X-SHOOTER Exposure Time Calculator

X-SHOOTER Echelle Spectroscopy Mode Version P116 Description FAQ

Arm: VIS

Observing conditions:

- **Input flux distribution:**
  - Source type: **Blackbody**
  - Temperature: **6500 K**
  - Object Magnitude: **V** = **17** (Vega)
- **Spatial Distribution: Point Source**
- **Sky Conditions:**
  - ☐ **show sky model configuration details**
  - Moon FLI: **0.5**
  - Moon-target separation: **45** degrees
  - Airmass: **1.5**
  - Seeing: **0.8** arcsec
  - T category to use in phase 1: **50%**
  - PWV: **30** mm
  - Probability **> 95%** of realising the PWV ≤ 30 mm

Spectral Format X-Shooter VIS arm

Order	blaze wave (nm)	FSR range (nm)	FSR l Min (nm)	FSR l Max (nm)	start wav (nm)	end wav (nm)	TS range (nm)
16	1001.60	42.30	980.00	1022.30	970.70	1048.90	78.20
17	957.30	38.80	946.10	984.90	913.70	987.40	73.70
18	904.30	47.50	880.90	928.40	862.90	932.70	69.80
19	860.20	46.30	836.20	882.50	817.60	883.80	66.20
20	815.80	41.30	796.00	837.30	777.00	839.80	62.80
21	777.60	35.70	761.70	797.40	739.70	800.00	60.30
22	742.60	32.70	726.60	759.30	706.10	763.80	57.70
23	711.20	30.00	696.00	726.00	675.40	730.70	55.30
24	682.10	29.30	667.50	696.80	647.20	700.40	53.20
25	653.80	26.30	641.80	668.10	621.30	672.50	51.20
26	629.50	24.60	617.70	642.30	597.40	646.80	49.40
27	607.70	22.60	595.90	618.50	575.20	622.90	47.70
28	585.90	20.70	575.50	596.20	554.60	600.80	46.20
29	568.00	14.10	560.60	574.70	535.80	580.20	44.40
30	550.50	12.50	546.80	559.30	525.30	561.00	35.70

- **Image Quality: 0.983** arcsec at **λ = 600 nm (to be used for OB constraint set)**
  - ☐ show details of the IQ calculations at **λ = 600** nm
- **Image Quality: 0.95** arcsec at the central wavelength λ_c **= 711.5** nm of the **VIS** arm
  - ☐ show details of the IQ calculations at λ_c **= 711.5** nm

We remind users that:
- the Turbulence Category to be specified in Phase 1 should be the one derived for 500 nm.

- the reference value to be entered in the image quality constraint in Phase 2 refers to the wavelength 600nm.

- **Instrument setup:**
  - Slit Width: **0.4** arcsec
  - Slit transmission: **0.440331** (calculated with the pre-slit PSF FWHM = 0.807 arcsec)
  - Exposure time setup: **Texp × NEXP = 3000s × 1 = 3000 s**
  - Medium pixel scale in Y (spatial) direction: **0.15** arcsec/pix
  - Number of Spectral pixels in X (spectral) direction: **1** pix/bin
  - PSF extension (Number of pixels along Y over which the sky signal is integrated): **13** pix(s)
  - Slit_Width * Bin_Scale * PSF_Extension: **0.78** arcsec^2

- **Detector parameters:**
  - Mode: **slow**, gain:**high**, binning:**1x1**
  - Gain (conversion factor): **0.64 e-/ADU**
  - Readout noise: **3.4 e-**, dark current: **2.6 e-/h**
  - Saturation limit: **41900 e-**

☐ **Show detailed S/N formula**

Detected Counts X-Shooter VIS Arm

	FSR Min Wavelength					Blaze wavelength								FSR Max Wavelength				
Order	**Eff. (%)**	**Obj (e-/Texp)**	**Sky (e-/Texp)**	**Imax (e-/Texp)**	**S/N***	**lambda (nm)**	**bin size (nm)**	**Eff. (%)**	**Obj (e-/Texp)**	**Sky (e-/Texp)**	**Imax (e-/Texp)**	**S/N***	**Texp(s) for S/N*=30**	**Eff. (%)**	**Obj (e-/Texp)**	**Sky (e-/Texp)**	**Imax (e-/Texp)**	**S/N***
16	0.87	280	13.7	87	13	1001.60	0.02	1.7	490	47.9	1.5e+02	18	7.1e+03	0.86	224	55.1	73	10
17	2.9	840	70.3	2.6e+02	25	957.30	0.018	5.7	1.56e+03	148	4.9e+02	36	2.2e+03	2.8	659	121	2.1e+02	21
18	4.6	1.47e+03	115	4.6e+02	35	904.30	0.017	9.1	2.54e+03	223	8e+02	47	1.3e+03	4.5	1.07e+03	117	3.4e+02	29
19	5	1.62e+03	124	5.1e+02	37	860.20	0.016	10	2.81e+03	231	8.9e+02	50	1.2e+03	5	1.19e+03	104	3.8e+02	31
20	5.3	1.71e+03	129	5.4e+02	38	815.80	0.015	11	2.95e+03	235	9.3e+02	51	1.1e+03	5.4	1.38e+03	115	4.3e+02	34
21	5.5	1.76e+03	132	5.5e+02	39	777.60	0.015	11	3.23e+03	247	1e+03	53	1e+03	5.5	1.37e+03	108	4.3e+02	34
22	5.6	1.74e+03	133	5.5e+02	38	742.60	0.014	11	3.18e+03	245	1e+03	53	1e+03	5.7	1.48e+03	113	4.6e+02	35
23	5.5	1.65e+03	132	5.2e+02	37	711.20	0.013	11	3.04e+03	232	9.5e+02	52	1.1e+03	5.6	1.39e+03	106	4.4e+02	34
24	4.9	1.52e+03	116	4.8e+02	36	682.10	0.013	10	2.81e+03	212	8.8e+02	50	1.2e+03	4.9	1.27e+03	91.7	4e+02	32
25	4.7	1.38e+03	111	4.3e+02	34	653.80	0.012	9.6	2.56e+03	194	8.1e+02	47	1.3e+03	4.9	1.17e+03	87.5	3.7e+02	31
26	4.2	1.23e+03	103	3.9e+02	32	629.50	0.012	8.4	2.28e+03	179	7.2e+02	44	1.5e+03	4.3	1.05e+03	75.6	3.3e+02	29
27	3.8	1.05e+03	96.2	3.3e+02	29	607.70	0.011	7.7	1.93e+03	160	6.1e+02	41	1.7e+03	3.9	971	75.5	3.1e+02	28
28	3.3	901	79.3	2.8e+02	26	585.90	0.011	6.5	1.66e+03	145	5.2e+02	37	2e+03	3.3	759	60.5	2.4e+02	24
29	3.3	827	115	2.6e+02	25	568.00	0.011	6.5	1.65e+03	148	5.2e+02	37	2e+03	3.3	751	66.2	2.4e+02	24
30	0	0	0	0	0	550.50	0.01	1.1	246	22.7	77	12	1.5e+04	0.54	111	2.84	35	6.5

* *The S/N is per spectral bin. The signals **Obj**, **Sky** and **Imax** refer to one exposure (Texp) but the **S/N** refers to all exposures (Texp*NEXP).*
*For point sources, **Eff** refers to the total efficiency including the slit loss and atmospheric transmission.*

***Warning:** Please be aware that without a waiver there is a one-hour execution time limit for Service Mode OBs, and that the times returned here **do not** include instrument overheads, times for sky measurements, etc. Thus, care must be taken to allow for these additional times when constructing compliant OBs.*
