16900 - The first X-ray view of the extreme UV outflow quasar HE 0238-1904

Cycle: 29, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Emanuele Nardini (PI) (ESA Member) (Contact)	**Osservatorio Astrofisico di Arcetri**	**emanuele.nardini@inaf.it**
Dr. Susanna Bisogni (CoI) (ESA Member)	INAF - IASF Milano	susanna.bisogni@inaf.it
Dr. Elias Kammoun (CoI) (ESA Member)	Institut de Recherche en Astrophysique et Planetologie	ekammoun@umich.edu
Dr. Elisabeta Lusso (CoI) (ESA Member)	Universita di Firenze	elisabeta.lusso@unifi.it
Dr. Gabriele Matzeu (CoI) (ESA Member)	Universita di Bologna	gabriele.matzeu@unibo.it
Dr. Guido Risaliti (CoI) (ESA Member)	Universita di Firenze	guido.risaliti@unifi.it

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) HE0238-1904	COS/FUV	2	15-Aug-2022 15:00:29.0	yes
02	(1) HE0238-1904	COS/FUV	2	15-Aug-2022 15:00:31.0	yes

4 Total Orbits Used

ABSTRACT

We propose to observe with XMM-Newton (120 ks) and HST (2 orbits) the luminous quasar HE 0238-1904 (z=0.63), which is host to one of the best studied UV outflows to date. The inferred mass outflow rate and kinetic luminosity are typical of AGN where intense feedback is at work. HE 0238-1904 was detected in the XMM-Newton Slew Survey, but no X-ray spectrum of this exceptional object has ever been acquired with any major X-ray observatory. Our aim is to obtain for the first time high-quality X-ray data of HE 0238-1904, in order to understand the physical properties of its innermost regions, in terms of obscuration, intrinsic spectral shape, and possible presence of an X-ray counterpart to the UV wind. This observation

will allow us to shed new light on the link between efficient accretion, powerful winds, and AGN feedback.

OBSERVING DESCRIPTION

The key aims of this progam are to probe the current state of the UV wind in HE 0238-1904 (previously detected by COS in 2009) with a combination of G130M and G160M observations, and to determine the ionising photon budget by building an accurate spectral energy distribution from the UV to the X-rays (through the coordinated XMM-Newton observation).

Proposal 16900 - Visit 01 - The first X-ray view of the extreme UV outflow quasar HE 0238-1904

Visit

Proposal 16900, Visit 01, failed Mon Aug 15 19:00:32 GMT 2022

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: BETWEEN 21-JUL-2022 AND 29-JUL-2022

Comments: Coordinated observation with XMM-Newton. Simultaneity is desirable but not strictly required, as long as the HST and XMM-Newton visits can be scheduled within a period of 7-10 days. The overlapping visibility window between XMM-Newton cycle 21 and HST cycle 29 is July 1st to August 12th, 2022. The next XMM-Newton visibility window falls after the nominal end of HST cycle 29, between January 3rd and February 10th, 2023.

Diagnostics

(Visit 01) Warning (Form): For the best data quality, it is generally required to use all four FP-POS positions when observing at a given COS cenwave. See the COS Instrument Handbook for exceptions that may apply to observations with G130M/1291 or G160M.

Fixed Targets

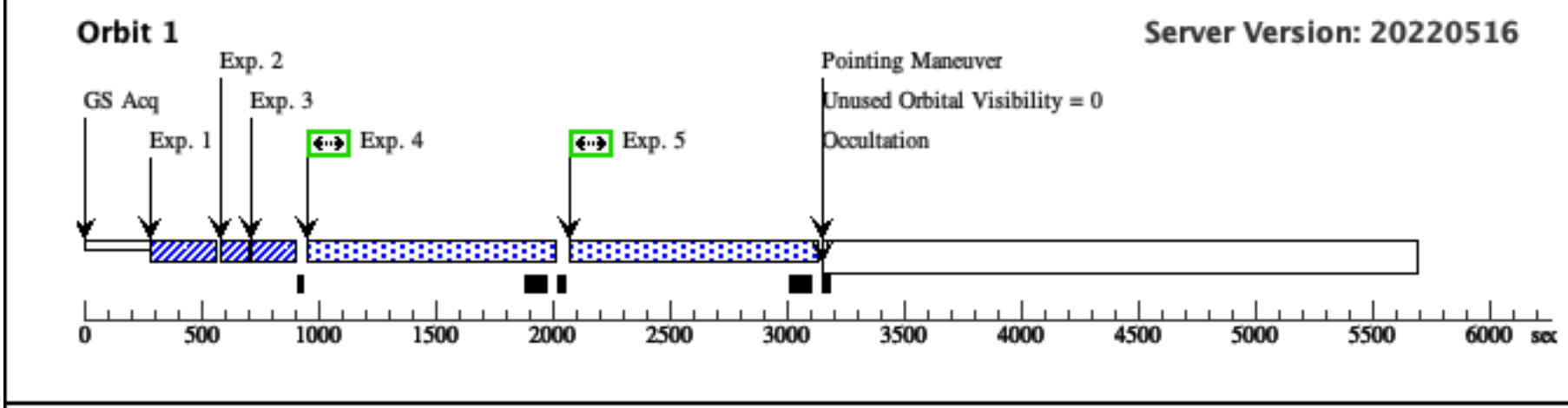
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HE0238-1904 Alt Name1: QSO-B0238-1904 Alt Name2: 2MASS-J02403258-1851512	RA: 02 40 32.5841 (40.1357671d) Dec: -18 51 51.37 (-18.86427d) Equinox: J2000	Proper Motion RA: -5.35425905680326E-6 sec of time/yr Proper Motion Dec: 1.71E-4 arcsec/yr Epoch of Position: 2015.5 Redshift: 0.63	V=15.0 1.5e-14 at 1300A, 1.5e-14 at 1500A, 1.5e-14 at 1750A	Reference Frame: ICRS

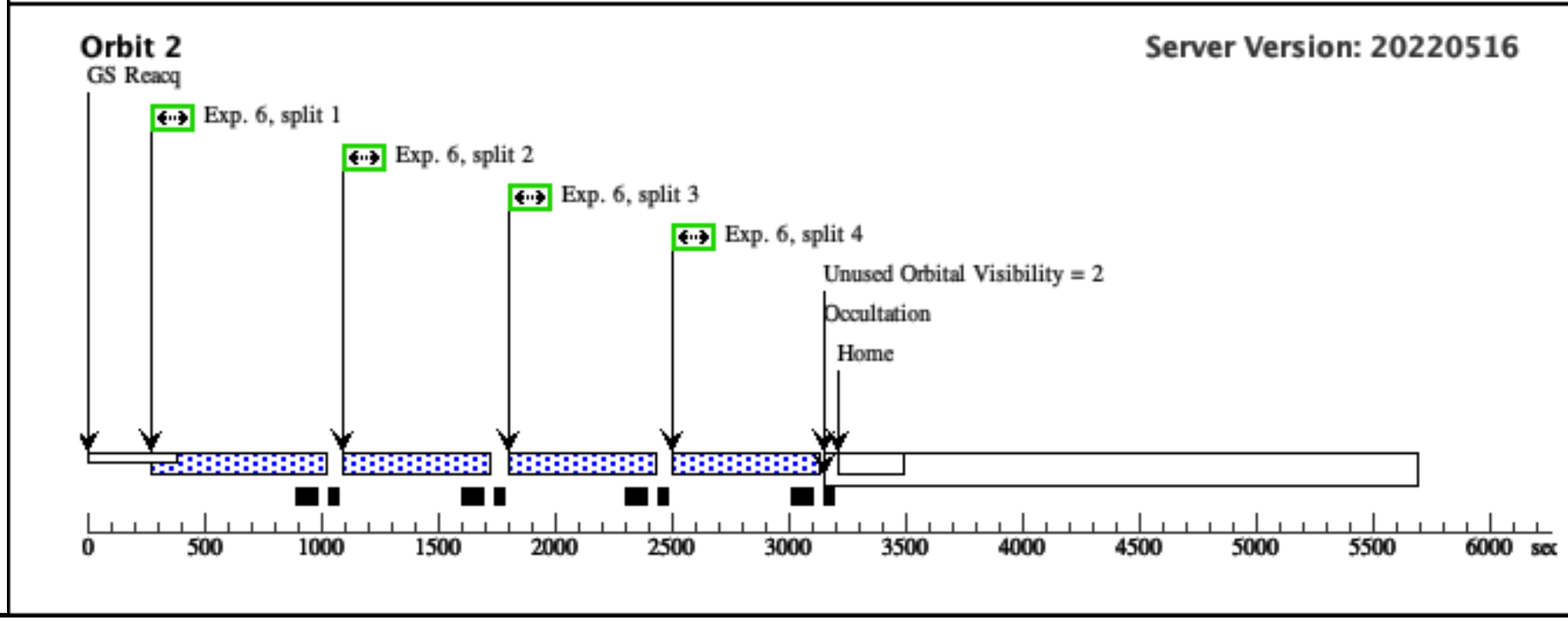
Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Fluxes (in erg/s/cm2/A) are taken from proposal ID 11541, datasets LB6804040, LB68040A0 and similar (LB68040xx). The observed continuum is approximately flat over the G130M+G160M range.
Category=GALAXY
Description=[QSO, WIND]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.sa.1684100)	(1) HE0238-1904	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	SCAN-SIZE=2			7 Secs (7 Secs) *[==>]*	 ***[1]***
	Comments: A flat F_lambda observed spectrum with a conservative flux of 1e-14 at 1310A is assumed based on archival data set LB6804040 (no reddening is therefore applied). COS.sa.1684100 gives S/N=40 in 6.8s, rounded to 7s.								
2	(COS.sa.1684100)	(1) HE0238-1904	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	NUM-POS=3; STEP-SIZE=1.3			7 Secs (7 Secs) *[==>]*	 ***[1]***
	Comments: A flat F_lambda observed spectrum with a conservative flux of 1e-14 at 1310A is assumed based on archival data set LB6804040 (no reddening is therefore applied). COS.sa.1684100 gives S/N=40 in 6.8s, rounded to 7s.								
3	(COS.sa.1684100)	(1) HE0238-1904	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	NUM-POS=5; STEP-SIZE=0.9			7 Secs (7 Secs) *[==>]*	 ***[1]***
	Comments: A flat F_lambda observed spectrum with a conservative flux of 1e-14 at 1310A is assumed based on archival data set LB6804040 (no reddening is therefore applied). COS.sa.1684100 gives S/N=40 in 6.8s, rounded to 7s.								
4	(COS.sp.1684599)	(1) HE0238-1904	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=902			1012 Secs (1012 Secs) *[==>]*	 ***[1]***
	Comments: A flat F_lambda observed spectrum with flux of 1.5e-14 at 1310A is assumed based on archival data set LB6804040 (no reddening is therefore applied). COS.sp.1684599 gives S/N=10 at 1310A in 1089s, with BFT=3278s. The two available FP-POS for G130M central wavelength 1291A are used, with single exposures of 1012s (FP-POS=3 in this exposure). A buffer-time of 902s (= Exp. time - 110s) is chosen to maxi mise science exposure.								
5	(COS.sp.1684599)	(1) HE0238-1904	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=902			1012 Secs (1012 Secs) *[==>]*	 ***[1]***
	Comments: A flat F_lambda observed spectrum with flux of 1.5e-14 at 1310A is assumed based on archival data set LB6804040 (no reddening is therefore applied). COS.sp.1684599 gives S/N=10 at 1310A in 1089s, with BFT=3278s. The two available FP-POS for G130M central wavelength 1291A are used, with single exposures of 1012s (FP-POS=4 in this exposure). A buffer-time of 902s (= Exp. time - 110s) is chosen to maxi mise science exposure.								
6	(COS.sp.1684600)	(1) HE0238-1904	COS/FUV, TIME-TAG, PSA	G160M 1589 A	FP-POS=ALL; BUFFER-TIME=471			581 Secs (2324 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]*	 ***[2]***
	Comments: A flat F_lambda observed spectrum with flux of 1.5e-14 at 1500A is assumed based on archival data set LB68040A0 (no reddening is therefore applied). COS.sp.1684600 gives S/N=10 at 1500A in 1231s, with BFT=6929s. All four FP-POS for G160M central wavelength 1589A are used, with single exposures of 581s. A buffer-time of 471s (= Exp. time - 110s) is chosen to maximise science exposure.								

Orbit Structure





Visit

Proposal 16900, visit 1 duplicate (02), implementation Mon Aug 15 19:00:32 GMT 2022

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: BETWEEN 21-JUL-2022 AND 30-SEP-2022

Comments: Coordinated observation with XMM-Newton. Simultaneity is desirable but not strictly required, as long as the HST and XMM-Newton visits can be scheduled within a period of 7-10 days. The overlapping visibility window between XMM-Newton cycle 21 and HST cycle 29 is July 1st to August 12th, 2022. The next XMM-Newton visibility window falls after the nominal end of HST cycle 29, between January 3rd and February 10th, 2023.

Diagnostics

(visit 1 duplicate (02)) Warning (Form): For the best data quality, it is generally required to use all four FP-POS positions when observing at a given COS cenwave. See the COS Instrument Handbook for exceptions that may apply to observations with G130M/1291 or G160M.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HE0238-1904 Alt Name1: QSO-B0238-1904 Alt Name2: 2MASS-J02403258-1851512	RA: 02 40 32.5841 (40.1357671d) Dec: -18 51 51.37 (-18.86427d) Equinox: J2000	Proper Motion RA: -5.35425905680326E-6 sec of time/yr Proper Motion Dec: 1.71E-4 arcsec/yr Epoch of Position: 2015.5 Redshift: 0.63	V=15.0 1.5e-14 at 1300A, 1.5e-14 at 1500A, 1.5e-14 at 1750A	Reference Frame: ICRS

Comments: This object was generated by the target selector and retrieved from the SIMBAD database.
Fluxes (in erg/s/cm2/A) are taken from proposal ID 11541, datasets LB6804040, LB68040A0 and similar (LB68040xx). The observed continuum is approximately flat over the G130M+G160M range.
Category=GALAXY
Description=[QSO, WIND]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.sa.1684100)	(1) HE0238-1904	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	SCAN-SIZE=2			7 Secs (7 Secs) *[==>]*	 ***[1]***
	Comments: A flat F_lambda observed spectrum with a conservative flux of 1e-14 at 1310A is assumed based on archival data set LB6804040 (no reddening is therefore applied). COS.sa.1684100 gives S/N=40 in 6.8s, rounded to 7s.								
2	(COS.sa.1684100)	(1) HE0238-1904	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	NUM-POS=3; STEP-SIZE=1.3			7 Secs (7 Secs) *[==>]*	 ***[1]***
	Comments: A flat F_lambda observed spectrum with a conservative flux of 1e-14 at 1310A is assumed based on archival data set LB6804040 (no reddening is therefore applied). COS.sa.1684100 gives S/N=40 in 6.8s, rounded to 7s.								
3	(COS.sa.1684100)	(1) HE0238-1904	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	NUM-POS=5; STEP-SIZE=0.9			7 Secs (7 Secs) *[==>]*	 ***[1]***
	Comments: A flat F_lambda observed spectrum with a conservative flux of 1e-14 at 1310A is assumed based on archival data set LB6804040 (no reddening is therefore applied). COS.sa.1684100 gives S/N=40 in 6.8s, rounded to 7s.								
4	(COS.sp.1684599)	(1) HE0238-1904	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=902			1012 Secs (1012 Secs) *[==>]*	 ***[1]***
	Comments: A flat F_lambda observed spectrum with flux of 1.5e-14 at 1310A is assumed based on archival data set LB6804040 (no reddening is therefore applied). COS.sp.1684599 gives S/N=10 at 1310A in 1089s, with BFT=3278s. The two available FP-POS for G130M central wavelength 1291A are used, with single exposures of 1012s (FP-POS=3 in this exposure). A buffer-time of 902s (= Exp. time - 110s) is chosen to maxi mise science exposure.								
5	(COS.sp.1684599)	(1) HE0238-1904	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=4; BUFFER-TIME=902			1012 Secs (1012 Secs) *[==>]*	 ***[1]***
	Comments: A flat F_lambda observed spectrum with flux of 1.5e-14 at 1310A is assumed based on archival data set LB6804040 (no reddening is therefore applied). COS.sp.1684599 gives S/N=10 at 1310A in 1089s, with BFT=3278s. The two available FP-POS for G130M central wavelength 1291A are used, with single exposures of 1012s (FP-POS=4 in this exposure). A buffer-time of 902s (= Exp. time - 110s) is chosen to maxi mise science exposure.								
6	(COS.sp.1684600)	(1) HE0238-1904	COS/FUV, TIME-TAG, PSA	G160M 1589 A	FP-POS=ALL; BUFFER-TIME=471			581 Secs (2324 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]*	 ***[2]***
	Comments: A flat F_lambda observed spectrum with flux of 1.5e-14 at 1500A is assumed based on archival data set LB68040A0 (no reddening is therefore applied). COS.sp.1684600 gives S/N=10 at 1500A in 1231s, with BFT=6929s. All four FP-POS for G160M central wavelength 1589A are used, with single exposures of 581s. A buffer-time of 471s (= Exp. time - 110s) is chosen to maximise science exposure.								

Orbit Structure