



11971 - A Rare Mutual Event between Satellites of the Dwarf Planet Haumea

Cycle: 16, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

INVESTIGATORS

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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>
01	(1) HAUMEA	WFPC2	5	23-Jan-2009 21:01:09.0	yes

5 Total Orbits Used

ABSTRACT

The dwarf planet Haumea has a fascinating history, including the formation of two large satellites by an ancient mantle-shattering collision. Haumea also has an exciting future with many observable mutual events between Haumea and the smaller inner moon Namaka predicted for the next several years. The Haumea-Namaka mutual events will provide a wealth of information that is otherwise unattainable: the size, shape, and spin pole of Haumea; the size, albedo, and density of Namaka; and precise orbital constraints. The orbital orientation is not as favorable for the outer, larger satellite Hi'iaka, but the last two possible mutual events between Hi'iaka and Namaka occur in 2009 and will not occur again for decades. We propose a short (5-orbit) WFPC2 resolved photometry program to observe the first of these events, which will occur with an estimated ~75% probability. Even catching a partial event will measure the density of Hi'iaka to within ~15% and provide unique insight in the formation and evolution of this exciting system.

OBSERVING DESCRIPTION

Observations of a satellite-satellite mutual event of the dwarf planet Haumea. The goal is to obtain precise photometry of a (resolved) faint satellite to a moving object. The observations are designed to maximize overall signal-to-noise (by maximizing total exposure time), while taking multiple observations to produce a high-cadence light curve.

All 5 orbits must be taken as close as possible to (04-FEB-2009 21:20:00). Five consecutive orbits must be taken, with the first exposure occurring between 04-FEB-2009:16:20:00 and 04-FEB-2009:18:20:00.

Proposal 11971 - Visit 01 - A Rare Mutual Event between Satellites of the Dwarf Planet Haumea

Visit	Proposal 11971, Visit 01, implementation										Sat Jan 24 02:01:28 GMT 2009
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: WFPC2										
Solar System Targets	Special Requirements: BETWEEN 04-FEB-2009:16:20:00 AND 04-FEB-2009:18:20:00										
	Comments: Observation of the Haumea Satellite-Satellite Mutual Event. The 5 consecutive orbits should be centered as closely as possible to 04-FEB-2009:21:20:00, the best estimate of the event time. The observations are designed to maximize overall signal-to-noise (by maximizing total exposure time), while taking multiple observations to produce a high-cadence light curve. To decrease overhead and maintain photometric stability, we chose not to dither the observations, though the satellites will move between observations and orbits (overall motion of ~1 pixel). Observations should consist of the maximum number of 100-second exposures possible over the course of 5 orbits.										
	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center				
(1)	HAUMEA	TYPE=ASTEROID,A=43.1359862,E=0.1949506,I=28.22440,O=122.10320,W=239.18665,M=202.66919,EQUINOX=J2000,EPOCH=30-NOV-2008:00:00:00				EARTH					
Comments: At the time of the observations, the approximate RA and Dec are 13:43:09.10 +18:53:40.3											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit	
	1	HAUMEA	(1) HAUMEA	WFPC2, IMAGE, PC1	F606W		POS TARG -7,-8; GS ACQ SCENARI O BASE1T3	Sequence 1-1 Non-Int	100 Secs X 14		
	[==>(Copy 1)]									[1]	
	[==>(Copy 2)]										
	[==>(Copy 3)]										
	[==>(Copy 4)]										
	[==>(Copy 5)]										
	[==>(Copy 6)]										
	[==>(Copy 7)]										
	[==>(Copy 8)]										
	[==>(Copy 9)]										
	[==>(Copy 10)]										
	[==>(Copy 11)]										
	[==>(Copy 12)]										
	[==>(Copy 13)]										
[==>(Copy 14)]											

Proposal 11971 - Visit 01 - A Rare Mutual Event between Satellites of the Dwarf Planet Haumea

Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	2	HAUMEA	(1) HAUMEA	WFPC2, IMAGE, PC1	F606W		POS TARG -7,-8	Sequence 2-2 Non-Int	100 Secs X 14	
									[==>(Copy 1)]	[2]
									[==>(Copy 2)]	
									[==>(Copy 3)]	
									[==>(Copy 4)]	
									[==>(Copy 5)]	
									[==>(Copy 6)]	
									[==>(Copy 7)]	
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									[==>(Copy 10)]	
									[==>(Copy 11)]	
									[==>(Copy 12)]	
									[==>(Copy 13)]	
									[==>(Copy 14)]	
Exposures (continued)	3	HAUMEA	(1) HAUMEA	WFPC2, IMAGE, PC1	F606W		POS TARG -7,-8	Sequence 3-3 Non-Int	100 Secs X 14	
									[==>(Copy 1)]	[3]
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									[==>(Copy 3)]	
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									[==>(Copy 6)]	
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									[==>(Copy 10)]	
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									[==>(Copy 13)]	
									[==>(Copy 14)]	

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Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	4	HAUMEA	(1) HAUMEA	WFPC2, IMAGE, PC1	F606W		POS TARG -7,-8	Sequence 4-4 Non-Int	100 Secs X 14	
									[==>(Copy 1)]	[4]
									[==>(Copy 2)]	
									[==>(Copy 3)]	
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									[==>(Copy 6)]	
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									[==>(Copy 11)]	
									[==>(Copy 12)]	
									[==>(Copy 13)]	
									[==>(Copy 14)]	
	5	HAUMEA	(1) HAUMEA	WFPC2, IMAGE, PC1	F606W		POS TARG -7,-8	Sequence 5-5 Non-Int	100 Secs X 12	
									[==>(Copy 1)]	[5]
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