UVES Exposure Time Calculator

Optical Echelle Spectroscopy Mode Version P116 Description FAQ

Red Arm, CD3

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

Detector: MIT

Spectral Format Red, CD#3

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)
87	701.93	2035	370	8.06	697.23	705.29	695.51	707.05	11.53
88	693.96	1871	341	7.88	689.36	697.23	687.61	699.02	11.41
89	686.16	1712	312	7.70	681.65	689.36	679.88	691.17	11.28
90	678.54	1555	283	7.53	674.12	681.65	672.33	683.49	11.16
91	671.09	1402	255	7.37	666.75	674.12	664.94	675.98	11.04
92	663.80	1253	228	7.21	659.55	666.76	657.72	668.64	10.92
93	656.66	1107	201	7.05	652.49	659.55	650.64	661.45	10.81
94	649.68	964	175	6.90	645.59	652.49	643.72	654.42	10.70
95	642.84	824	150	6.76	638.83	645.59	636.95	647.53	10.59
96	636.15	687	125	6.62	632.21	638.83	630.31	640.79	10.48
97	629.59	552	101	6.48	625.73	632.21	623.81	634.19	10.38
98	623.17	421	77	6.35	619.37	625.73	617.45	627.72	10.27

99	616.87	292	53	6.22	613.15	619.37	611.21	621.38	10.17
100	610.71	166	30	6.10	607.05	613.15	605.10	615.17	10.07
101	604.66	42	8	5.98	601.07	607.05	599.11	609.08	9.98

- **Image Quality: 0.866** arcsec at the central wavelength λ_c **= 600** nm **(to be used for OB constraint set)**
  - ☐ show details of the IQ calculations at λ_c **= 600** nm

- **Instrument setup:**
  - Pre slit filter: **comp/filt/nofilter.dat**
  - Image slicer: **None**
  - Slit Width: **0.5** arcsec
  - Slit transmission: **0.513191** (calculated with the pre-slit PSF FWHM = 0.847 arcsec)
  - Observation Mode:**STANDARD** Template.
  - Dichroic selection: **None**
  - Arm cross disperser combination: **Red, CD#3**
  - Below slit filter: **ins/uves/filt/flt_red_BS4-SHP700.dat**
  - Exposure time: **3000 s**
  - Medium pixel scale in Y (spatial) direction: **0.182** 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): **10** pix(s)
  - Slit_Width * Bin_Scale * PSF_Extension: **0.91** arcsec^2

- **Detector parameters:**
  - Mode: **fast**, gain:**low**, binning:**1x1**
  - Gain (conversion factor): **1.41 e-/ADU**
  - Readout noise: **3.71 e-**, dark current: **0.6 e-/h**
  - Saturation limit: **92400 e-**

☐ **Show detailed S/N formula**

Detected Counts

	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*=30**	**Eff. (%)**	**Obj (e-)**	**Sky (e-)**	**Imax (e-)**	**S/N***
87	2.7	189	22.2	66	10	701.93	0.0028	5.4	322	37.9	1.1e+02	14	1.1e+04	2.7	138	16.3	48	8
88	2.6	183	20.9	64	9.8	693.96	0.0028	5.2	312	35.6	1.1e+02	14	1.1e+04	2.6	133	15.2	46	7.8
89	2.6	180	19.6	62	9.7	686.16	0.0028	5.1	307	34	1.1e+02	14	1.1e+04	2.6	131	14.7	46	7.7
90	2.6	179	18.8	62	9.7	678.54	0.0027	5.2	308	33.1	1.1e+02	14	1.1e+04	2.6	132	14.5	46	7.8
91	2.6	182	18.4	63	9.8	671.09	0.0027	5.3	314	33.1	1.1e+02	14	1.1e+04	2.7	136	14.6	47	7.9
92	2.8	189	18.8	66	10	663.80	0.0027	5.5	326	33.7	1.1e+02	15	1e+04	2.8	141	15	49	8.2
93	2.9	195	19.2	67	10	656.66	0.0026	5.7	337	34.2	1.2e+02	15	9.9e+03	2.9	146	15.2	51	8.4
94	2.9	199	19.2	69	10	649.68	0.0026	5.9	344	34.3	1.2e+02	15	9.7e+03	3	150	15.3	52	8.5
95	3	204	19.6	71	11	642.84	0.0026	6.1	354	34.8	1.2e+02	15	9.4e+03	3.1	154	15.5	54	8.7
96	3.1	209	20	72	11	636.15	0.0026	6.3	362	35.4	1.3e+02	16	9.2e+03	3.1	158	15.7	55	8.9
97	3.2	213	20.7	74	11	629.59	0.0025	6.4	369	36.3	1.3e+02	16	9e+03	3.2	162	16.1	56	9
98	3.2	214	21	74	11	623.17	0.0025	6.5	372	36.6	1.3e+02	16	9e+03	3.3	163	16.2	57	9.1
99	3.2	212	21.1	74	11	616.87	0.0025	6.5	369	36.5	1.3e+02	16	9e+03	3.3	163	16	56	9.1
100	3.2	209	20.8	72	11	610.71	0.0025	6.5	363	36	1.3e+02	16	9.2e+03	3.2	160	15.8	55	9
101	3.2	205	20.5	71	11	604.66	0.0024	6.4	357	35.5	1.2e+02	15	9.4e+03	3.2	158	15.6	55	8.9

* *The S/N is per spectral bin. 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.*

Detector: EEV

Spectral Format Red, CD#3

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)
103	592.93	1952	355	5.75	589.45	595.20	587.47	597.26	9.79
104	587.23	1836	334	5.64	583.81	589.45	581.82	591.52	9.70
105	581.63	1721	313	5.53	578.28	583.81	576.28	585.89	9.61
106	576.15	1609	293	5.43	572.85	578.28	570.84	580.37	9.53
107	570.77	1499	273	5.33	567.52	572.85	565.51	574.95	9.44
108	565.48	1391	253	5.23	562.29	567.52	560.27	569.63	9.36
109	560.30	1285	234	5.14	557.16	562.29	555.13	564.40	9.28
110	555.20	1181	215	5.04	552.11	557.16	550.08	559.27	9.20
111	550.20	1079	196	4.95	547.16	552.11	545.12	554.24	9.12
112	545.29	979	178	4.86	542.30	547.16	540.25	549.29	9.04
113	540.47	881	160	4.78	537.52	542.30	535.47	544.44	8.96
114	535.73	784	143	4.69	532.83	537.52	530.77	539.66	8.89
115	531.07	689	125	4.61	528.21	532.83	526.16	534.97	8.82
116	526.49	596	108	4.53	523.68	528.21	521.62	530.36	8.74
117	522.00	504	92	4.46	519.22	523.68	517.16	525.83	8.67
118	517.57	414	75	4.38	514.84	519.22	512.77	521.38	8.61
119	513.23	326	59	4.31	510.53	514.84	508.46	517.00	8.54
120	508.95	239	43	4.24	506.30	510.53	504.23	512.70	8.47
121	504.74	154	28	4.17	502.13	506.30	500.06	508.46	8.41
122	500.61	70	13	4.10	498.03	502.13	495.96	504.30	8.34

- **Image Quality: 0.866** arcsec at the central wavelength λ_c **= 600** nm **(to be used for OB constraint set)**
  - ☐ show details of the IQ calculations at λ_c **= 600** nm

- **Instrument setup:**
  - Pre slit filter: **comp/filt/nofilter.dat**
  - Image slicer: **None**
  - Slit Width: **0.5** arcsec
  - Slit transmission: **0.513191** (calculated with the pre-slit PSF FWHM = 0.847 arcsec)
  - Observation Mode:**STANDARD** Template.
  - Dichroic selection: **None**
  - Arm cross disperser combination: **Red, CD#3**
  - Below slit filter: **ins/uves/filt/flt_red_BS4-SHP700.dat**
  - Exposure time: **3000 s**
  - Medium pixel scale in Y (spatial) direction: **0.182** 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): **10** pix(s)
  - Slit_Width * Bin_Scale * PSF_Extension: **0.91** arcsec^2

- **Detector parameters:**
  - Mode: **fast**, gain:**low**, binning:**1x1**

- Gain (conversion factor): **1.47 e-/ADU**
- Readout noise: **4.18 e-**, dark current: **0.4 e-/h**
- Saturation limit: **96337 e-**

☐ **Show detailed S/N formula**

Detected Counts

	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*=30**	**Eff. (%)**	**Obj (e-)**	**Sky (e-)**	**Imax (e-)**	**S/N***
103	3.3	207	20.9	72	10	592.93	0.0024	6.6	361	36.2	1.3e+02	15	9.4e+03	3.3	160	16	56	8.5
104	3.2	203	20.4	70	10	587.23	0.0024	6.5	354	35.6	1.2e+02	15	9.6e+03	3.2	157	15.7	55	8.4
105	3.2	199	20.3	69	10	581.63	0.0024	6.4	348	35.1	1.2e+02	15	9.8e+03	3.2	155	15.6	54	8.3
106	3.1	194	19.9	67	9.8	576.15	0.0023	6.3	338	34.1	1.2e+02	14	1e+04	3.1	150	15.1	52	8.1
107	3.1	187	18.9	65	9.5	570.77	0.0023	6.1	326	32.9	1.1e+02	14	1e+04	3.1	145	14.5	50	7.9
108	3	184	18.6	64	9.4	565.48	0.0023	6.1	322	32.4	1.1e+02	14	1.1e+04	3	144	14.5	50	7.8
109	3	182	18.3	63	9.3	560.30	0.0023	6.1	319	32.1	1.1e+02	14	1.1e+04	3	143	14.3	49	7.8
110	3	178	18.1	62	9.2	555.20	0.0022	6	313	31.6	1.1e+02	14	1.1e+04	3	141	14.1	49	7.7
111	3	175	17.7	61	9.1	550.20	0.0022	6	307	31.2	1.1e+02	14	1.1e+04	3	138	14	48	7.6
112	3	173	17.6	60	9	545.29	0.0022	6	304	31	1.1e+02	13	1.1e+04	3	137	14	48	7.6
113	3	171	17.5	59	8.9	540.47	0.0022	6	301	30.8	1e+02	13	1.1e+04	3	136	13.9	47	7.5
114	3	169	17.4	59	8.8	535.73	0.0022	6	298	30.6	1e+02	13	1.1e+04	3	135	13.8	47	7.4
115	3	166	17.2	58	8.7	531.07	0.0022	5.9	293	30.2	1e+02	13	1.2e+04	3	133	13.6	46	7.4
116	2.9	163	17	57	8.6	526.49	0.0021	5.9	288	29.9	1e+02	13	1.2e+04	2.9	131	13.5	45	7.3
117	2.9	160	16.8	55	8.5	522.00	0.0021	5.8	282	29.4	98	13	1.2e+04	2.9	128	13.3	44	7.2
118	2.9	156	16.4	54	8.3	517.57	0.0021	5.8	276	28.8	96	13	1.2e+04	2.9	125	13	43	7
119	2.8	152	16.1	53	8.2	513.23	0.0021	5.7	270	28.4	94	12	1.3e+04	2.8	123	12.9	43	6.9
120	2.8	150	15.8	52	8.1	508.95	0.0021	5.7	265	28	92	12	1.3e+04	2.8	121	12.7	42	6.8
121	2.8	149	15.7	52	8	504.74	0.0021	5.7	263	28	91	12	1.3e+04	2.8	120	12.8	42	6.8
122	2.9	148	15.8	51	8	500.61	0.002	5.7	263	28.1	91	12	1.3e+04	2.9	120	12.8	42	6.8

* *The S/N is per spectral bin. For point sources,* ***Eff*** *refers to the total efficiency including the slit loss and atmospheric transmission.*

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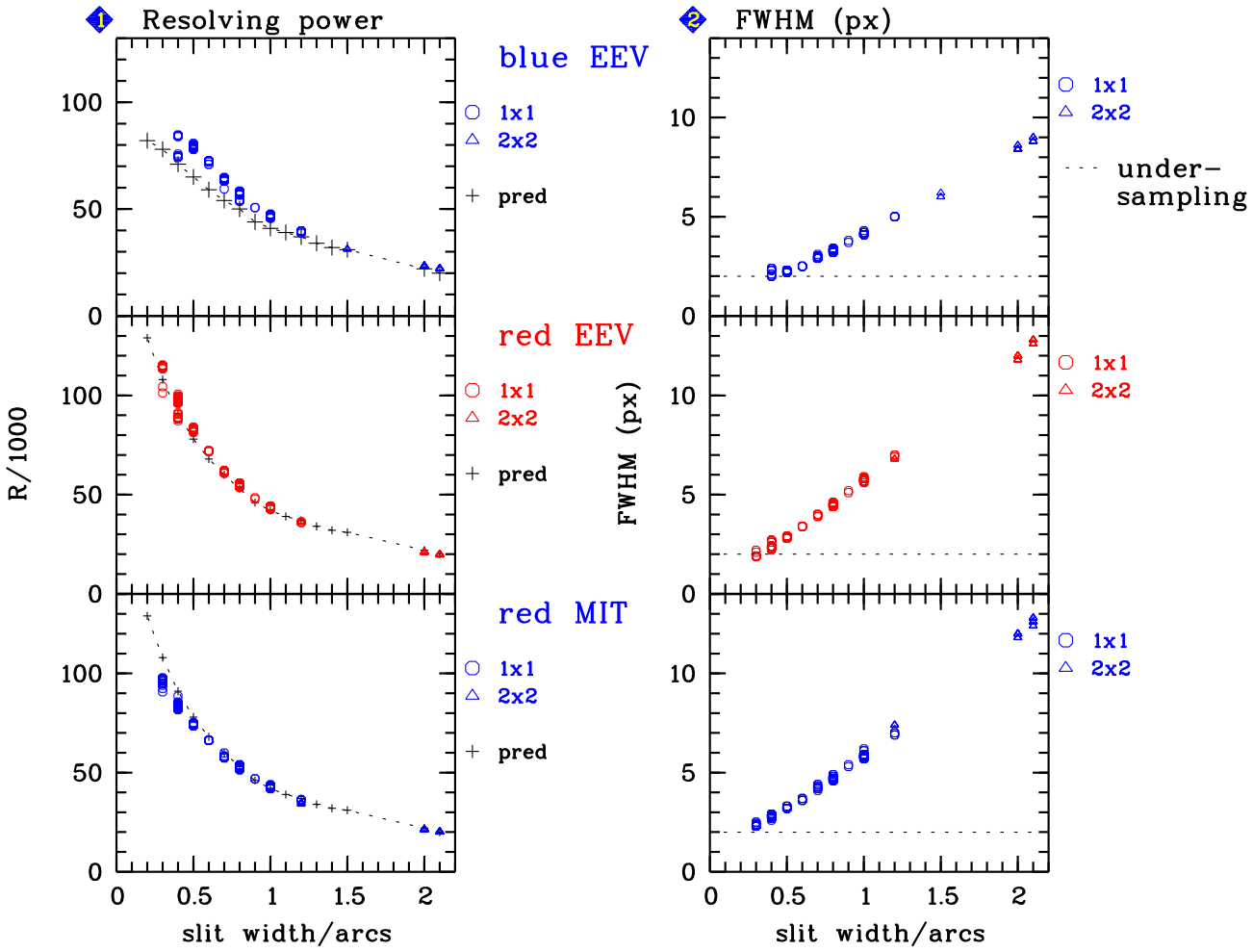

Figure 2.7: Measured (mean) resolving power R (in 1000) and FWHM (in pixels) as a function of the slit width. The data have been measured as part of the pipeline processing of service mode data in the time between October 2000 and June 2001. Values for 2×2 binning modes are scaled and were added only for slit widths ≥ 1.0 arcsec where no 1×1 data was available. The predicted values for R are indicated by $+$ symbols. The 10%-reduced resolving power measured on the MIT/LL chip is due to charge diffusion effects in this CCD (cf. text). The 2-pixel sampling limit is indicated by dashed horizontal lines. In the blue, the CCD pixel size in the center of an order is $\sim \lambda/193,000$ or 0.215 arcsec in the spectral direction. In the red, these numbers are $\lambda/250,000$ and 0.155 arcsec.