



14486 - Catching a Changing Look Quasar as it retreats to the Shadows for the Second Time

Cycle: 23, 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) MRK1018	COS/FUV COS/NUV	2	24-Feb-2016 21:10:29.0	yes

2 Total Orbits Used

ABSTRACT

We propose an urgent, exciting, and short observation of Mrk 1018, the first changing look quasar ever discovered to unambiguously undergo a full cyclical transformation, flickering from Type 2 (narrow lined), to Type 1 (broad lined), and back to Type 2 once more. The source first transitioned from a Seyfert 1.9 to a Seyfert 1 nucleus in 1984, and remained broad-lined for 29 years. Last week, in analyzing our new VLT/MUSE IFU data, we were astonished to discover that the source has transitioned **back** to a Seyfert 1.9, sometime between 2013 and now. This is the first time a quasar

has unambiguously gone "there and back again", and its second retreat to the shadows is not yet complete: the AGN has dimmed by a factor of 50-100 in *both* X-ray and optical since 2013, showing no signs of slowing. This extreme variability is due either to dramatic intermittency in the accretion rate, or because eclipsing clouds, which vacated our line of sight to reveal the broad line region in 1984, are occulting the broad line region once more. *Both* Chandra and HST are urgently needed to discriminate between these two hypotheses. A DDT is necessary because this event may be a very short-lived "flicker" (lasting mere months, rather than another year). With our Chandra DDT approved yesterday, we now require UV-through-NIR photometry with HST to (1) construct a clean pan-chromatic SED of the nucleus during this flicker event, (2) use Ly- α and UV continuum to constrain accretion models, and (3) map the circumnuclear environment on 80 pc scales, while the AGN is very dim. This is a short-lived chance to place simultaneous *temporal* and *physical* constraints on the Type 1 lifetime in a QSO.

OBSERVING DESCRIPTION

Standard two-orbit COS/FUV G140L observation of Markarian 1018, using the Primary Science Aperture. 150 sec ACQ/IMAGE observation to center on the UV photocentroid (the point source associated with the AGN). Four science exposures, spread over two orbits, are used to cycle through all four FP-POS positions.

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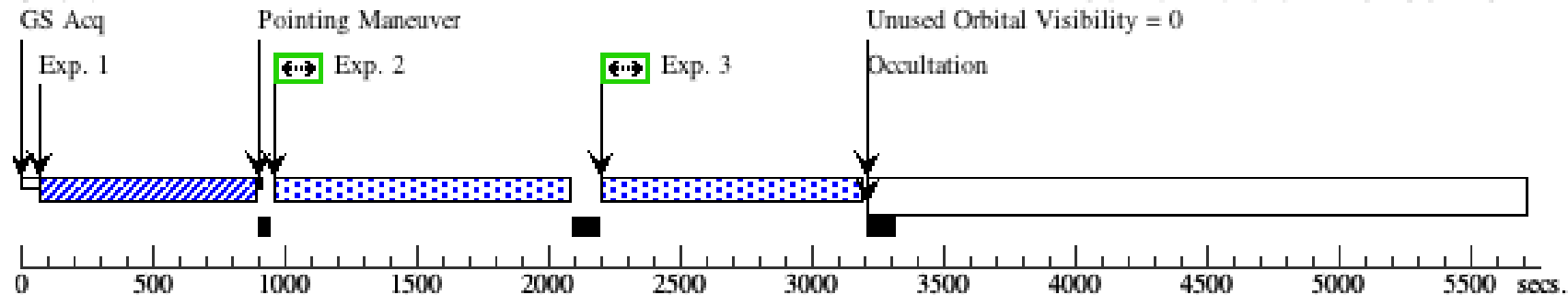
Visit	Proposal 14486, FUV-COS Mrk1018 (01), implementation Thu Feb 25 02:10:33 GMT 2016				
	Diagnostic Status: No Diagnostics Scientific Instruments: COS/FUV, COS/NUV Special Requirements: PCS MODE FINE; BEFORE 29-FEB-2016:10:30:36 <i>Comments: UV spectroscopy of Lyα and FUV continuum with COS of Mrk 1018 at the nucleus.</i>				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
	(1)	MRK1018 Alt Name1: UGC01597 Alt Name2: HE0203-0031	RA: 02 06 15.9888 (31.5666200d) Dec: -00 17 29.18 (-.29144d) Equinox: J2000	Redshift: 0.043	V=15.0+/-0.5 maximum continuum flux of 1.2 e-14erg/s/cm2/A at 1350A from IUE and HST/FOS spectroscopy during bright phase.
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i> Extended=NO					

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Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	Acquisition Exposure (A CQ/IMAGE) (774224)	(1) MRK1018	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				250 Secs (250 Secs) [==>]	[1]
	Comments: The exposure time for the acquisition is based on the assumption that the flux of the AGN nucleus has dropped by up to a factor 100 compared to the bright type 1 phase. We therefore set the exposure time so that the nucleus should be detected. If the source would be as bright as a few years ago the detector count limit would be exceeded by a factor of 3. However, recent ground-based u-band imaging obtained a week ago confirms that the u-band flux has dropped by several magnitudes compared to the original brightness between 1984 and 2012.									
	2	Science Exposure 1 (FP-POS=1) (774234)	(1) MRK1018	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=93 5; FLASH=YES; FP-POS=1; SEGMENT=A			2140 Secs (935 Secs) [==>935.0 Secs]	[1]
	Comments: ETC run is attached to verify the maximum count/rates expected if the source would be as bright as in the archival IUE and HST/FOS spectra. However, we suspect that the source has dropped by a factor of ~50-100 in the FUV. Buffer times and count rates should be perfectly fine in any case.									
	3	Science Exposure 2 (FP-POS=2) (774234)	(1) MRK1018	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=93 5; FLASH=YES; FP-POS=2; SEGMENT=A			2140 Secs (935 Secs) [==>935.0 Secs]	[1]
Comments: ETC run is attached to verify the maximum count/rates expected if the source would be as bright as in the archival IUE and HST/FOS spectra. However, we suspect that the source has dropped by a factor of ~50-100 in the FUV. Buffer times and count rates should be perfectly fine in any case.										
	4	Science Exposure 3 (FP-POS=3) (774241)	(1) MRK1018	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=13 70; FLASH=YES; FP-POS=3; SEGMENT=A			1370 Secs (1370 Secs) [==>1370.0 Secs]	[2]
	Comments: ETC run is attached to verify the maximum count/rates expected if the source would be as bright as in the archival IUE and HST/FOS spectra. However, we suspect that the source has dropped by a factor of ~50-100 in the FUV. Buffer times and count rates should be perfectly fine in any case.									
	5	Science Exposure 4 (FP-POS=4) (774140)	(1) MRK1018	COS/FUV, TIME-TAG, PSA	G140L 1105 A	BUFFER-TIME=13 70; FLASH=YES; FP-POS=4; SEGMENT=A			1350 Secs (1370 Secs) [==>1370.0 Secs]	[2]
Comments: ETC run is attached to verify the maximum count/rates expected if the source would be as bright as in the archival IUE and HST/FOS spectra. However, we suspect that the source has dropped by a factor of ~50-100 in the FUV. Buffer times and count rates should be perfectly fine in any case.										

Orbit 1

Server Version: 20160129



Orbit 2

Server Version: 20160129

