



15175 - An Infrared Imaging Test of the IC/CMB Model for the Unusual Spectrum of AP Librae

Cycle: 25, Proposal Category: GO
(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) APLIBRAE	WFC3/IR	2	18-Jul-2017 14:02:27.0	yes

2 Total Orbits Used

ABSTRACT

We propose infrared imaging of a recently-discovered anomalous X-ray emitting jet in the nearby source AP Librae, which underwent a flare observed by the Fermi gamma-ray space telescope in August 2016. The H.E.S.S. observatory also unexpectedly detected this source at TeV energies in 2015. Multiple papers have been written since the H.E.S.S. discovery speculating on the emission process due to the extremely broad and unusually shaped spectrum from X-rays to very high energy, and it has been claimed that the >10 GeV through TeV emission is not from the unresolved blazar core, but rather inverse-Compton upscattering of CMB photons by a still highly-relativistic kpc-scale jet. However, this model is called into question by the recent flaring activity. A clear test of the IC/CMB model can be made through a short WFC3/IR observation due to the fact that the model makes a fixed prediction for the precise level of infrared emission from the jet. Further, if the infrared emission is confirmed, the

IC/CMB model implies fast proper motions on the kpc scale, on the order of 10c, which can be easily detected via a follow-up HST observation in ~3-4 years, which is just possible within the operating lifetime of Hubble, with the currently proposed observations serving as the first epoch. A non-detection would clearly rule out the IC/CMB model, and either result would inform the approach for appropriate follow-up observations with HST, ALMA, and Chandra.

OBSERVING DESCRIPTION

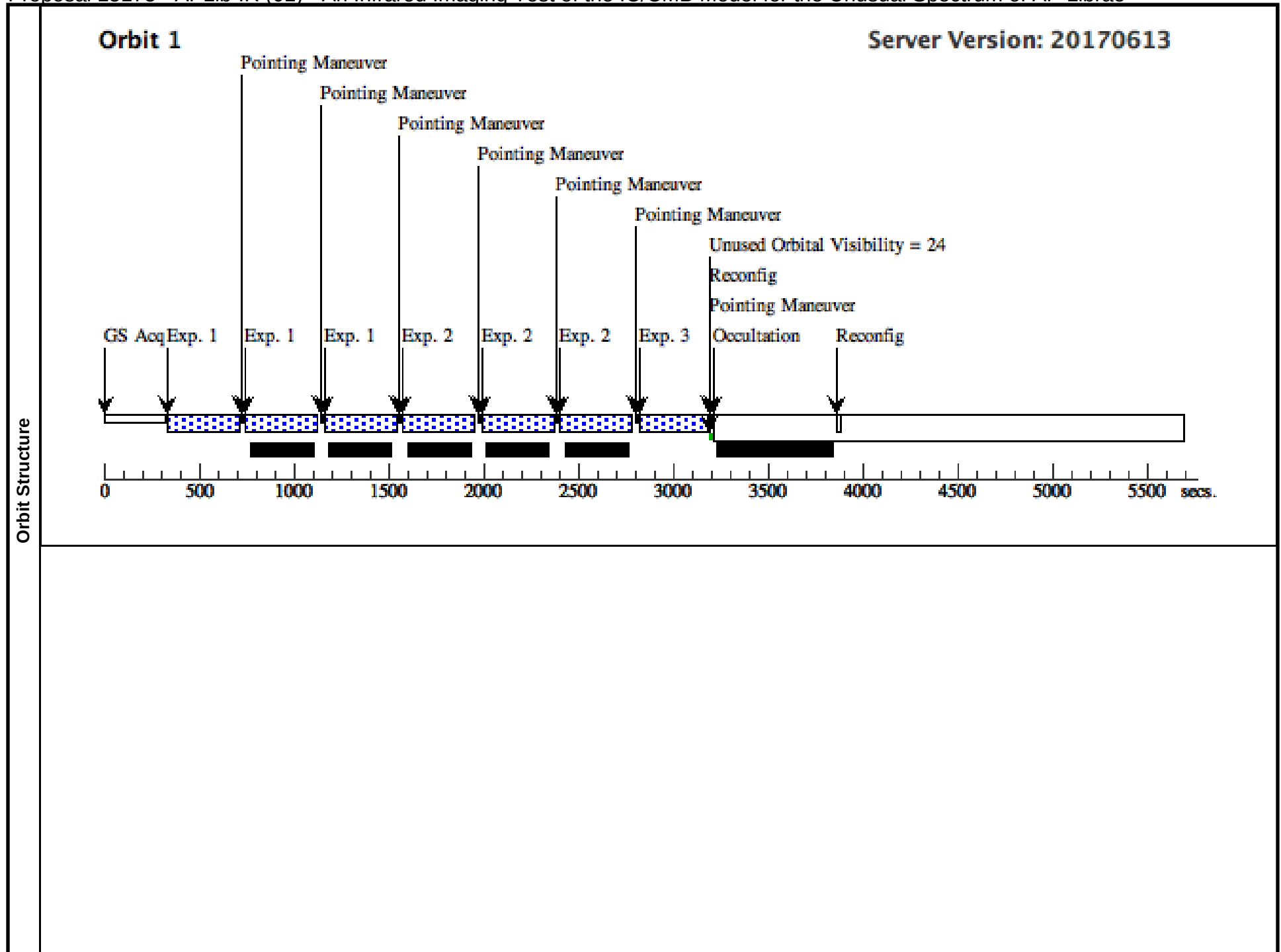
These is a straightforward IR imaging observation of an optical jet. The bright core of the quasar is the main technical concern. Orient constraints have been specified so the 15" jet (as seen in X-rays) is not over-run by the bright wing/spike from the PSF of either the core or the nearby bright source.

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Visit	Proposal 15175, APLib-IR (01) Tue Jul 18 18:02:29 GMT 2017				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: ORIENT 330D TO 10 D; ORIENT 60D TO 100 D; ORIENT 150D TO 190 D; ORIENT 240D TO 280 D <i>Comments: IR imaging to detect the radio/X-ray jet of AP Lib.</i>				
Patterns	#	Primary Pattern		Secondary Pattern	Exposures
	(1)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false			(1), (4)
	(2)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=221.788 Angle Between Sides= Center Pattern=false			(2), (5)
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
	(1)	APLIBRAE	RA: 15 17 41.8131 (229.4242212d) Dec: -24 22 19.48 (-24.37208d) Equinox: J2000		V=14.0
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>					
Miscellaneous Reference Frame: SIMBAD					

Proposal 15175 - APLib-IR (01) - An Infrared Imaging Test of the IC/CMB Model for the Unusual Spectrum of AP Librae

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) APLIBRAE	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=15		Pattern 1, Exps 1-1 i n APLib-IR (01) (1)	352.939501 Secs (1058.819 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]	[1]
	2		(1) APLIBRAE	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=15	POS TARG 0.5,0	Pattern 2, Exps 2-2 i n APLib-IR (01) (2)	352.939501 Secs (1058.819 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]	[1]
	3		(1) APLIBRAE	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=14	POS TARG -0.5,0		327.938986 Secs (327.939 Secs) [==>]	[1]
	4		(1) APLIBRAE	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=15	POS TARG 0,0.5	Pattern 1, Exps 4-4 i n APLib-IR (01) (1)	352.939501 Secs (1058.819 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]	[2]
	5		(1) APLIBRAE	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=15	POS TARG 0,-0.5	Pattern 2, Exps 5-5 i n APLib-IR (01) (2)	352.939501 Secs (1058.819 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]	[2]
	6		(1) APLIBRAE	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 50; NSAMP=10	POS TARG -0.5,-0.5		452.93635 Secs (452.936 Secs) [==>]	[2]



Orbit 2

Server Version: 20170613

