18192 - Dual Fe Ka peaks in MCG-03-34-64 - a close merger pair in the local Universe?

Cycle: 33, Proposal Category: GO

(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) MCG-03-34-064	STIS/CCD	2	03-Dec-2025 09:00:13.0	yes

2 Total Orbits Used

ABSTRACT

ACIS imaging of the nearby Seyfert MCG-03-34-64 has revealed two spatially-resolved peaks of luminous Fe Ka line emission, coincident with radio peaks, comprising a candidate dual AGN. If confirmed, this merger pair - at a separation of just 100 pc - would be the closest dual nuclei detected in multi waveband analysis to date. Establishment of close nuclear pairs offers critical model constraints for galaxy/AGN

co-evolution. However, a single nucleus plus shocked gas provides an alternative model for the data. We request 200 ks of ACIS-S time (4x the existing exposure), supported by 2 orbits of HST STIS, to confirm the statistical significance and origin of the Fe Ka peaks and confidently parameterize this important system.

OBSERVING DESCRIPTION

In order to map the spatially-resolved kinematics of the NLR emission-line gas, we request a STIS G430M spectrum of [O III] 5007|*| through the 0:200 - 5200 slit. With this, we will achieve a velocity resolution of |*| 60 km/, which is ideal for separating distinct kinematic components and measuring accurate velocity dispersions for each component. The slit will be oriented to cover the bright knots of [O III] present in the archival ACS narrow-band image, with a |*|20 deg tolerance. Based on the [OIII] image, the peak [OIII] fluxes are similar corresponding to a surface brightness of 2|*|10|*|13 erg s|*|1 cm|*|2 arcsec|*|2, while the wings have surface brightness 5|*|10|*|14 erg s|*|1 cm|*|2 arcsec|*|2 and the fainter regions have surface brightness 3|*|10|*|15 erg s|*|1 cm|*|2 arcsec|*|2. Using the STIS ETC, and the NGC 1068 spectrum (to represent a Seyfert 2) normalized to the [O III] line with an integration of 40 minutes and the 0:200 |*| 5200 slit, we will achieve a SNR = 75, 33, 3.5 for the 3 regions defined by the 3 [O III] knots. Therefore, we require one orbit for the G430M spectrum.

In order to constrain the ionization mechanisms for the optical emission-line gas, we request a G430L spectrum with the same slit and orientation used for the G430M. We base our exposure request on the need to obtain useful S/N for [Ne V] 3426|*|, which, based on the archival ESO-VLT X-Shooter spectra, has a flux 10% that of the integrated [O III] emission, corresponding to a surface brightness of |*| 4 |*| 10|*|13 erg s|*|1 cm|*|2 arcsec|*|2. Using the ETC, we determine that in a 40 minute exposure we will obtain a SNR |*| 7.5 at the average surface brightness, and SNR |*| 3 at 1:5 |*| 10|*|13 erg s|*|1 cm|*|2 arcsec|*|2. The [O II] 3727|*| , [Ne III] 3869|*| , and [O III] 5007 |*| lines are all su|*|ciently bright to map the ionization structure of the NLR with the proposed data, at a slightly lower S/N than that detailed for [O III], above. We require one orbit for the G430L spectrum. For each spectrum, we will obtain three sub exposures at slightly di|*|erent positions along the slit to facilitate the removal of cosmic rays and hot pixels on the CCD images. We will obtain these exposures near the top of the chip (the E1 position) to minimize CTE loss.

Visit

Proposal 18192, Visit 01, implementation Wed Dec 03 14:00:14 GMT 2025

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 50D TO 95 D; ORIENT 230D TO 275 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2), (3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=0.567	Center Pattern=false		
	Line Spacing=			

Fixed Targets

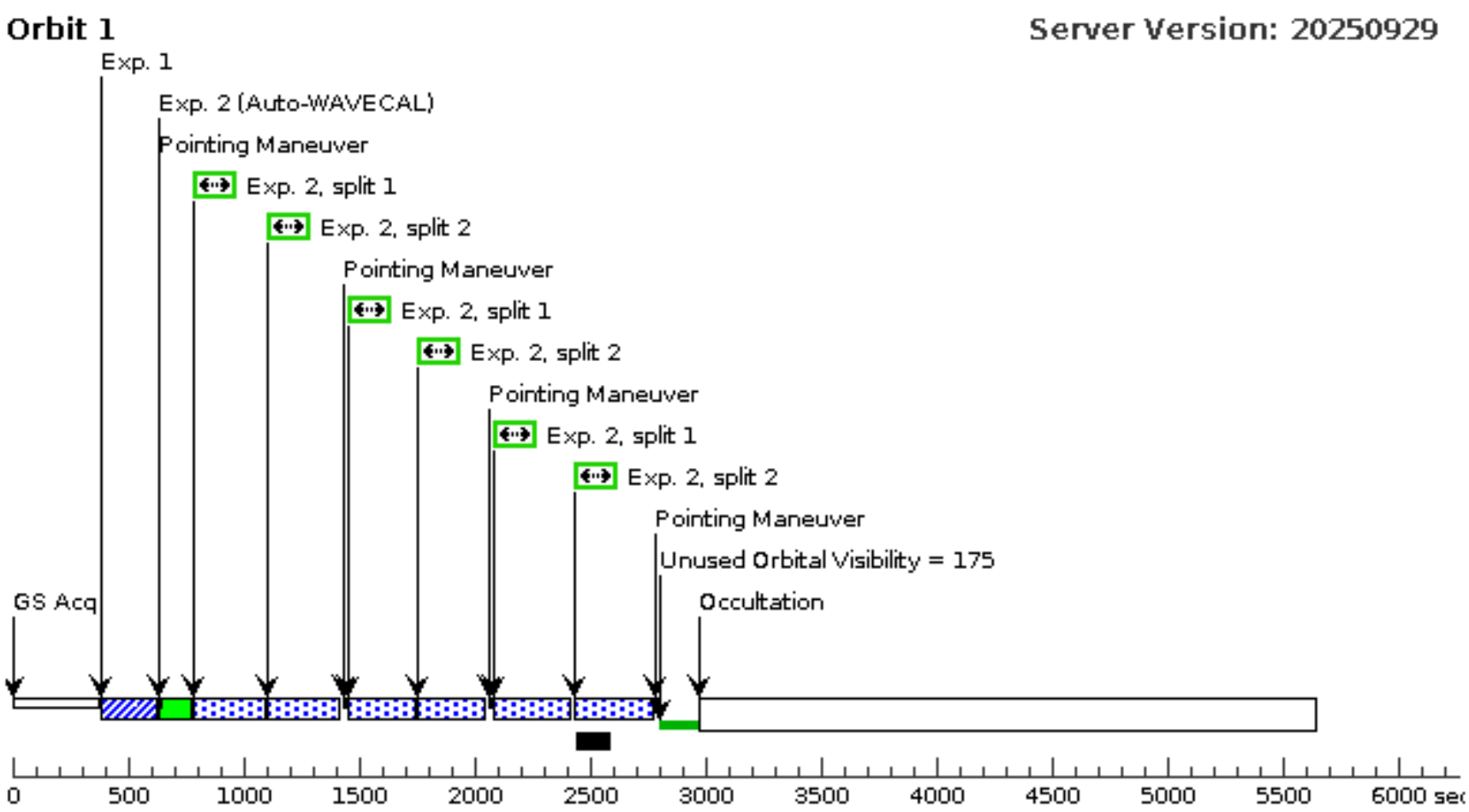
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	MCG-03-34-064	RA: 13 22 24.4583 (200.6019096d) Dec: -16 43 42.48 (-16.72847d) Equinox: J2000	Epoch of Position: 2000	V=14.9	Reference Frame: ICRS

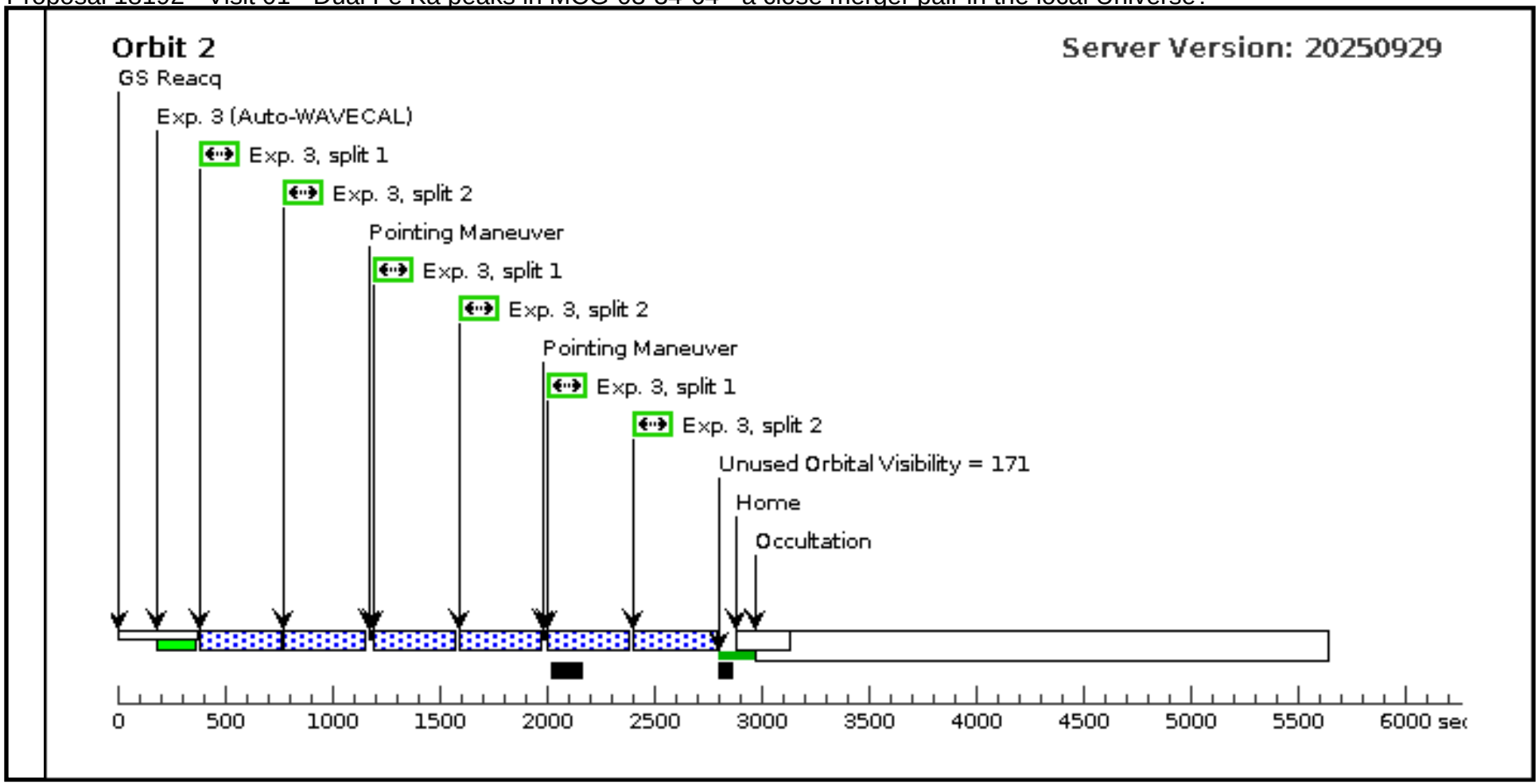
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=GALAXY
Description=[ACCRETION DISK, SEYFERT]
Extended=YES

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Acquisition	(1) MCG-03-34-064	STIS/CCD, ACQ, F28X50LP	MIRROR				3 Secs (3 Secs)	
								[==>]	***[1]***
2	G430L	(1) MCG-03-34-064	STIS/CCD, ACCUM, 52X0.2	G430L 4300 A			Pattern 1, Exps 2-2 in Visit 01 (1)	500 Secs (1670 Secs)	
								[==>275.0 Secs (Pattern 1, Split 1)]	***[1]***
								[==>275.0 Secs (Pattern 1, Split 2)]	
								[==>260.0 Secs (Pattern 2, Split 1)]	
								[==>260.0 Secs (Pattern 2, Split 2)]	
								[==>300.0 Secs (Pattern 3, Split 1)]	
								[==>300.0 Secs (Pattern 3, Split 2)]	
3	G430M	(1) MCG-03-34-064	STIS/CCD, ACCUM, 52X0.2	G430M 5093 A			Pattern 1, Exps 3-3 in Visit 01 (1)	500 Secs (2100 Secs)	
								[==>350.0 Secs (Pattern 1, Split 1)]	***[2]***
								[==>350.0 Secs (Pattern 1, Split 2)]	
								[==>350.0 Secs (Pattern 2, Split 1)]	
								[==>350.0 Secs (Pattern 2, Split 2)]	
								[==>350.0 Secs (Pattern 3, Split 1)]	
								[==>350.0 Secs (Pattern 3, Split 2)]	

Orbit Structure




Orbit 2
Server Version: 20250929
GS Reacq
Exp. 3 (Auto-WAVECAL)
Exp. 3, split 1
Exp. 3, split 2
Pointing Maneuver
Exp. 3, split 1
Exp. 3, split 2
Pointing Maneuver
Exp. 3, split 1
Exp. 3, split 2
Unused Orbital Visibility = 171
Home
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec