphere where the best plume candidate is to be found. In Sparks et al (2017) it was shown that the candidate has repeated and that it is coincident with a thermal anomaly, as might be expected by analogy with Enceladus. With high-resolution SOFIA mid-IR spectroscopy, we will seek water vapor directly, and esimate surface temperatures at longer wavelengths. Here, we propose to establish whether there is evidence of ongoing contemporaneous plume activity viewed in the FUV by bracketing the SOFIA observation as closely as the schedule allows, offering the prospect of fully validating the HST inference that there are active water plumes. 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 use the high resolution TIME-TAG FUV imaging mode of STIS, to obtain two images of Europa in transit against the face of Jupiter, timed to bracket an upcoming SOFIA observation. We will use the F25SRF2 filter and drift the image of Europa across the detector using moving target specifications to Level 3. Each image is a single visit, of maximum duration permitted by the orbit.

Visit

Proposal 14930, Visit 01, scheduling

Tue May 16 01:00:40 GMT 2017

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: BETWEEN 25-MAY-2017:00:00:00 AND 28-MAY-2017:00:00:00

Diagnostics

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

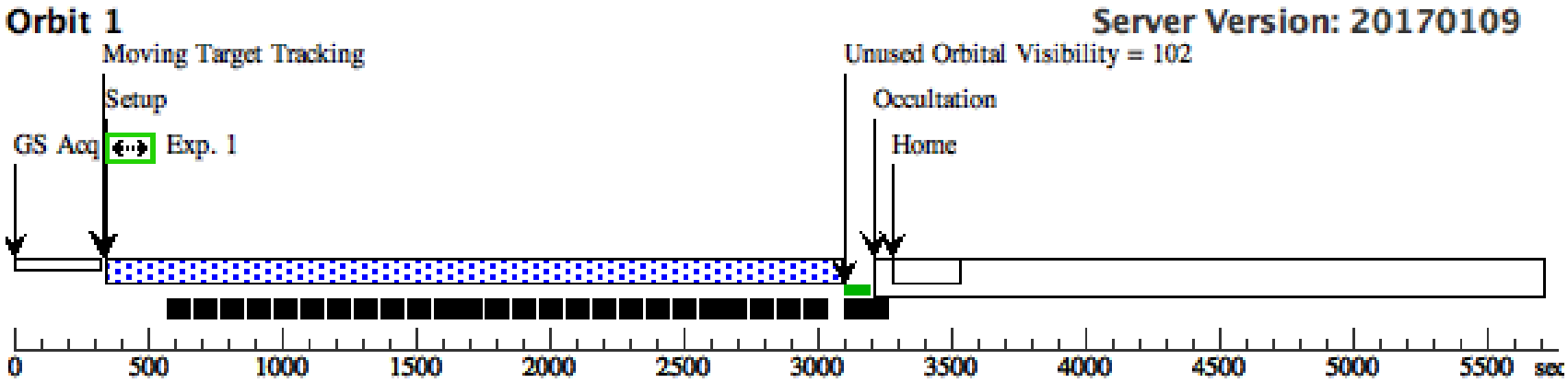
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(1)	EUROPA-TRANSIT-1	STD=JUPITER	STD=EUROPA	TYPE=POS_ANGLE,RAD=6.5,ANG=249.0,REF=NORTH,R_RAD=-51.,R_ANG=0,EPOCH=26-MAY-2017:03:56:50,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-TRANSIT-1	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2600 Secs (2600 Secs) *[==>]*	*[1]*

Orbit Structure



Visit

Proposal 14930, Visit 02, scheduling Tue May 16 01:00:40 GMT 2017

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: BETWEEN 11-JUN-2017:00:00:00 AND 13-JUN-2017:00:00:00

Diagnostics

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

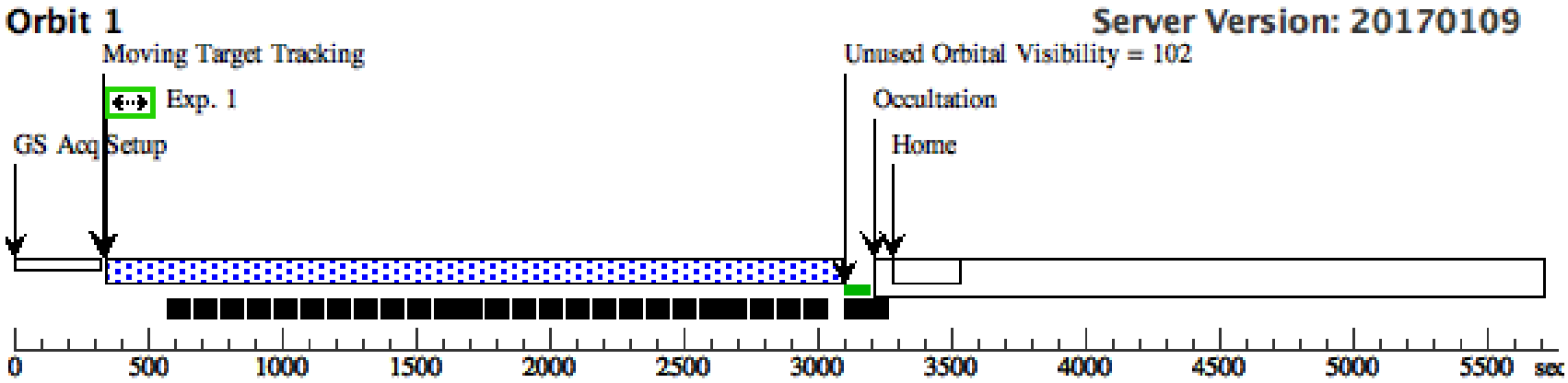
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(2)	EUROPA-TRANSIT-2	STD=JUPITER	STD=EUROPA	TYPE=POS_ANGLE,RAD=6.5,ANG=231.0,REF=NORTH,R_RAD=-51.,R_ANG=0,EPOCH=12-JUN-2017:21:57:05,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-TRANSIT-2	STIS/FUV-MAMA, TIME-TAG, F25SRF2	MIRROR	BUFFER-TIME=99			2600 Secs (2600 Secs)	
								[==>]	*[1]*

Orbit Structure



Visit

Proposal 14930, Visit 03 Tue May 16 01:00:40 GMT 2017

Diagnostic Status: Error

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: BETWEEN 12-JUN-2017:00:00:00 AND 13-JUN-2017:00:00:00

Comments: This visit is set as a "buddy visit" to turn on the MAMA prior to the beginning of visit 02

Diagnostics

(DARK before 02 (03.001)) Error (Form): DEF is not a valid selection.

(DARK before 02 (03.001)) Error (Form): Illegal selection: DEF.

(DARK before 02 (03.001)) Error (Form): Target DARK is no longer a valid selection

(DARK before 02 (03.001)) Error (Form): This attribute is not allowed to have this value: Aperture = DEF
It is an Available option and cannot normally be used in a GO proposal.

(DARK before 02 (03.001)) Error (Form): This attribute is not allowed to have this value: Calibration_Target = DARK
It is a Restricted option and can only be used in an engineering proposal.

(DARK before 02 (03.001)) Error (Form): This attribute is not allowed to have this value: Spectral_Element = DEF
It is an Available option and cannot normally be used in a GO proposal.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	DARK before 02	DARK	STIS/FUV-MAMA, ACCUM, DEF	DEF				1000 Secs (1000 Secs) *[==>]*	*[1]*

Orbit Structure