ESPRESSO Exposure Time Calculator

Optical Echelle Spectroscopy Mode Version P116 Description FAQ

Arm: RED

Observing conditions:

- **Telescope Setup: 4UTs**
- **Mode: multi MR 4x2 slow**
- **Input flux distribution:**
  - Source type: **Blackbody**
  - Temperature: **3600 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 Red Arm

Order	wav of central column (nm)	y of central column (pix)	y of central column (arcsec)	FSR range (nm)	FSR l Min (nm)	FSR l Max (nm)	start wav (nm)	end wav (nm)	TS range (nm)
78	784.45	1143	114	10.06	779.45	789.51	778.89	790.56	11.67
79	774.52	1374	137	9.80	769.65	779.45	769.02	780.56	11.54
80	764.84	1598	160	9.56	760.09	769.65	759.40	770.81	11.41
81	755.40	1816	182	9.33	750.76	760.09	750.02	761.30	11.28
82	746.19	2028	203	9.10	741.66	750.76	740.87	752.02	11.15
83	737.19	2233	223	8.88	732.78	741.66	731.93	742.96	11.03
84	728.42	2433	243	8.67	724.11	732.78	723.21	734.12	10.91
85	719.85	2627	263	8.47	715.64	724.11	714.70	725.49	10.79
86	711.48	2816	282	8.27	707.37	715.64	706.38	717.06	10.67
87	703.30	2999	300	8.08	699.28	707.37	698.26	708.82	10.56
88	695.31	3178	318	7.90	691.38	699.28	690.32	700.77	10.45
89	687.50	3353	335	7.72	683.66	691.38	682.56	692.90	10.34
90	679.86	3523	352	7.55	676.10	683.66	674.97	685.20	10.23
91	672.39	3688	369	7.39	668.71	676.10	667.55	677.67	10.12
92	665.08	3850	385	7.23	661.48	668.71	660.29	670.31	10.02
93	657.93	4007	401	7.07	654.41	661.48	653.19	663.10	9.91
94	650.93	4161	416	6.92	647.48	654.41	646.24	656.05	9.81
95	644.08	4311	431	6.78	640.70	647.48	639.43	649.15	9.71
96	637.37	4458	446	6.64	634.06	640.70	632.77	642.39	9.62

97	630.80	4601	460	6.50	627.56	634.06	626.24	635.77	9.52
98	624.36	4741	474	6.37	621.19	627.56	619.85	629.28	9.43
99	618.05	4877	488	6.24	614.95	621.19	613.59	622.92	9.34
100	611.87	5011	501	6.12	608.83	614.95	607.45	616.70	9.25
101	605.81	5141	514	6.00	602.83	608.83	601.43	610.59	9.16
102	599.87	5269	527	5.88	596.95	602.83	595.53	604.61	9.07
103	594.05	5394	539	5.77	591.18	596.95	589.75	598.74	8.99
104	588.34	5516	552	5.66	585.52	591.18	584.08	592.98	8.90
105	582.74	5636	564	5.55	579.97	585.52	578.51	587.34	8.82
106	577.24	5753	575	5.45	574.53	579.97	573.06	581.80	8.74
107	571.84	5868	587	5.34	569.18	574.53	567.70	576.36	8.66
108	566.55	5980	598	5.25	563.94	569.18	562.44	571.02	8.58
109	561.35	6090	609	5.15	558.79	563.94	557.28	565.79	8.51
110	556.25	6197	620	5.06	553.73	558.79	552.21	560.64	8.43
111	551.24	6303	630	4.97	548.76	553.73	547.23	555.59	8.36
112	546.31	6406	641	4.88	543.89	548.76	542.35	550.63	8.29
113	541.48	6507	651	4.79	539.09	543.89	537.55	545.76	8.22
114	536.73	6607	661	4.71	534.39	539.09	532.83	540.98	8.15
115	532.06	6704	670	4.63	529.76	534.39	528.19	536.27	8.08
116	527.48	6799	680	4.55	525.21	529.76	523.64	531.65	8.01
117	522.97	6893	689	4.47	520.74	525.21	519.16	527.11	7.94

- **Image Quality: 0.87** arcsec at **λ = 600 nm (to be used for OB constraint set)**
  ☐ show details of the IQ calculations at **λ = 600** nm

- **Image Quality: 0.852** arcsec at the central wavelength **λ_c = 650** nm of the **RED** arm
  ☐ show details of the IQ calculations at **λ_c = 650** 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:**
  - ESPRESSO **fiber feed** used
  - Fiber diameter: **1** arcsec
  - Fiber entrance loss: **48.2** %
  - Exposure time: **3000 s**
  - Medium pixel scale in Y (spatial) direction: **0.1** arcsec/pix
  - Spatial (Y) bin size: **4** unbinned pixels/bin
  - Spectral (X) bin size: **2** unbinned pixels/bin
  - Digital pixel size in velocity: **0.5** km/s
  - The sky signal is integrated over : **40** unbinned spatial pixels (10 spatial bins)
  - Effective sky aperture: **4** arcsec^2

- **Detector parameters:**
  - Mode: **slow**, gain:**high**, binning:**4x2**
  - Gain (conversion factor): **1.1 e-/ADU**
  - Readout noise: **2 e-**, dark current: **2 e-/h**
  - Saturation limit: **72090 e-**
  - Linearity limit: **60500 e-**

☐ **Show detailed S/N formula**

Detected Counts Red Arm

	FSR Min Wavelength					Wavelength of central column								FSR Max Wavelength				
Order	**Eff. (%)**	**Obj (e-)**	**Sky (e-)**	**Imax (e-)**	**S/N***	**lambda (nm)**	**bin size (nm)**	**Eff. (%)**	**Obj (e-)**	**Sky (e-)**	**Imax (e-)**	**S/N***	**Texp(s) for S/N*=50**	**Eff. (%)**	**Obj (e-)**	**Sky (e-)**	**Imax (e-)**	**S/N***

78	1.8	1.04e+03	56.1	4.2e+02	29	784.45	0.0026	3.5	1.81e+03	93	7.2e+02	40	4.7e+03	0	0	0	0	0
79	1.7	959	41.8	3.8e+02	28	774.52	0.0026	3.3	1.66e+03	84.9	6.7e+02	38	5.2e+03	1.7	671	34.2	2.7e+02	23
80	2.2	1.21e+03	60.1	4.9e+02	32	764.84	0.0025	4.4	2.11e+03	107	8.5e+02	43	4e+03	2.2	854	48.5	3.4e+02	26
81	2.3	1.22e+03	59.2	4.9e+02	32	755.40	0.0025	4.6	2.14e+03	108	8.6e+02	43	4e+03	2.3	874	45.3	3.5e+02	26
82	2.4	1.25e+03	64.3	5e+02	32	746.19	0.0025	4.8	2.19e+03	111	8.8e+02	44	3.9e+03	2.4	900	46.7	3.6e+02	27
83	2.4	1.19e+03	60.3	4.8e+02	32	737.19	0.0024	4.7	2.08e+03	106	8.3e+02	43	4.1e+03	2.4	853	43.2	3.4e+02	26
84	2.4	1.2e+03	55.3	4.8e+02	32	728.42	0.0024	4.9	2.09e+03	106	8.4e+02	43	4e+03	2.4	859	44.8	3.4e+02	26
85	2.8	1.34e+03	68.6	5.4e+02	34	719.85	0.0024	5.6	2.35e+03	118	9.4e+02	46	3.6e+03	2.8	969	51.8	3.9e+02	28
86	2.7	1.25e+03	63.6	5e+02	32	711.48	0.0024	5.4	2.2e+03	111	8.8e+02	44	3.8e+03	2.7	913	45.5	3.7e+02	27
87	2.7	1.18e+03	61.3	4.7e+02	31	703.30	0.0023	5.3	2.09e+03	106	8.4e+02	43	4.1e+03	2.7	870	43.8	3.5e+02	26
88	2.6	1.13e+03	55.5	4.5e+02	31	695.31	0.0023	5.2	1.99e+03	102	8e+02	42	4.3e+03	2.6	829	42.3	3.3e+02	26
89	2.8	1.18e+03	59.3	4.7e+02	31	687.50	0.0023	5.6	2.08e+03	106	8.3e+02	43	4.1e+03	2.8	865	45.4	3.5e+02	26
90	2.9	1.16e+03	58.4	4.6e+02	31	679.86	0.0022	5.7	2.05e+03	104	8.2e+02	42	4.1e+03	2.9	857	43.9	3.4e+02	26
91	2.9	1.12e+03	58.5	4.5e+02	30	672.39	0.0022	5.8	1.99e+03	101	8e+02	42	4.3e+03	2.9	836	42.5	3.4e+02	26
92	2.8	1.06e+03	50.8	4.3e+02	30	665.08	0.0022	5.6	1.89e+03	97	7.6e+02	41	4.5e+03	2.8	797	41	3.2e+02	25
93	3.1	1.14e+03	62	4.6e+02	31	657.93	0.0022	6.3	2.04e+03	106	8.2e+02	42	4.2e+03	3.2	865	46.5	3.5e+02	26
94	2.9	1.03e+03	54.4	4.1e+02	29	650.93	0.0022	5.9	1.84e+03	96.5	7.4e+02	40	4.6e+03	2.9	781	39.7	3.1e+02	25
95	2.9	982	52.8	3.9e+02	28	644.08	0.0021	5.8	1.76e+03	93.4	7e+02	39	4.9e+03	2.9	748	39.4	3e+02	24
96	2.9	940	50.9	3.8e+02	28	637.37	0.0021	5.8	1.68e+03	91.2	6.7e+02	38	5.1e+03	2.9	717	38.5	2.9e+02	24
97	2.9	930	52.3	3.7e+02	27	630.80	0.0021	5.9	1.67e+03	93.3	6.7e+02	38	5.2e+03	3	713	39.9	2.9e+02	23
98	3	905	54	3.6e+02	27	624.36	0.0021	6	1.62e+03	93.8	6.5e+02	37	5.3e+03	3	696	39.7	2.8e+02	23
99	2.9	845	51.1	3.4e+02	26	618.05	0.002	5.8	1.52e+03	90.5	6.1e+02	36	5.7e+03	2.9	652	37.8	2.6e+02	22
100	2.9	813	50.5	3.3e+02	25	611.87	0.002	5.7	1.46e+03	89.9	5.9e+02	35	6e+03	2.9	629	38.2	2.5e+02	22
101	2.9	784	51	3.1e+02	25	605.81	0.002	5.8	1.41e+03	89.6	5.7e+02	34	6.2e+03	2.9	609	38	2.4e+02	21
102	2.8	737	49.6	3e+02	24	599.87	0.002	5.6	1.33e+03	87.1	5.3e+02	33	6.7e+03	2.8	575	36.7	2.3e+02	21
103	2.8	704	46.5	2.8e+02	23	594.05	0.002	5.6	1.27e+03	86	5.1e+02	32	7e+03	2.8	551	36.9	2.2e+02	20
104	2.9	713	52.5	2.9e+02	23	588.34	0.0019	5.9	1.29e+03	90.1	5.2e+02	33	6.9e+03	2.9	560	39	2.2e+02	20
105	2.7	645	46.9	2.6e+02	22	582.74	0.0019	5.5	1.17e+03	84.2	4.7e+02	31	7.7e+03	2.8	508	35.3	2e+02	19
106	2.8	630	47.4	2.5e+02	22	577.24	0.0019	5.6	1.14e+03	84.5	4.6e+02	30	7.9e+03	2.8	494	36.4	2e+02	19
107	2.8	606	46.9	2.4e+02	21	571.84	0.0019	5.6	1.1e+03	83.7	4.4e+02	30	8.3e+03	2.8	477	35.9	1.9e+02	18
108	2.8	580	46.7	2.3e+02	21	566.55	0.0019	5.5	1.05e+03	82.5	4.2e+02	29	8.7e+03	2.8	458	35.3	1.8e+02	18
109	2.7	545	45.5	2.2e+02	20	561.35	0.0019	5.4	988	79.7	4e+02	28	9.3e+03	2.7	432	33.9	1.7e+02	17
110	2.6	504	42.6	2e+02	19	556.25	0.0018	5.2	917	76.3	3.7e+02	27	1e+04	2.6	402	32.5	1.6e+02	16
111	2.6	480	42.9	1.9e+02	18	551.24	0.0018	5.2	874	75.1	3.5e+02	26	1.1e+04	2.6	384	32.3	1.5e+02	16
112	2.4	439	40.3	1.8e+02	17	546.31	0.0018	4.9	800	71.1	3.2e+02	25	1.2e+04	2.5	352	30.1	1.4e+02	15
113	2.4	406	38.6	1.6e+02	16	541.48	0.0018	4.7	741	68	3e+02	24	1.3e+04	2.4	327	29	1.3e+02	14
114	2.2	368	37.9	1.5e+02	15	536.73	0.0018	4.4	671	63.7	2.7e+02	22	1.5e+04	2.2	296	26.7	1.2e+02	13
115	1.7	267	50.1	1.1e+02	12	532.06	0.0018	3.4	488	47.8	2e+02	18	2.1e+04	1.7	216	16.9	87	11
116	0.67	103	4.87	41	6.1	527.48	0.0017	1.4	188	19.1	76	9.7	7.2e+04	0.68	83.5	6.33	34	5.1
117	2.4	356	37.4	1.4e+02	15	522.97	0.0017	4.9	652	68.3	2.6e+02	22	1.5e+04	2.4	289	49.5	1.2e+02	13

[*] *The S/N is per spectral bin. For point sources,* ***Eff*** *refers to the total efficiency including the fiber entrance 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.*

Arm: BLUE

Observing conditions:

- **Telescope Setup: 4UTs**
- **Mode: multi MR 4x2 slow**
- **Input flux distribution:**
  - Source type: **Blackbody**
  - Temperature: **3600 K**
  - Object Magnitude: **V** = **17** (Vega)