12671 - High-Precision Proper Motions in the M87 Jet

Cycle: 19, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
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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) M87-NUCLEUS	STIS/NUV-MAMA	1	25-Jul-2011 21:21:55.0	yes

1 Total Orbits Used

ABSTRACT

As the nearest galaxy with an optical jet, M87 affords an unparalleled opportunity to study extragalactic jet phenomena at the highest resolution. We have previously obtained HST images of the jet with unprecedented resolution which show detailed shock structures as well as numerous unresolved condensations over the first few arcseconds of the jet. Our previous HST monitoring observations have found superluminal motion at speeds up to 6c in many of these features, and showed the formation of new emission regions and rapid variability.

The recently repaired STIS/NUV instrument now presents a unique opportunity to measure proper motions in the M87 jet with a single highly stable, high resolution instrument across a 13 yr timebase. We will use these new data, together with STIS/NUV data from 1999-2003 to map the velocity field of the jet to much higher accuracy than previously possible. This will allow us to measure the bulk deceleration of the jet, transverse motions, accelerations / decelerations of individual features, and numerous fainter jet features. We will use this to test models for the structure and kinematics

of relativistic jet flows, synchrotron emission regions, and AGN in general.

OBSERVING DESCRIPTION

We will obtsin STIS NUV/F25QTZ images of the jet using a setup which closely duplicates our previous monitor observations.
Sub-exposures will be dithered to improve PSF sampling by the 0.024" pixels and minimize detector artifacts. There should be no bright object issues for either the M87 nucleus or jet.

Visit

Proposal 12671, Visit 01 Tue Jul 26 01:21:59 GMT 2011

Diagnostic Status: Warning

Scientific Instruments: STIS/NUV-MAMA

Special Requirements: SCHED 100%; ORIENT 103.D TO 110. D

Comments: Prefer scheduling during July - August 2012 visibility window.

Diagnostics

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

(Exposure 2 (Visit 01)) Warning (Form): Sensitive exposures should have an ETC run number provided.

(Exposure 3 (Visit 01)) Warning (Form): Sensitive exposures should have an ETC run number provided.

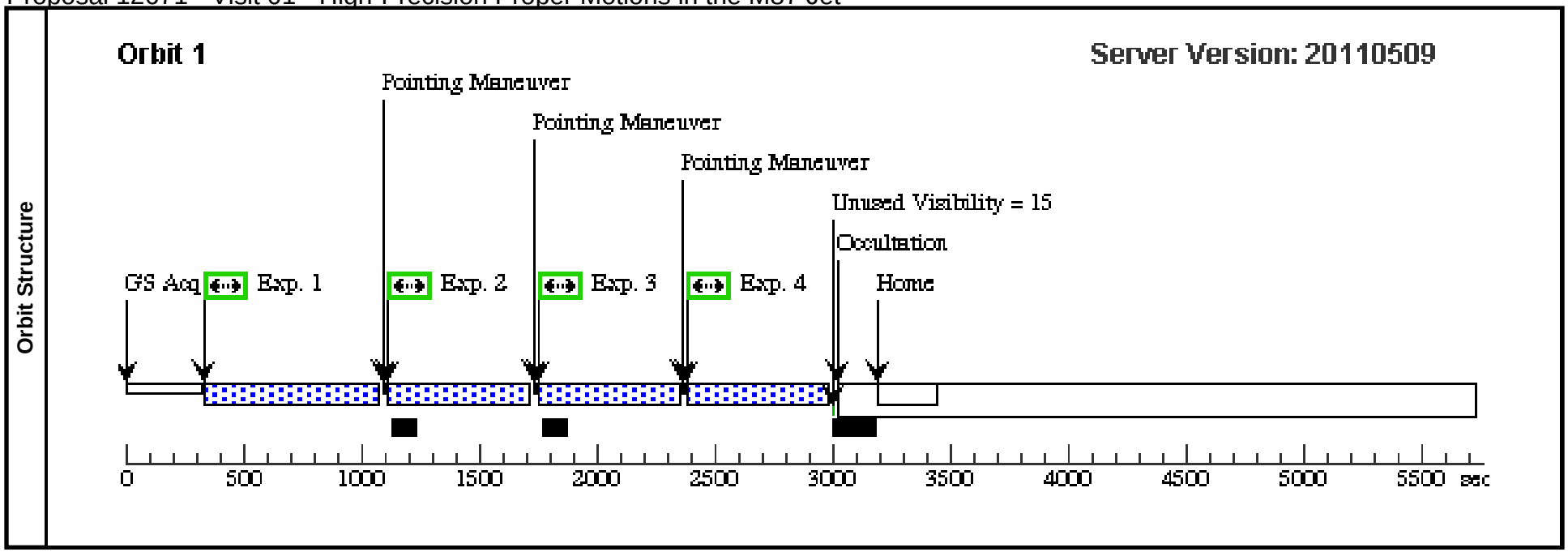
(Exposure 4 (Visit 01)) Warning (Form): Sensitive exposures should have an ETC run number provided.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	M87-NUCLEUS	RA: 12 30 49.4300 (187.7059583d) Dec: +12 23 28.90 (12.39136d) Equinox: J2000		V=16.7	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) M87-NUCLEUS	STIS/NUV-MAMA, ACCUM, F25QTZ	MIRROR		POS TARG -7,7		590 Secs *[==>]*	 ***[1]***
2		(1) M87-NUCLEUS	STIS/NUV-MAMA, ACCUM, F25QTZ	MIRROR		POS TARG -6.496,6 .748		590 Secs *[==>]*	 ***[1]***
3		(1) M87-NUCLEUS	STIS/NUV-MAMA, ACCUM, F25QTZ	MIRROR		POS TARG -6.244,6 .244		590 Secs *[==>]*	 ***[1]***
4		(1) M87-NUCLEUS	STIS/NUV-MAMA, ACCUM, F25QTZ	MIRROR		POS TARG -6.748,6 .496		590 Secs *[==>]*	 ***[1]***


Orbit Structure
Orbit 1
Server Version: 20110509
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 15
Occultation
GS Acq
Exp. 1
Exp. 2
Exp. 3
Exp. 4
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec