14795 - Observing an artificial meteor: Cassini's entry into the atmosphere of Saturn

Cycle: 24, 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) SATURN	STIS/FUV-MAMA	1	29-Jul-2016 15:48:24.0	yes

1 Total Orbits Used

ABSTRACT

The Cassini spacecraft's mission at Saturn will end after over 13 years in orbit, on September 15th, 2017. The spacecraft will be disposed of by impacting Saturn and its atmospheric entry will be that of an artificial meteor. The resulting bolide will be observable in the far ultraviolet using Hubble Space Telescope's STIS instrument. We propose to observe this event using STIS-FUV MAMA, in TIME-TAG imaging mode. The goal of

this observation is to determine the luminous efficiency of hypervelocity impacts on gas giants. Recent observations of meteor flashes on Jupiter could be used to determine the flux and size distribution of meteors in the outer solar system, but only if the luminoius efficiency is known. With a well-known mass (2186 kg) and impact velocity (34.9 km/s), the Cassini impact will provide this information. An additional goal is the validate and improve the existing model of Saturn's atmosphere, between 1 nanobar and a few microbars. This region is of particular interest to the interpretation of aurora observations and to the development of future missions involving atmospheric probes.

OBSERVING DESCRIPTION

The Cassini spacecraft's mission at Saturn will end after over 13 years in orbit, on September 15th, 2017. The spacecraft will be disposed of by impacting Saturn and its atmospheric entry will be that of an artificial meteor. The resulting bolide will be observable in the far ultraviolet using Hubble Space Telescope's STIS instrument. We propose to observe this event using STIS-FUV MAMA, in TIME-TAG imaging mode. The goal of this observation is to determine the luminous efficiency of hypervelocity impacts on gas giants. Recent observations of meteor flashes on Jupiter could be used to determine the flux and size distribution of meteors in the outer solar system, but only if the luminoius efficiency is known. With a well-known mass (2186 kg) and impact velocity (34.9 km/s), the Cassini impact will provide this information. An additional goal is the validate and improve the existing model of Saturn's atmosphere, between 1 nanobar and a few microbars. This region is of particular interest to the interpretation of aurora observations and to the development of future missions involving atmospheric probes.

Visit

Proposal 14795, Saturn During Cassini Entry (01)

Fri Jul 29 19:48:25 GMT 2016

Diagnostic Status: Warning

Scientific Instruments: STIS/FUV-MAMA

Special Requirements: BETWEEN 15-SEP-2017:12:00 AND 15-SEP-2017:12:25

Diagnostics

(Exposure 1 (Saturn During Cassini Entry (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)	SATURN	STD=SATURN			NOT ECL P PARTIAL OF SATURN BY TITAN FROM EARTH, SEP OF SATURN RHEA FROM EARTH GT 10", SEP OF SATURN TITAN FROM EARTH GT 10"	EARTH

Comments: Extended=YES

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SATURN	STIS/FUV-MAMA, TIME-TAG, 25MAMA	MIRROR	BUFFER-TIME=100.			2500 Secs (2500 Secs)	
								[==>]	***[1]***

Orbit Structure