

Supplement to
Version 8 of IMK/IAA MIPAS reactive nitrogen reservoir gases:
Error estimates for ClONO₂

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July 28, 2026

In this document we present:

1. the definitions of the representative atmospheres used for the calculation of error budgets (Tab. S1).
2. the quantities which enter the error estimation calculations (Tabs. S2–S4).
3. the collection of the respective error budgets for FR data (2002–2004), which are listed in tables S5–S38 and depicted in figures S1–S34, and the respective error budgets for RR data (2005–2012), which are listed in tables S39–S72 and depicted in figures S35–S68 for the nominal observation mode, and shown in figures S73–S106 and listed in tables S73–S106 for the middle atmosphere observation mode.

The errors are presented as absolute errors in pptv in the tables and as relative errors in the figures.

Table S1: Labels and definitions of the representative atmospheric conditions which were used to calculate the error budget for FR and RR nominal measurement mode data ($\beta_{max} = 95^\circ$) and RR middle atmosphere measurement mode data ($\beta_{max} = 98^\circ$).

representative atmosphere label	month(s) used	latitude range	solar zenith angle range
Northern polar winter day	Jan, Feb	$65^\circ \text{ N} - 90^\circ \text{ N}$	$< 90^\circ$
Northern polar winter night	Jan, Feb	$65^\circ \text{ N} - 90^\circ \text{ N}$	$> \beta_{max}$
Northern polar spring day	Apr	$65^\circ \text{ N} - 90^\circ \text{ N}$	$< 90^\circ$
Northern polar spring night	Apr	$65^\circ \text{ N} - 90^\circ \text{ N}$	$> \beta_{max}$
Northern polar summer day	Jul, Aug	$65^\circ \text{ N} - 90^\circ \text{ N}$	$< 90^\circ$
Northern polar summer night	Jul, Aug	$65^\circ \text{ N} - 90^\circ \text{ N}$	$> \beta_{max}$
Northern polar autumn day	Oct	$65^\circ \text{ N} - 90^\circ \text{ N}$	$< 90^\circ$
Northern polar autumn night	Oct	$65^\circ \text{ N} - 90^\circ \text{ N}$	$> \beta_{max}$
Northern midlatitude winter day	Jan, Feb	$40^\circ \text{ N} - 60^\circ \text{ N}$	$< 90^\circ$
Northern midlatitude winter night	Jan, Feb	$40^\circ \text{ N} - 60^\circ \text{ N}$	$> \beta_{max}$
Northern midlatitude spring day	Apr	$40^\circ \text{ N} - 60^\circ \text{ N}$	$< 90^\circ$
Northern midlatitude spring night	Apr	$40^\circ \text{ N} - 60^\circ \text{ N}$	$> \beta_{max}$
Northern midlatitude summer day	Jul, Aug	$40^\circ \text{ N} - 60^\circ \text{ N}$	$< 90^\circ$
Northern midlatitude summer night	Jul, Aug	$40^\circ \text{ N} - 60^\circ \text{ N}$	$> \beta_{max}$
Northern midlatitude autumn day	Oct	$40^\circ \text{ N} - 60^\circ \text{ N}$	$< 90^\circ$
Northern midlatitude autumn night	Oct	$40^\circ \text{ N} - 60^\circ \text{ N}$	$> \beta_{max}$
Tropics day	Apr	$20^\circ \text{ S} - 20^\circ \text{ N}$	$< 90^\circ$
Tropics night	Apr	$20^\circ \text{ S} - 20^\circ \text{ N}$	$> \beta_{max}$
Southern midlatitude winter day	Jul, Aug	$40^\circ \text{ S} - 60^\circ \text{ S}$	$< 90^\circ$
Southern midlatitude winter night	Jul, Aug	$40^\circ \text{ S} - 60^\circ \text{ S}$	$> \beta_{max}$
Southern midlatitude spring day	Oct	$40^\circ \text{ S} - 60^\circ \text{ S}$	$< 90^\circ$
Southern midlatitude spring night	Oct	$40^\circ \text{ S} - 60^\circ \text{ S}$	$> \beta_{max}$
Southern midlatitude summer day	Jan, Feb	$40^\circ \text{ S} - 60^\circ \text{ S}$	$< 90^\circ$
Southern midlatitude summer night	Jan, Feb	$40^\circ \text{ S} - 60^\circ \text{ S}$	$> \beta_{max}$
Southern midlatitude autumn day	Apr	$40^\circ \text{ S} - 60^\circ \text{ S}$	$< 90^\circ$
Southern midlatitude autumn night	Apr	$40^\circ \text{ S} - 60^\circ \text{ S}$	$> \beta_{max}$
Southern polar winter day	Jul, Aug	$65^\circ \text{ S} - 90^\circ \text{ S}$	$< 90^\circ$
Southern polar winter night	Jul, Aug	$65^\circ \text{ S} - 90^\circ \text{ S}$	$> \beta_{max}$
Southern polar spring day	Oct	$65^\circ \text{ S} - 90^\circ \text{ S}$	$< 90^\circ$
Southern polar spring night	Oct	$65^\circ \text{ S} - 90^\circ \text{ S}$	$> \beta_{max}$
Southern polar summer day	Jan, Feb	$65^\circ \text{ S} - 90^\circ \text{ S}$	$< 90^\circ$
Southern polar summer night	Jan, Feb	$65^\circ \text{ S} - 90^\circ \text{ S}$	$> \beta_{max}$
Southern polar autumn day	Apr	$65^\circ \text{ S} - 90^\circ \text{ S}$	$< 90^\circ$
Southern polar autumn night	Apr	$65^\circ \text{ S} - 90^\circ \text{ S}$	$> \beta_{max}$

In the following three tables we summarize the ingoing errors for the retrievals of ClONO₂ in the FR NOM, RR NOM, and RR MA observation modes, respectively. In cases where no preceding retrievals in the RR MA observation mode were available for interfering gases (neither V5 nor V8), we used the uncertainties of the climatological database (Kiefer et al., 2002) for calculations of the error budgets.

Table S2: Assumed 1 σ uncertainties affecting the retrieval of ClONO₂ (FR NOM)

Type of Uncertainty	Value / typical value ¹	Source ²	Propagation Method ³
noise (A band)	30 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
noise (B band)	16 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
offset (A band)	6 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
offset (B band)	2.5 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
gain random (A and B band)	0.21%	Kleinert et al. (2018)	P(21;22)
gain systematic (A band)	1.15%	Kleinert et al. (2018)	P(21;22)
gain systematic (B band)	1.03%	Kleinert et al. (2018)	P(21;22)
spectral shift	0.00029 cm ⁻¹	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
ILS	3%	Hase (2000, 2003)	P(7;14;15)
Temp., noise	0.24 - 1.04 K	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Tang. alt., noise	35 - 79 m	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Temp., spectral shift	0.01 - 0.71 K	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Tang. alt., spectral shift	2 - 41 m	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Temp., offset	0.05 - 0.39 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., offset	8 - 24 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., ILS	0.03 - 1.26 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., ILS	7 - 122 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., CO ₂ intensities	0.03 - 0.16 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Tang. alt., CO ₂ intensities	24 - 35 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Temp., CO ₂ broadening	0.09 - 1.10 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Tang. alt., CO ₂ broadening	189 - 298 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Temp., gain, syst.	0.30 - 0.79 K	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Tang. alt., gain, syst.	2 - 51 m	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Temp.e, gain, random	0.05 - 0.15 K	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Tang. alt., gain, random	0.4 - 9 m	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
vmr(CH ₄)	5.62E-03 - 7.72E-02 ppmv	preceding V8 retrieval (Glatthor et al., 2024)	G(6)
vmr(CO ₂)	7.56E-01 - 7.51E+00 ppmv	WACCM model calc. (Kiefer et al., 2021)	P(20)
vmr(H ₂ O)	1.60E-01 - 2.54E+00 ppmv	preceding V8 retrieval (Kiefer et al., 2023)	G(6)
vmr(N ₂ O)	2.21E-04 - 7.89E-03 ppmv	preceding V8 retrieval (Glatthor et al., 2024)	G(6)
vmr(NO ₂)	3.09E-07 - 2.27E-04 ppmv	preceding V8 retrieval (Funke et al., 2026)	G(6)
vmr(HNO ₃)	6.18E-05 - 4.78E-04 ppmv	preceding V8 retrieval (this paper)	G(6)
spectroscopic data	2.5%	Wagner and Birk (2003)	P(7)

¹ For variable uncertainties typical values are reported. Some errors in Kleinert et al. (2018) are given in terms of 2 σ ; we have re-scaled them to 1 σ . ² In some cases V5 data were used of which no journal publication is available. In these cases, reference to an earlier data version is made. ³ Temperature and tangent altitude errors due to noise, spectral shift, and offset are propagated separately. The notation is as follows: “G” refers to generalized Gaussian error propagation in a matrix formalism, while “P” refers to perturbation studies. The numbers in parentheses are the respective equation numbers in von Clarmann et al. (2022).

Table S3: Assumed 1σ uncertainties affecting the retrieval of ClONO₂ (RR NOM)

Type of Uncertainty	Value / typical value ¹	Source ²	Propagation Method ³
noise (A band)	20 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
noise (B band)	10 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
offset (A band)	3 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
offset (B band)	1.5 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
gain random (A and B band)	0.21%	Kleinert et al. (2018)	P(21;22)
gain systematic (A band)	1.15%	Kleinert et al. (2018)	P(21;22)
gain systematic (B band)	1.03%	Kleinert et al. (2018)	P(21;23)
spectral shift	0.00029 cm ⁻¹	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
ILS	3%	Hase (2000, 2003)	P(7;14;15)
Temp., noise	0.22 - 1.23 K	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Tang. alt., noise	29 - 52 m	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Temp., spectral shift	0.01 - 0.10 K	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Tang. alt., spectral shift	1 - 15 m	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Temp., offset	0.03 - 0.45 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., offset	8 - 16 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., ILS	0.05 - 1.16 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., ILS	8 - 113 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., CO ₂ intensities	0.03 - 0.18 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Tang. alt., CO ₂ intensities	26 - 34 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Temp., CO ₂ broadening	0.14 - 1.47 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Tang. alt., CO ₂ broadening	198 - 252 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Temp., gain, syst.	0.22 - 0.81 K	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Tang. alt., gain, syst.	1 - 49 m	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Temp., gain, random	0.04 - 0.15 K	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Tang. alt., gain, random	0.2 - 9 m	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
vmr(CH ₄)	7.76E-03 - 9.78E-02 ppmv	preceding V8 retrieval (Glatthor et al., 2024)	G(6)
vmr(CO ₂)	7.56E-01 - 7.51E+00 ppmv	WACCM model calc. (Kiefer et al., 2021)	P(20)
vmr(H ₂ O)	1.87E-01 - 2.24E+00 ppmv	preceding V8 retrieval (Kiefer et al., 2026)	G(6)
vmr(N ₂ O)	3.73E-04 - 1.03E-02 ppmv	preceding V8 retrieval (Glatthor et al., 2024)	G(6)
vmr(NO ₂)	2.03E-07 - 2.88E-04 ppmv	preceding V8 retrieval (Funke et al., 2026)	G(6)
vmr(HNO ₃)	5.54E-05 - 4.51E-04 ppmv	preceding V8 retrieval (this paper)	G(6)
spectroscopic data	2.5%	Wagner and Birk (2003)	P(7)

¹ For variable uncertainties typical values are reported. Some errors in Kleinert et al. (2018) are given in terms of 2σ ; we have re-scaled them to 1σ . ² In some cases V5 data were used of which no journal publication is available. In these cases, reference to an earlier data version is made. ³ Temperature and tangent altitude errors due to noise, spectral shift, and offset are propagated separately. The notation is as follows: “G” refers to generalized Gaussian error propagation in a matrix formalism, while “P” refers to perturbation studies. The numbers in parentheses are the respective equation numbers in von Clarmann et al. (2022).

Table S4: Assumed 1σ uncertainties affecting the retrieval of ClONO₂ (RR MA)

Type of Uncertainty	Value / typical value ¹	Source ²	Propagation Method ³
noise (A band)	20 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
noise (B band)	10 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
offset (A band)	3 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
offset (B band)	1.5 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
gain random (A and B band)	0.21%	Kleinert et al. (2018)	P(21;22)
gain systematic (A band)	1.15%	Kleinert et al. (2018)	P(21;22)
gain systematic (B band)	1.03%	Kleinert et al. (2018)	P(21;23)
spectral shift	0.00029 cm ⁻¹	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
ILS	3%	Hase (2000, 2003)	P(7;14;15)
Temp., noise	0.22 - 2.24 K	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Tang. alt., noise	27 - 47 m	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Temp., spectral shift	0.004 - 0.11 K	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Tang. alt., spectral shift	0.4 - 14 m	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Temp., offset	0.05 - 0.72 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., offset	1 - 16 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., ILS	0.08 - 0.78 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., ILS	0.5 - 83 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., CO ₂ intensities	0.02 - 0.12 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Tang. alt., CO ₂ intensities	20 - 35 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Temp., CO ₂ broadening	0.08 - 1.17 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Tang. alt., CO ₂ broadening	14 - 242 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Temp., gain, syst.	0.26 - 0.48 K	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Tang. alt., gain, syst.	0.3 - 32 m	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Temp., gain, random	0.05 - 0.09 K	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Tang. alt., gain, random	0.06 - 6 m	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
vmr(CH ₄)	6.13E-03 - 4.82E-02	preceding V8 retrieval (Glatthor et al., 2024)	G(6)
vmr(CO ₂)	7.56E-01 - 7.51E+00	WACCM model calculation (Kiefer et al., 2021)	P(20)
vmr(H ₂ O)	1.45E-01 - 7.31E-01	preceding V8 retrieval (Kiefer et al., 2026)	G(6)
vmr(N ₂ O)	2.71E-04 - 6.18E-03	preceding V8 retrieval (Glatthor et al., 2024)	G(6)
vmr(NO ₂)	1.19E-05 - 2.29E-04	preceding V8 retrieval (Funke et al., 2026)	G(6)
vmr(HNO ₃)	5.99E-05 - 4.23E-04	preceding V8 retrieval (this paper)	G(6)
spectroscopic data	2.5%	Wagner and Birk (2003)	P(7)

¹ For variable uncertainties typical values are reported. Some errors in Kleinert et al. (2018) are given in terms of 2σ ; we have re-scaled them to 1σ . ² In some cases V5 data were used of which no journal publication is available. In these cases, reference to an earlier data version is made. ³ Temperature and tangent altitude errors due to noise, spectral shift, and offset are propagated separately. The notation is as follows: “G” refers to generalized Gaussian error propagation in a matrix formalism, while “P” refers to perturbation studies. The numbers in parentheses are the respective equation numbers in von Clarmann et al. (2022).

Table S5: CLONO2 error budget for Northern polar winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-12.98	0.61	1.81	0.87	7.21	2.58	5.92	4.93	15.78	19.24	1.13	19.28
10	18.36	0.32	2.05	0.70	5.75	2.18	7.28	3.43	15.21	17.65	5.19	18.40
13	199.19	0.21	9.83	1.01	7.02	2.12	27.01	5.34	21.67	31.65	19.42	37.14
16	535.75	0.16	14.42	1.38	9.28	6.08	34.71	6.21	30.93	45.27	21.98	50.33
19	886.26	0.18	13.46	2.83	10.74	11.05	42.68	6.26	39.12	56.90	24.08	61.79
22	1133.66	0.17	11.33	1.05	11.23	13.49	58.18	7.49	47.11	60.25	49.68	78.09
25	978.23	0.17	13.81	1.67	10.78	12.11	60.46	8.08	53.73	60.69	58.14	84.05
28	827.21	0.29	13.93	1.34	11.92	9.97	48.99	6.36	60.46	63.61	49.87	80.83
31	700.22	0.58	14.17	1.05	18.67	9.24	40.54	5.20	68.04	71.32	43.01	83.28
34	570.69	0.66	12.01	1.31	25.94	4.78	36.58	4.03	75.28	80.17	37.89	88.68
37	430.76	1.82	6.56	1.59	37.97	8.45	34.69	3.28	83.56	92.29	35.20	98.78
40	282.31	2.86	4.53	1.25	52.47	16.16	30.17	2.99	93.60	107.91	32.85	112.80
43	151.46	3.15	5.16	0.85	53.21	16.57	22.02	2.48	88.65	103.96	26.19	107.20
46	69.75	2.97	9.16	1.32	36.31	17.58	11.29	1.96	61.61	71.84	22.09	75.16

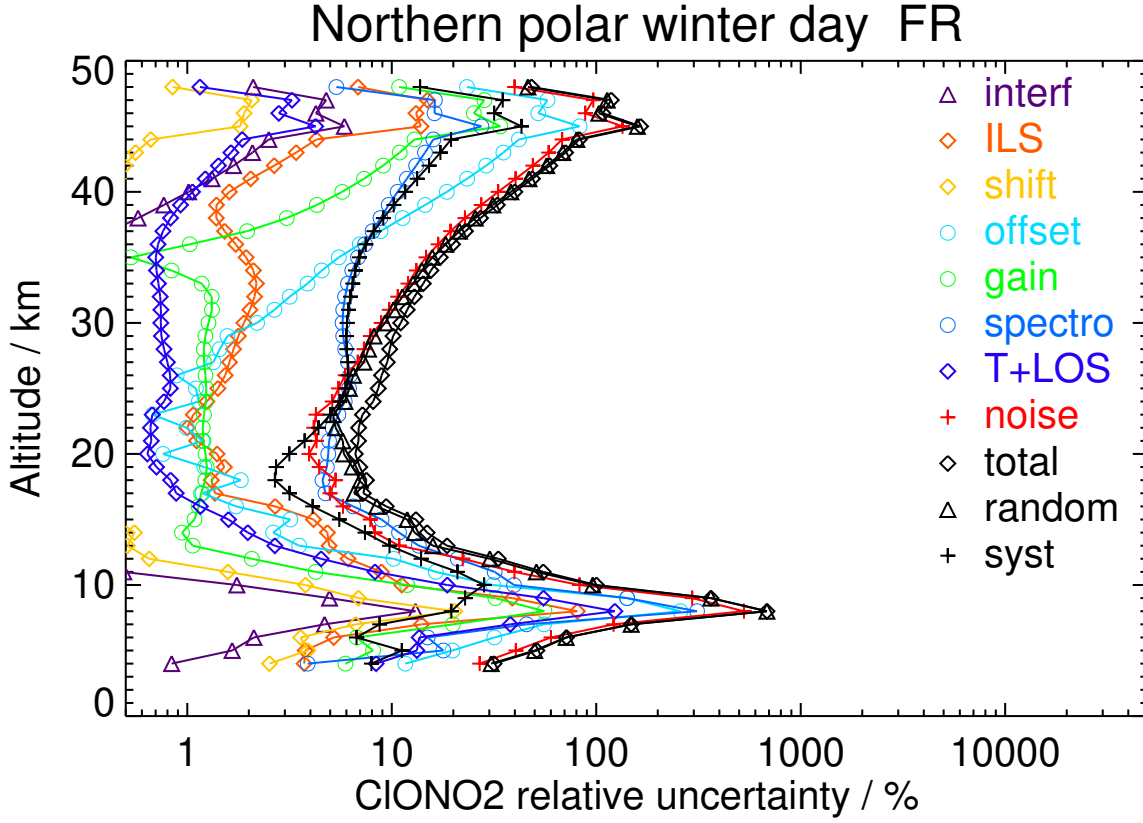


Figure S1: V8H.CLONO2.61 Northern polar winter day

Table S6: CLONO2 error budget for Northern polar winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-11.17	0.65	0.71	0.63	4.31	2.23	3.46	4.13	10.67	12.80	1.96	12.95
10	24.07	0.36	2.18	0.53	6.91	2.45	10.16	4.03	15.90	19.66	6.67	20.76
13	196.05	0.09	6.21	0.58	9.59	2.64	17.11	3.74	23.37	29.67	10.52	31.47
16	332.84	0.16	8.05	0.73	12.49	4.28	24.44	3.82	33.28	43.29	9.25	44.26
19	515.38	0.15	11.89	1.65	14.16	4.97	30.08	5.05	42.49	52.10	19.76	55.72
22	972.98	0.16	8.43	1.52	13.85	10.50	40.69	6.57	50.12	62.07	27.08	67.72
25	1063.95	0.20	14.65	2.03	12.50	12.63	55.05	7.38	56.00	62.52	53.36	82.19
28	913.53	0.34	16.62	1.88	13.53	12.04	55.87	7.31	61.71	66.03	56.84	87.12
31	713.55	0.66	17.71	1.45	19.58	10.25	46.68	6.17	68.32	73.23	48.23	87.69
34	551.44	0.75	14.55	1.23	26.27	5.12	36.84	4.28	75.12	80.35	38.62	89.15
37	424.51	1.95	6.92	1.31	35.78	9.31	33.55	3.13	81.82	89.65	34.82	96.18
40	285.97	3.22	3.43	0.95	50.15	18.21	29.65	2.87	90.23	103.68	33.89	109.08
43	159.78	3.86	5.25	0.76	53.49	18.94	22.13	2.58	88.78	104.12	28.29	107.90
46	41.33	3.36	9.15	1.32	37.51	18.82	10.46	2.33	61.30	72.11	23.01	75.69

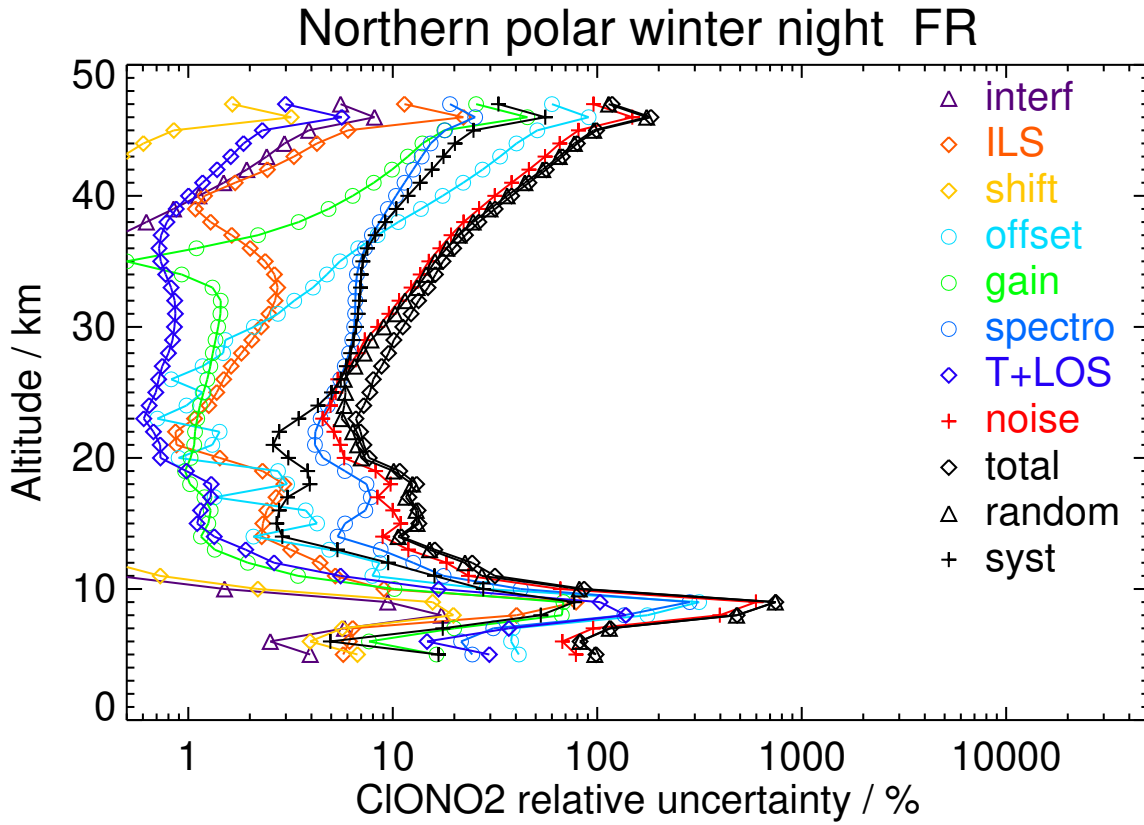


Figure S2: V8H.CLONO2_61 Northern polar winter night

Table S7: CLONO2 error budget for Northern polar spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-14.38	0.45	2.05	0.98	11.29	2.04	8.02	4.46	20.94	25.64	1.45	25.68
10	24.14	0.27	2.87	0.45	8.79	1.74	10.50	4.26	19.39	23.72	5.54	24.35
13	259.70	0.30	15.02	1.04	8.29	2.93	38.30	7.18	23.21	32.54	36.09	48.59
16	824.82	0.19	16.57	1.08	7.50	7.48	32.83	6.90	29.09	38.27	29.92	48.58
19	1078.01	0.25	15.87	3.03	6.51	13.46	50.42	6.88	35.17	44.97	47.84	65.65
22	1016.58	0.18	16.57	1.80	6.26	13.13	56.77	7.79	41.50	49.02	55.61	74.13
25	921.37	0.17	10.08	1.39	6.39	12.01	48.60	6.60	48.79	51.21	49.52	71.24
28	804.15	0.26	14.39	1.17	8.62	11.35	45.80	5.88	56.07	57.45	48.86	75.42
31	574.88	0.57	16.83	1.50	15.16	10.08	38.74	5.24	63.67	65.92	43.06	78.73
34	307.62	0.85	13.68	1.33	21.75	5.25	28.12	3.76	71.41	74.96	31.23	81.21
37	114.51	1.91	6.58	1.60	27.71	9.12	22.89	2.38	75.97	81.19	24.69	84.86
40	6.69	3.04	1.71	1.60	39.54	20.89	21.12	3.04	81.95	91.31	29.10	95.84
43	-35.64	3.26	5.01	0.76	46.83	24.52	19.19	3.29	83.11	95.73	30.86	100.58
46	-34.91	3.02	5.64	0.53	40.32	19.18	14.78	2.40	64.80	76.60	24.31	80.36

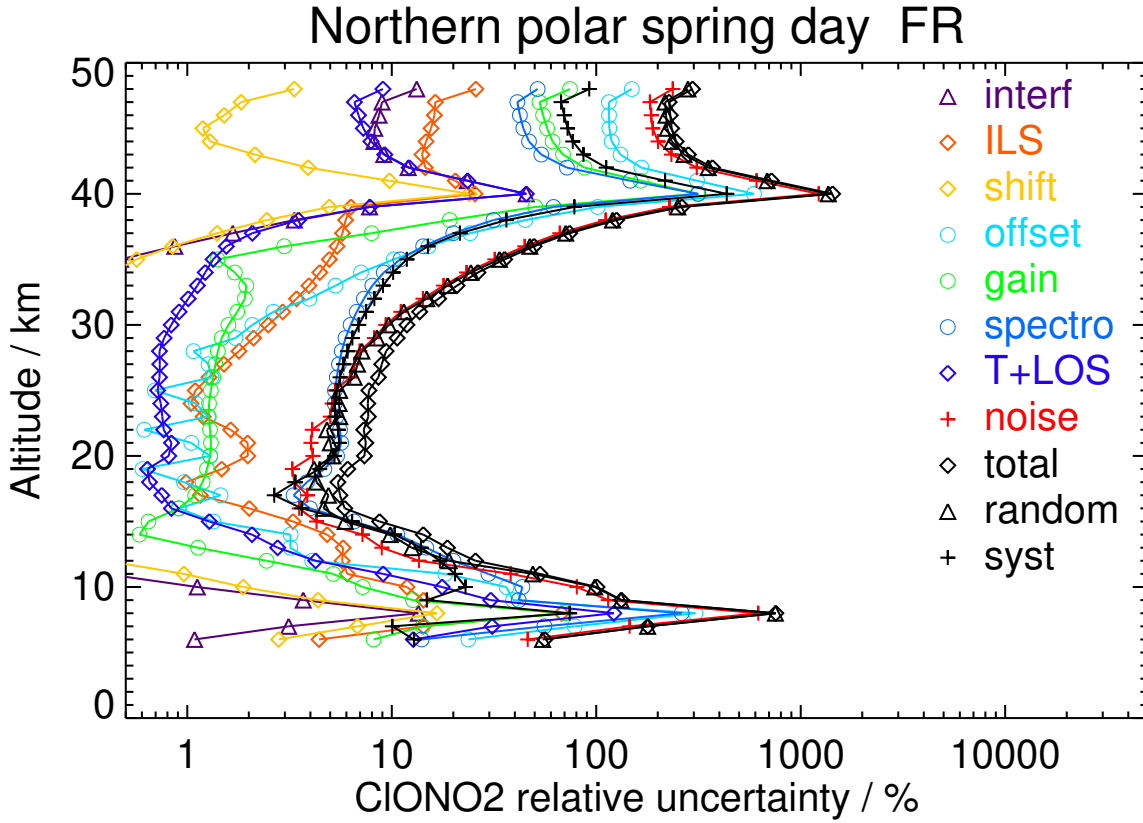


Figure S3: V8H.CLONO2.61 Northern polar spring day

Table S8: CLONO2 error budget for Northern polar spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-35.80	0.44	3.16	1.21	11.55	3.43	12.43	5.59	21.88	28.59	2.06	28.66
10	60.08	0.24	3.46	0.59	7.65	2.69	15.56	4.11	17.88	24.36	7.98	25.63
13	292.47	0.29	13.48	1.30	6.46	2.34	33.53	6.21	21.22	30.94	29.77	42.94
16	773.12	0.20	15.29	1.23	6.46	7.87	38.04	6.73	27.73	41.95	28.98	50.99
19	1104.05	0.25	13.64	2.84	6.00	13.57	50.10	6.57	34.57	47.51	43.64	64.51
22	1091.81	0.22	14.92	1.70	6.15	14.82	60.70	7.92	41.22	52.39	56.44	77.01
25	1014.18	0.24	10.75	1.23	6.64	12.66	52.91	6.87	48.39	52.86	52.11	74.23
28	932.58	0.38	13.64	1.02	9.19	11.79	49.43	6.08	55.77	58.13	51.20	77.47
31	765.76	0.68	16.86	1.35	16.47	11.35	45.39	5.85	64.28	67.08	49.11	83.14
34	514.89	0.96	14.89	1.32	22.70	6.15	38.29	4.83	72.15	76.12	40.97	86.44
37	273.01	2.03	8.75	1.63	28.97	9.08	33.14	3.39	76.52	82.24	34.74	89.27
40	98.31	3.19	3.10	1.70	41.86	20.47	29.15	3.05	82.97	93.33	35.03	99.69
43	1.27	3.39	3.17	0.90	48.70	23.79	24.05	2.95	84.00	97.47	33.20	102.97
46	-39.97	2.95	4.27	0.52	41.06	18.23	16.55	2.12	64.46	76.71	24.39	80.49

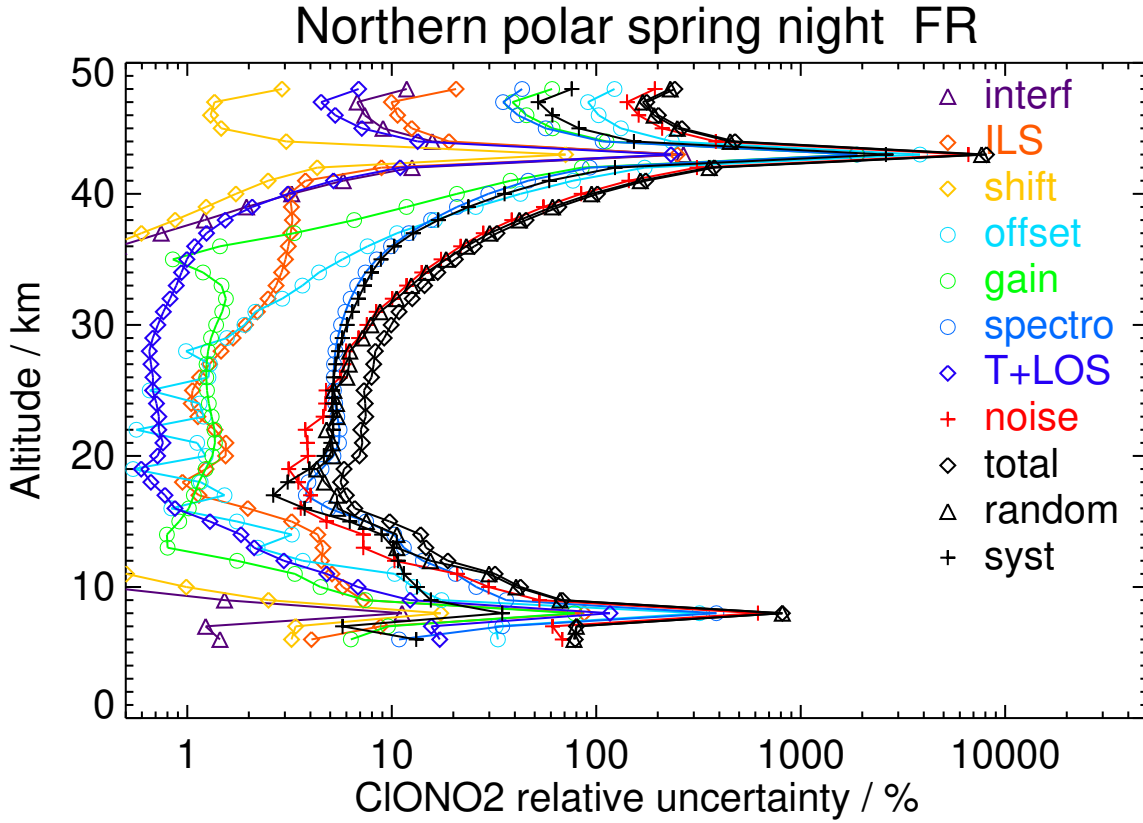


Figure S4: V8H-CLONO2_61 Northern polar spring night

Table S9: CLONO2 error budget for Northern polar summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-39.05	0.55	1.12	1.06	9.63	4.79	7.12	5.21	19.25	22.68	7.24	23.81
10	5.27	0.39	0.77	0.42	4.57	1.34	3.21	2.16	12.45	13.89	0.79	13.91
13	7.72	0.27	1.01	0.37	6.74	1.04	3.37	2.26	19.04	20.63	1.11	20.65
16	46.34	0.11	4.41	0.40	8.66	1.20	9.74	2.82	26.94	28.84	9.64	30.41
19	252.02	0.13	4.10	0.72	10.09	0.88	14.98	3.04	35.10	37.14	14.38	39.82
22	462.43	0.14	3.41	0.63	10.79	4.28	14.87	1.80	43.56	45.43	14.30	47.63
25	484.43	0.16	5.42	0.68	10.98	6.49	21.11	2.49	50.60	52.17	21.99	56.61
28	498.42	0.26	8.53	0.45	11.12	7.28	23.99	2.74	56.96	58.87	24.74	63.86
31	425.36	0.60	12.26	0.92	15.63	8.24	23.59	2.98	63.80	66.34	26.44	71.41
34	262.93	0.83	10.86	1.16	20.13	4.91	20.00	2.31	71.13	74.24	22.39	77.55
37	123.46	2.27	5.36	2.05	21.96	9.76	21.54	2.33	74.81	78.21	23.77	81.74
40	28.38	3.10	1.03	2.96	31.74	23.00	23.25	3.38	76.58	83.33	32.08	89.29
43	-10.46	3.58	3.99	2.29	41.76	28.30	23.63	3.72	81.10	91.72	36.26	98.63
46	-27.60	3.47	4.85	0.88	37.57	22.35	18.83	2.50	63.34	74.02	29.02	79.50

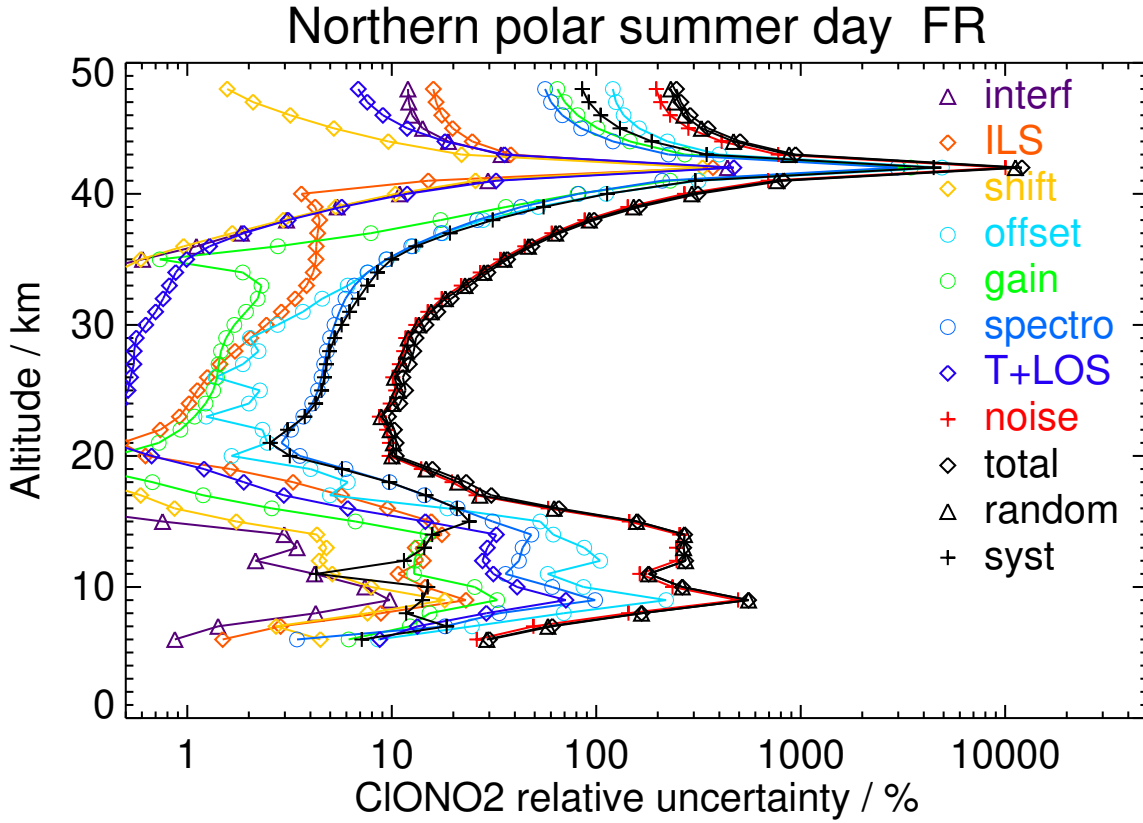


Figure S5: V8H.CLONO2_61 Northern polar summer day

Table S10: CIONO2 error budget for Northern polar summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
10	-4.19	0.35	0.56	0.27	5.00	0.66	2.19	1.74	12.71	13.95	0.71	13.97
13	6.43	0.26	0.83	0.30	8.32	0.91	2.85	2.27	20.40	22.34	1.08	22.36
16	43.44	0.12	4.45	0.25	10.74	1.12	9.99	3.21	28.77	31.13	10.24	32.77
19	259.47	0.16	5.23	0.70	12.46	0.79	15.93	3.50	37.77	40.33	15.80	43.32
22	505.64	0.19	2.05	0.85	12.87	3.51	14.02	1.88	46.46	48.70	13.04	50.41
25	659.84	0.26	3.99	0.28	12.23	6.78	21.02	2.69	53.16	55.01	21.48	59.05
28	800.74	0.38	8.79	0.47	12.10	10.12	30.93	3.68	58.67	61.00	31.90	68.84
31	798.90	0.69	15.30	1.15	16.35	12.35	37.19	4.83	65.00	67.88	40.99	79.30
34	617.85	0.94	15.26	1.47	21.46	8.56	36.23	4.69	72.27	75.72	39.92	85.60
37	382.68	2.29	8.96	1.82	23.67	8.11	36.90	3.80	76.05	79.92	38.58	88.74
40	176.81	3.16	4.09	2.48	34.08	21.50	36.76	3.54	77.76	85.27	42.37	95.22
43	38.38	4.00	1.11	1.75	44.01	25.84	32.34	3.24	82.04	93.46	40.95	102.04
46	-17.40	3.35	1.82	0.72	38.27	19.22	21.76	2.10	62.74	73.72	28.79	79.14
49	-0.10	2.38	1.35	0.17	28.84	12.20	14.52	1.15	44.66	53.28	18.87	56.52

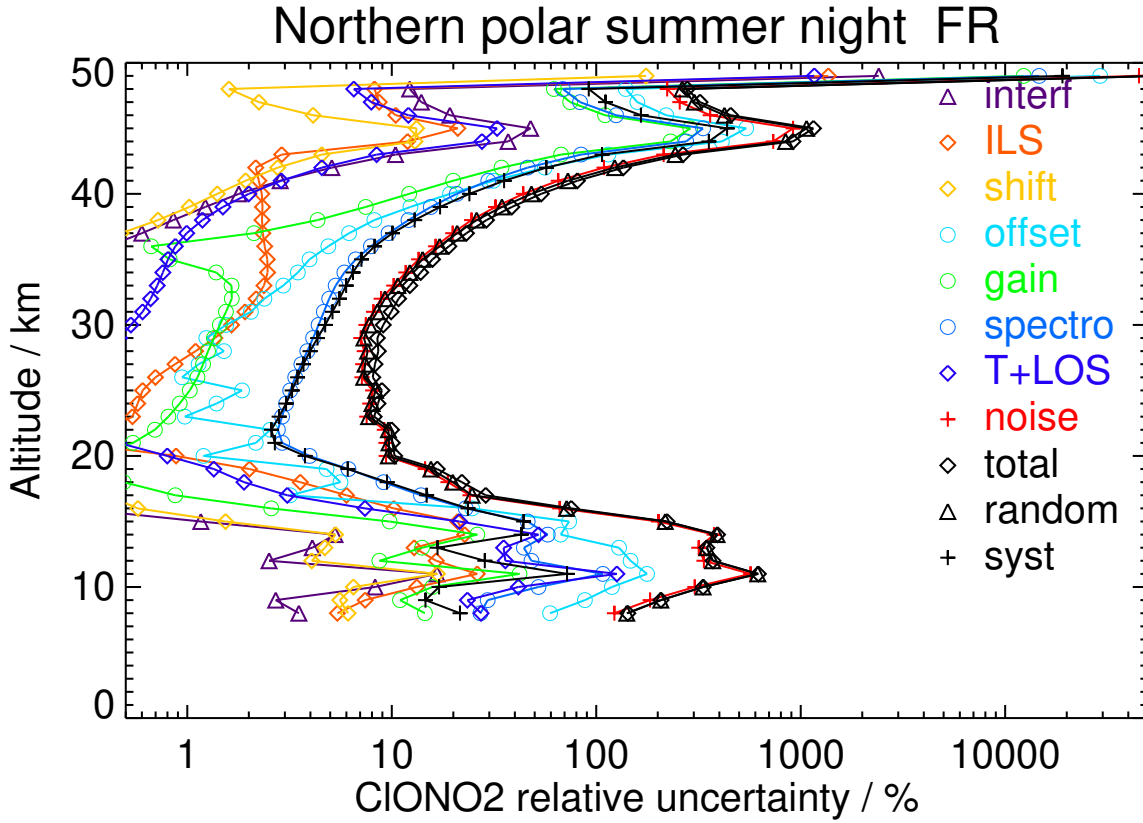


Figure S6: V8H_CLONO2.61 Northern polar summer night

Table S11: CLONO2 error budget for Northern polar autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-10.55	0.49	0.88	0.64	8.42	1.37	3.49	2.58	14.54	17.42	0.95	17.45
10	-0.23	0.24	1.10	0.26	9.14	1.19	4.36	2.34	16.55	19.61	0.48	19.61
13	23.47	0.15	2.20	0.26	11.14	1.51	7.80	2.57	21.80	25.84	2.48	25.96
16	132.51	0.11	6.10	0.62	13.10	2.00	15.54	3.60	29.04	32.92	15.08	36.21
19	385.16	0.13	4.31	1.15	14.48	2.13	17.78	3.25	37.49	41.99	14.27	44.34
22	624.45	0.13	3.62	0.69	13.84	5.13	18.94	2.74	45.37	48.26	18.09	51.54
25	750.93	0.15	5.55	0.76	12.29	7.56	31.02	3.82	53.00	55.19	31.30	63.45
28	736.32	0.29	7.45	0.38	12.44	8.80	38.01	4.54	60.81	62.68	39.01	73.83
31	653.75	0.61	9.64	0.54	19.17	8.10	39.10	4.88	69.03	72.39	40.05	82.73
34	533.65	0.48	10.97	0.99	31.27	5.21	37.40	4.48	78.18	84.97	37.92	93.04
37	382.85	2.00	9.65	1.41	45.37	3.39	36.11	3.84	88.87	100.38	36.20	106.71
40	247.10	3.17	7.20	1.21	59.38	8.57	31.00	3.32	98.19	115.22	31.63	119.48
43	128.98	3.10	4.37	0.69	60.81	10.00	20.89	2.46	91.82	110.50	22.10	112.69
46	-7.26	3.07	4.31	0.66	42.60	13.17	12.16	1.77	62.86	76.30	17.25	78.23

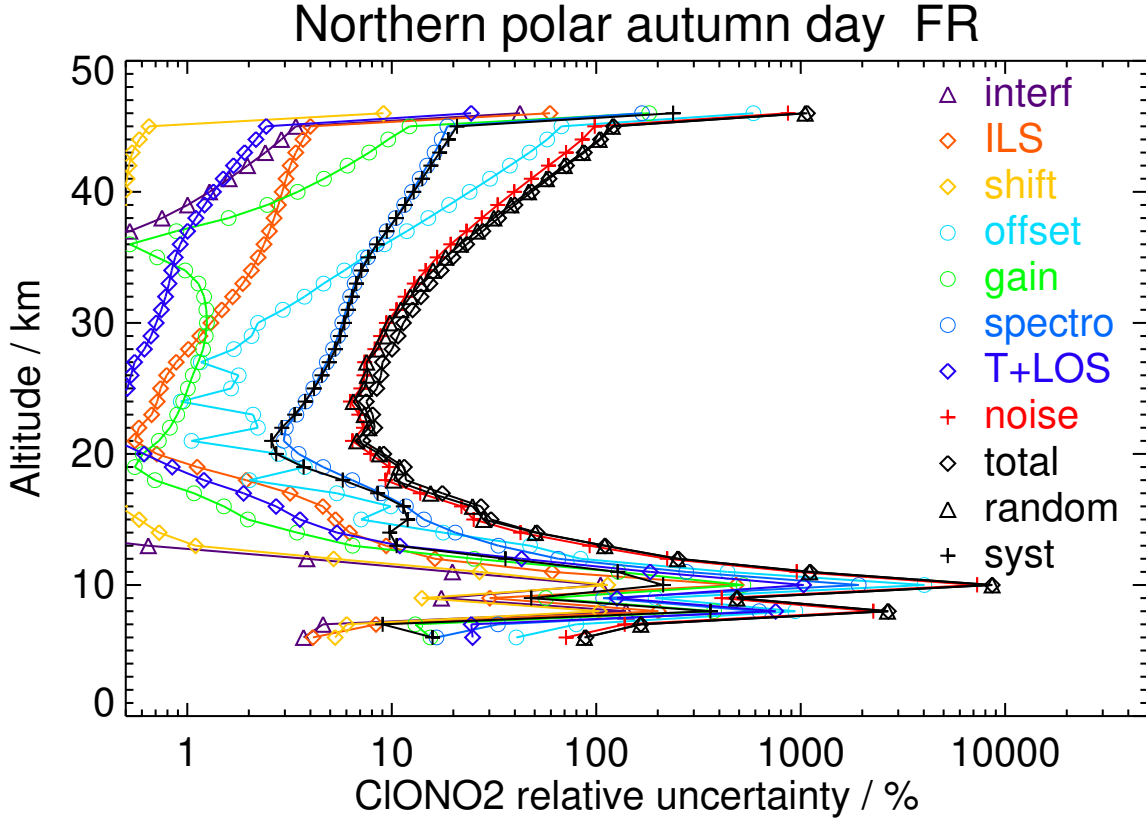


Figure S7: V8H-CLONO2_61 Northern polar autumn day

Table S12: CLONO2 error budget for Northern polar autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-13.14	0.54	0.69	0.64	8.88	1.81	3.17	3.43	15.74	18.73	1.41	18.79
10	9.20	0.27	0.83	0.26	9.07	1.08	3.70	2.77	16.86	19.74	0.55	19.75
13	35.36	0.17	2.00	0.20	10.30	1.59	7.59	2.73	21.43	24.50	6.07	25.24
16	227.34	0.11	8.44	0.75	11.93	1.68	19.84	4.25	28.74	32.12	20.56	38.14
19	516.55	0.16	2.76	1.29	12.26	3.25	15.41	2.89	36.48	39.51	13.63	41.80
22	711.38	0.15	6.14	0.70	11.20	6.66	26.10	3.49	44.19	47.32	24.80	53.43
25	814.17	0.22	5.86	0.52	10.16	8.47	34.41	4.40	51.91	53.58	35.17	64.09
28	818.24	0.37	7.85	0.44	11.36	9.53	40.57	4.80	60.13	62.45	40.82	74.61
31	810.96	0.66	10.50	0.59	18.59	9.27	42.78	5.12	68.63	72.48	43.08	84.32
34	749.94	0.59	12.92	1.23	30.22	6.83	43.78	5.17	77.61	84.22	44.75	95.37
37	580.58	1.88	12.35	1.83	43.16	3.27	44.89	4.88	87.50	98.20	45.65	108.29
40	370.02	3.10	9.67	1.67	57.29	9.28	40.14	4.27	96.60	112.88	41.17	120.15
43	182.87	3.11	5.81	0.94	59.92	10.97	27.59	3.02	91.66	109.92	29.06	113.69
46	41.08	2.44	1.96	0.41	42.70	10.73	13.40	1.59	62.93	76.30	16.39	78.04

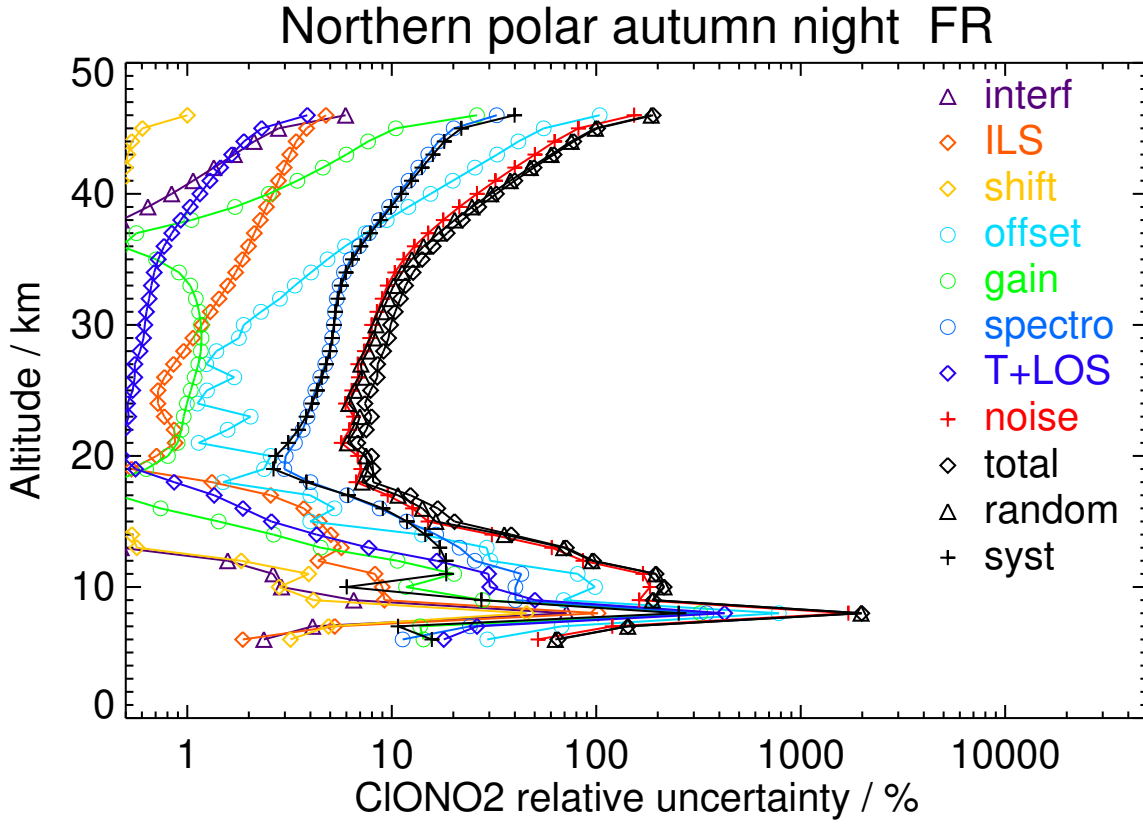


Figure S8: V8H.CLONO2.61 Northern polar autumn night

Table S13: CIONO2 error budget for Northern midlatitude winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-17.00	0.72	1.04	0.81	4.32	2.51	3.86	4.75	11.41	13.80	2.05	13.95
10	19.23	0.37	1.41	0.59	5.62	2.18	7.13	3.59	14.56	17.00	5.05	17.73
13	138.31	0.16	5.52	0.57	6.91	1.50	15.07	3.38	19.54	25.16	8.26	26.48
16	293.59	0.15	6.67	0.60	8.86	3.28	19.17	3.49	27.24	33.41	11.81	35.44
19	539.38	0.13	7.22	1.99	10.40	5.00	25.34	3.84	35.87	43.88	14.39	46.18
22	769.30	0.14	5.05	0.72	11.27	7.86	27.93	3.74	44.35	47.69	26.49	54.55
25	807.53	0.16	8.01	0.61	11.01	9.64	39.62	4.91	51.70	54.21	40.09	67.42
28	712.42	0.29	12.09	0.81	11.87	9.13	41.60	5.13	58.69	61.00	43.03	74.65
31	561.12	0.60	14.65	0.90	18.16	9.01	35.69	4.72	66.24	69.34	38.77	79.44
34	406.97	0.75	12.33	1.17	23.71	4.20	30.15	3.46	73.01	77.13	32.19	83.57
37	273.34	1.90	5.35	1.45	33.09	9.78	27.94	2.69	79.19	86.13	29.40	91.01
40	164.97	2.73	2.95	1.19	48.13	19.08	22.76	2.88	88.43	101.10	28.68	105.09
43	79.33	3.13	5.49	1.13	51.82	20.28	16.76	2.87	87.65	102.26	25.56	105.40
46	46.40	2.66	6.02	1.20	38.55	15.78	10.67	2.18	61.39	72.79	19.21	75.28

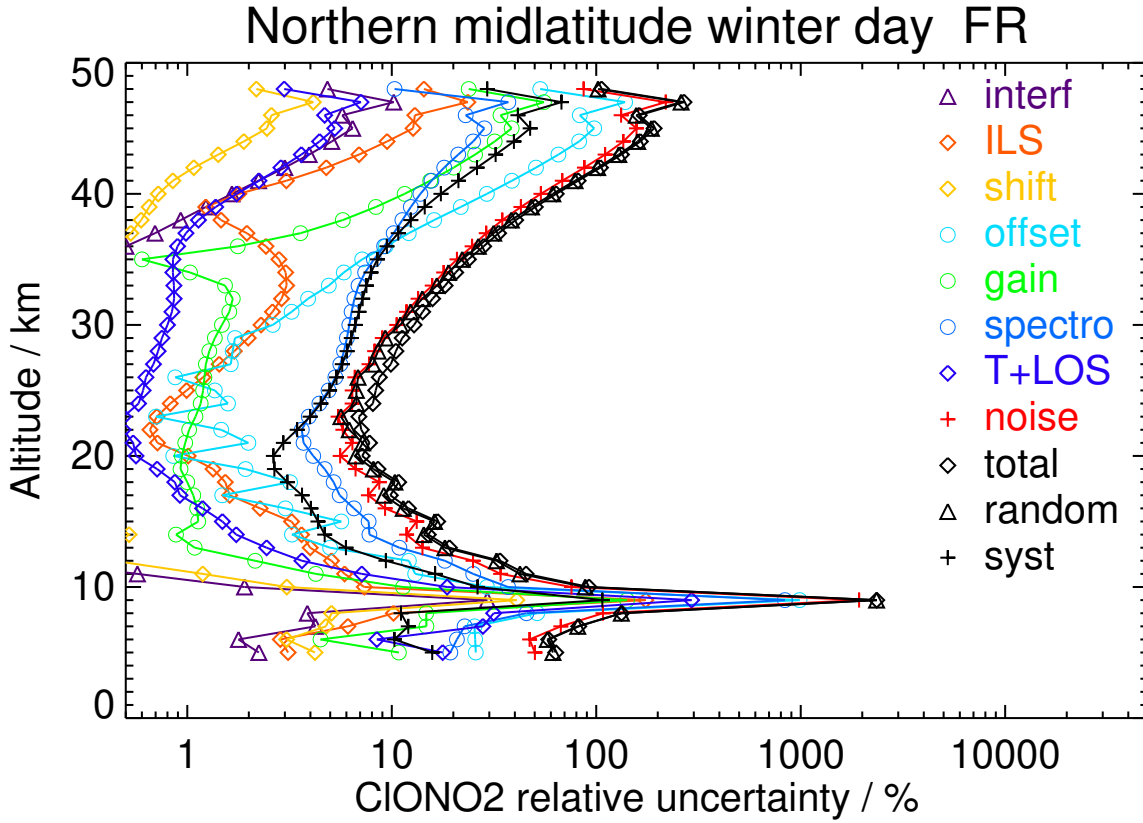


Figure S9: V8H_CLONO2.61 Northern midlatitude winter day

Table S14: CIONO2 error budget for Northern midlatitude winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-17.73	0.54	0.78	0.43	5.25	1.55	3.58	3.06	11.81	13.71	2.16	13.88
10	-2.60	0.22	1.53	0.42	9.07	2.92	9.41	3.85	19.06	22.83	6.25	23.67
13	186.98	0.10	7.09	0.51	11.77	2.14	19.82	3.80	25.58	33.03	12.83	35.43
16	356.70	0.18	6.85	0.71	13.77	4.27	17.83	3.68	32.98	39.45	10.86	40.92
19	592.11	0.14	7.25	1.71	14.92	5.24	23.13	3.87	40.64	47.59	15.54	50.07
22	848.45	0.16	6.67	0.87	14.85	8.43	27.64	3.77	47.92	51.38	27.78	58.41
25	909.58	0.18	7.95	0.63	13.84	9.96	41.83	5.11	53.76	56.32	43.00	70.86
28	804.57	0.30	10.57	0.75	13.58	9.90	43.17	5.09	60.03	62.11	45.07	76.74
31	713.70	0.62	13.30	0.82	17.94	9.78	38.61	4.61	66.99	69.86	41.42	81.21
34	613.49	0.74	13.76	1.12	24.22	6.70	36.50	4.08	73.64	77.78	39.31	87.15
37	435.13	1.72	8.32	1.58	32.77	6.56	37.32	3.48	79.85	86.57	38.43	94.72
40	251.91	2.84	3.18	1.31	47.36	16.40	32.40	2.98	88.05	100.33	35.73	106.50
43	110.06	3.59	3.88	0.87	52.52	18.86	23.62	2.65	87.91	102.78	29.55	106.94
46	29.87	3.34	6.69	0.97	38.89	16.68	11.79	2.00	61.87	73.34	20.96	76.28

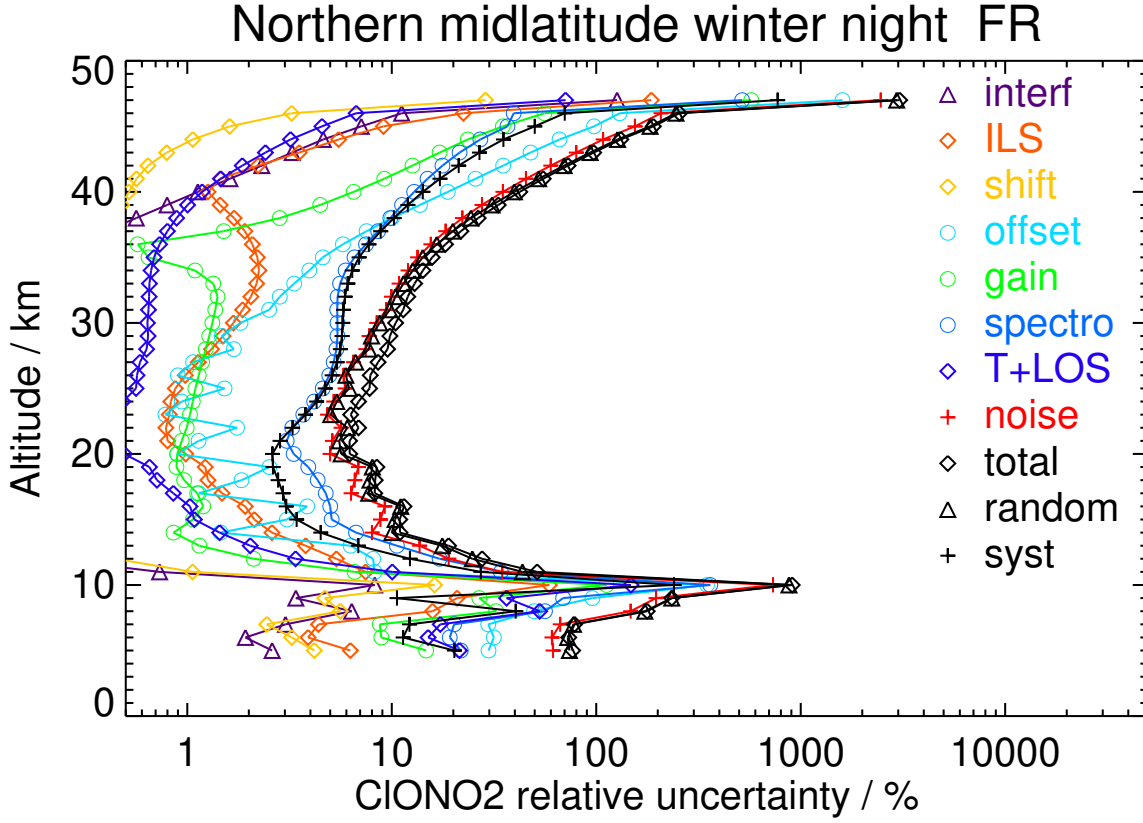


Figure S10: V8H_CLONO2.61 Northern midlatitude winter night

Table S15: CIONO2 error budget for Northern midlatitude spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-28.40	0.74	1.21	1.69	10.86	2.31	7.75	5.09	19.62	24.30	2.90	24.48
10	19.06	0.44	1.52	0.69	7.63	1.71	6.28	3.51	16.02	19.18	2.21	19.30
13	89.24	0.28	4.11	0.52	6.74	1.09	9.43	3.14	19.05	22.55	4.15	22.93
16	208.35	0.11	9.90	0.63	6.13	1.92	20.95	3.76	24.99	30.02	17.78	34.89
19	563.34	0.19	6.15	1.57	6.01	5.68	26.39	4.20	32.46	38.87	19.12	43.32
22	852.55	0.16	9.12	1.17	6.15	8.98	37.84	4.45	40.73	49.00	30.21	57.57
25	866.06	0.19	9.31	1.11	6.78	10.20	44.53	5.72	48.97	51.70	44.48	68.20
28	765.55	0.28	13.24	0.89	8.78	10.29	45.64	5.92	56.67	58.21	47.96	75.42
31	532.16	0.54	16.58	1.32	15.47	9.03	39.69	5.60	64.39	66.82	43.42	79.69
34	269.85	0.82	14.70	1.45	22.38	4.96	27.89	3.92	72.29	76.02	31.37	82.24
37	97.30	1.89	7.09	1.78	28.51	8.94	21.05	2.36	76.45	81.95	22.97	85.11
40	-6.16	2.68	3.30	1.57	39.66	21.83	17.74	3.22	82.28	91.72	27.43	95.73
43	-53.88	3.04	7.97	0.84	46.55	26.35	16.19	3.65	82.80	95.36	31.17	100.33
46	-53.32	3.58	8.30	1.12	40.12	20.99	13.29	2.77	65.27	76.95	25.61	81.10

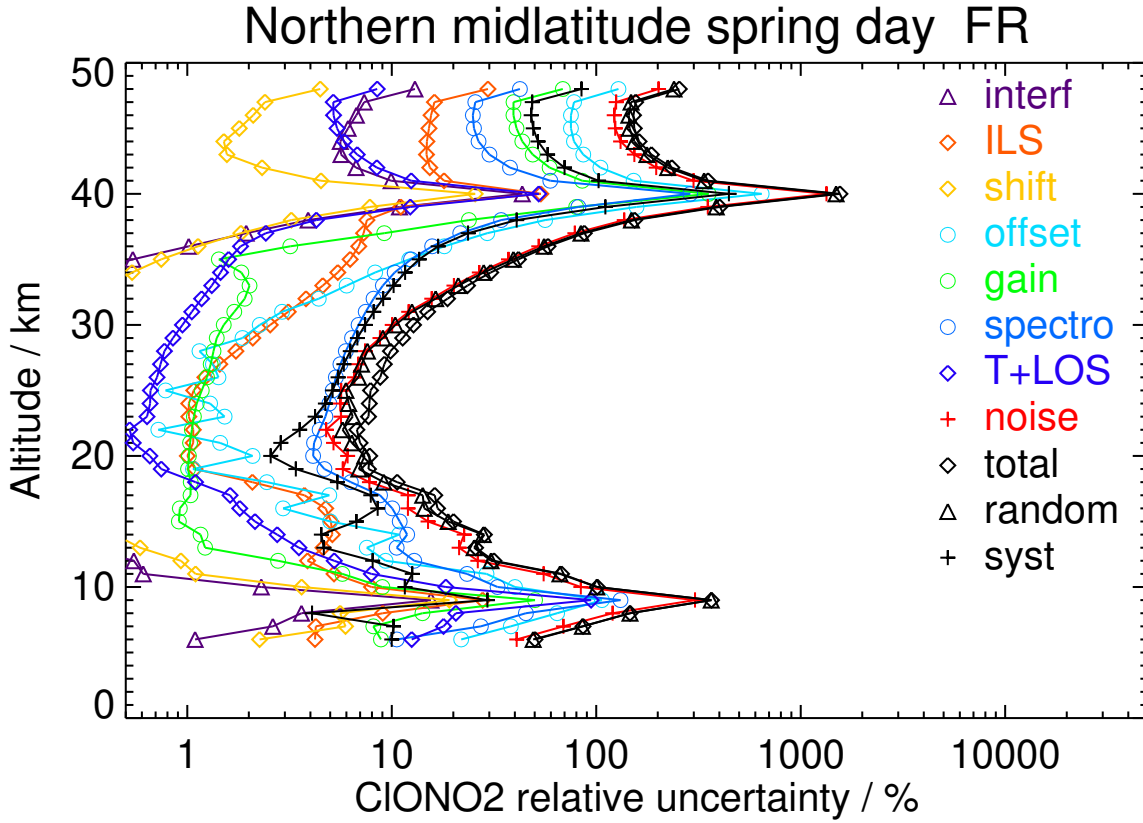


Figure S11: V8H_CLONO2_61 Northern midlatitude spring day

Table S16: CIONO2 error budget for Northern midlatitude spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-22.85	0.72	1.70	1.54	10.99	2.72	6.51	5.57	20.77	25.15	2.55	25.28
10	33.62	0.40	2.09	0.55	6.10	1.16	7.18	3.46	14.74	17.85	2.36	18.01
13	105.49	0.28	4.46	0.52	5.14	1.66	11.19	3.39	18.05	21.68	6.48	22.63
16	289.94	0.11	11.22	0.57	5.39	2.38	27.65	4.58	24.67	32.00	23.05	39.44
19	695.40	0.21	6.41	1.83	5.96	6.16	27.25	3.93	32.48	39.61	19.01	43.94
22	944.67	0.21	8.17	1.14	6.20	10.19	40.33	4.72	40.36	48.12	34.24	59.06
25	1001.51	0.26	8.29	1.19	6.69	11.37	43.15	5.63	48.15	50.33	43.86	66.76
28	1014.92	0.39	13.49	1.12	9.25	12.80	47.45	5.83	55.52	57.04	50.46	76.16
31	899.74	0.67	19.28	1.32	16.27	13.71	49.44	6.38	63.94	66.64	54.40	86.02
34	654.20	0.94	17.69	1.68	21.83	8.28	45.13	5.80	71.95	75.68	48.81	90.05
37	371.83	2.05	9.94	1.87	26.60	8.80	38.92	4.14	75.43	80.34	40.73	90.07
40	162.48	2.72	1.95	1.80	38.84	22.42	30.30	3.35	80.63	89.84	37.21	97.24
43	51.53	2.97	5.29	0.89	46.25	27.47	23.10	3.37	82.44	94.89	35.61	101.35
46	11.70	3.24	6.59	0.79	39.82	21.65	16.15	2.48	64.70	76.27	27.28	81.00

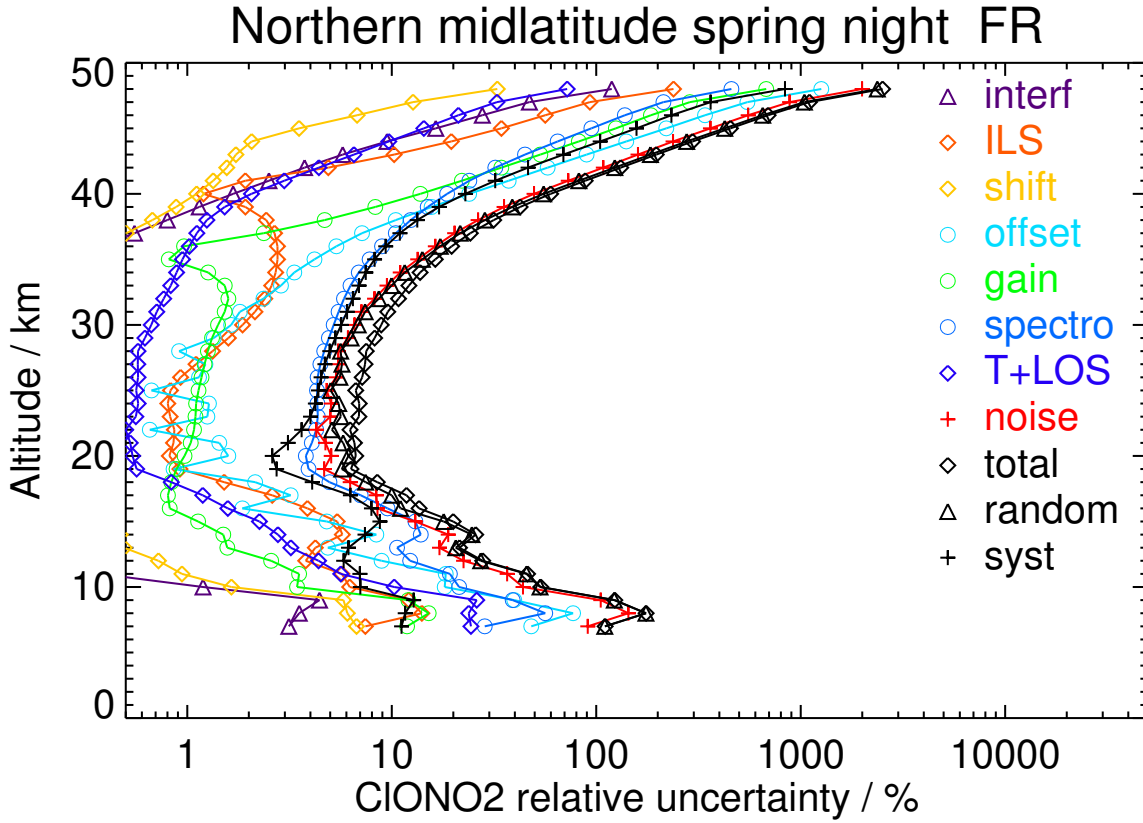


Figure S12: V8H_CLONO2.61 Northern midlatitude spring night

Table S17: CIONO2 error budget for Northern midlatitude summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
10	-17.92	0.75	1.09	0.58	3.52	2.91	7.46	3.24	11.30	13.36	6.20	14.73
13	0.07	0.50	0.94	0.68	6.07	1.61	5.02	2.86	17.68	19.31	3.74	19.67
16	9.58	0.12	2.18	0.37	8.21	0.68	4.71	2.39	25.65	27.51	1.38	27.54
19	127.32	0.13	7.88	0.71	10.24	1.06	21.89	4.03	34.50	36.50	22.85	43.06
22	520.87	0.13	2.30	1.40	11.34	2.24	19.91	3.52	43.49	45.58	19.06	49.41
25	821.74	0.16	4.72	0.49	10.35	7.77	25.83	3.26	50.66	51.97	27.08	58.60
28	854.77	0.27	14.13	0.84	10.45	11.13	43.91	5.46	56.80	58.29	47.11	74.95
31	616.32	0.57	19.89	1.35	15.86	11.99	42.79	5.90	63.76	66.14	48.48	82.00
34	329.82	0.99	15.51	1.71	19.65	6.24	31.68	4.08	70.80	73.71	35.62	81.87
37	134.44	2.44	6.19	2.07	21.63	10.18	26.59	2.64	73.84	77.14	28.91	82.38
40	11.65	2.73	1.94	2.03	33.26	23.29	22.78	3.06	76.07	83.34	32.14	89.32
43	-45.25	3.67	6.48	1.10	42.88	28.15	20.66	3.41	81.05	92.09	34.86	98.46
46	-53.96	4.26	6.90	0.53	37.98	21.98	16.16	2.35	63.89	74.69	27.61	79.63

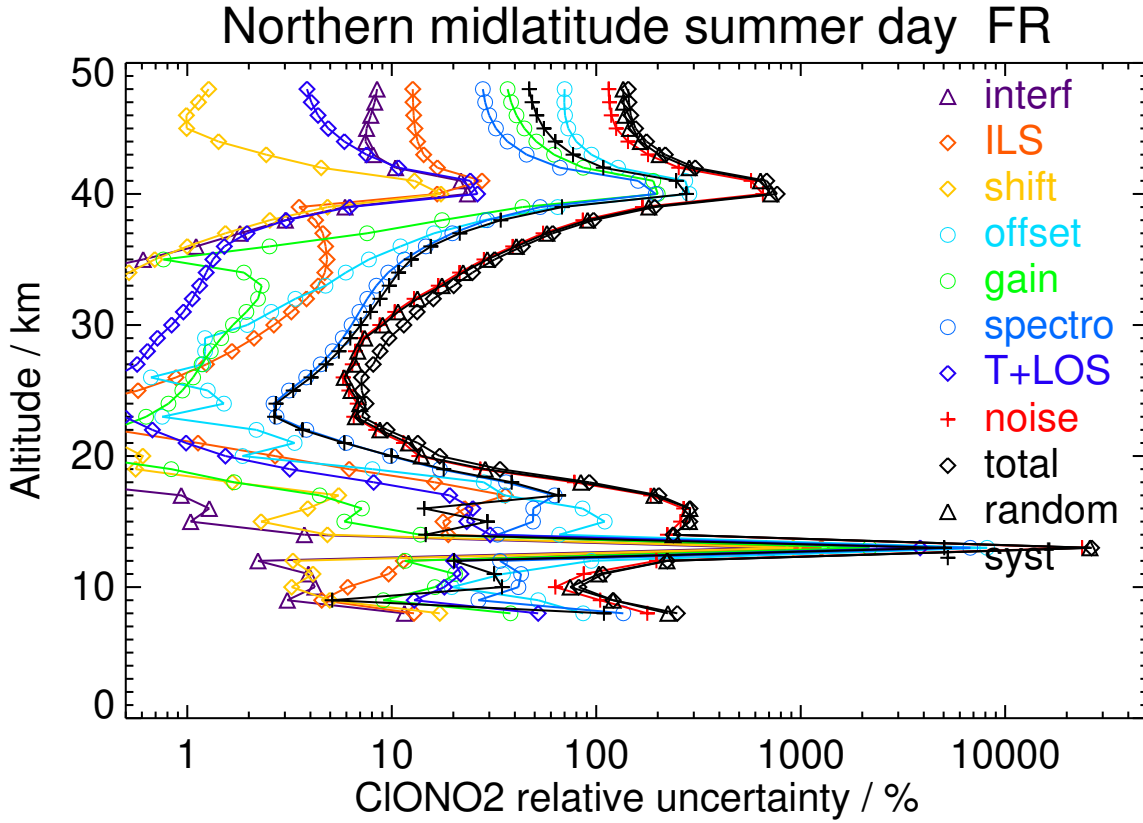


Figure S13: V8H_CLONO2_61 Northern midlatitude summer day

Table S18: CIONO2 error budget for Northern midlatitude summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
10	-11.94	0.58	0.60	0.46	4.48	1.89	6.34	2.43	12.38	14.00	5.29	14.97
13	-5.53	0.34	0.64	0.46	8.61	0.71	4.20	2.45	20.65	22.70	3.19	22.92
16	4.15	0.13	2.18	0.20	11.26	0.70	5.24	2.79	29.79	32.46	1.17	32.48
19	151.27	0.15	9.24	0.61	12.94	0.83	23.44	4.83	39.22	41.93	24.63	48.63
22	556.96	0.20	3.06	1.51	13.25	2.17	22.39	3.97	48.48	50.85	21.76	55.31
25	941.52	0.25	3.48	0.61	11.76	7.85	25.99	3.60	54.25	55.80	27.02	62.00
28	1093.48	0.37	13.19	0.81	11.50	13.21	46.13	5.75	59.82	61.48	49.41	78.87
31	956.23	0.65	21.18	1.49	16.31	15.47	51.77	6.98	65.86	68.47	57.75	89.58
34	723.64	0.84	19.21	1.83	20.66	10.53	46.30	6.01	72.93	76.21	51.00	91.70
37	448.97	2.18	9.87	1.95	23.87	7.91	41.43	4.45	76.58	80.53	43.07	91.32
40	232.25	2.63	2.29	2.20	34.78	22.55	34.55	3.63	78.39	86.13	40.85	95.33
43	88.50	3.32	5.60	1.34	44.10	28.27	26.92	3.56	82.83	94.29	38.68	101.92
46	20.30	3.33	6.37	0.57	37.44	21.71	18.00	2.46	62.70	73.38	28.31	78.66

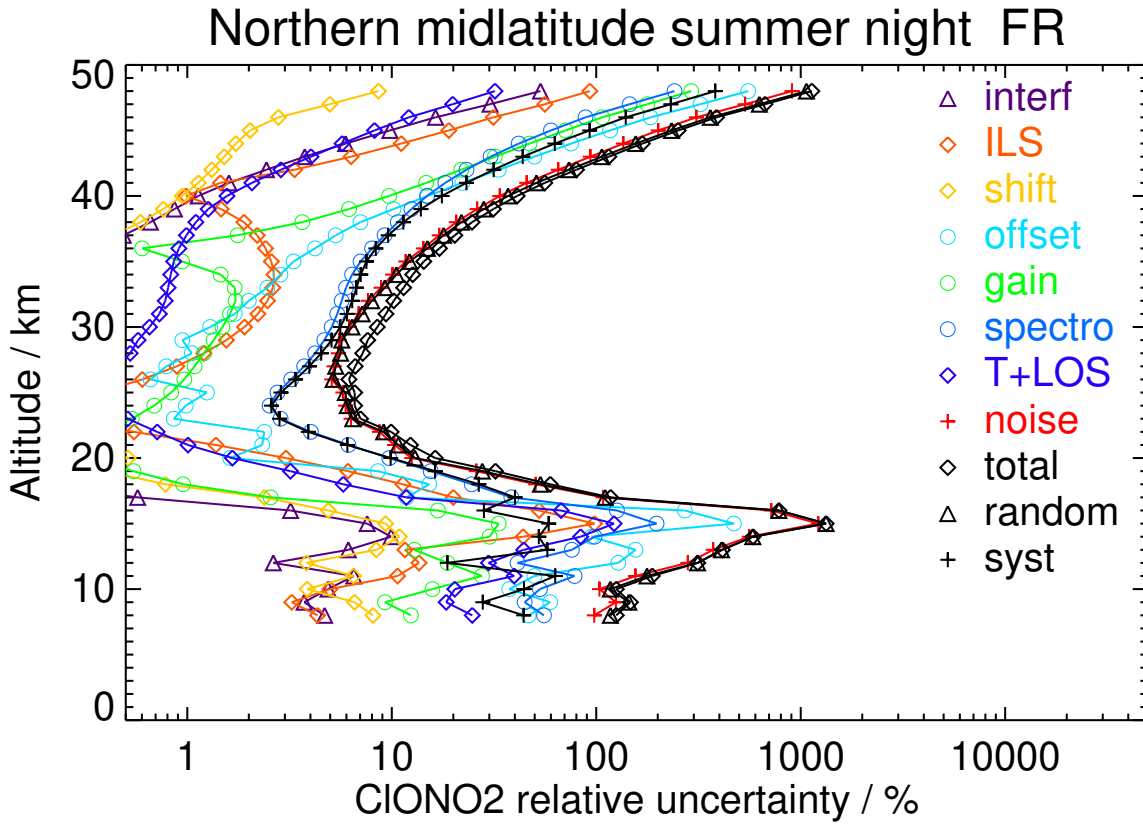


Figure S14: V8H.CLONO2_61 Northern midlatitude summer night

Table S19: CLONO2 error budget for Northern midlatitude autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-13.58	2.99	0.04	3.85	11.89	6.53	51.62	11.56	27.11	32.19	52.01	61.17
10	-13.36	0.34	0.68	0.32	7.67	1.24	4.84	1.46	14.62	17.31	0.70	17.33
13	7.12	0.22	1.35	0.24	11.22	0.65	4.47	2.28	22.13	25.32	1.41	25.36
16	27.81	0.08	6.15	0.51	14.51	1.11	15.51	3.81	31.68	36.92	12.06	38.84
19	290.74	0.13	8.51	0.79	16.01	1.37	23.11	4.42	40.07	44.71	22.16	49.91
22	599.00	0.14	2.60	0.99	15.86	4.52	18.02	3.08	48.06	51.80	15.52	54.07
25	797.75	0.16	5.76	0.52	13.93	7.58	28.75	4.11	53.04	55.34	29.65	62.79
28	810.23	0.24	11.34	0.66	12.78	9.33	41.25	5.10	58.83	60.74	43.36	74.62
31	634.40	0.51	16.19	1.04	16.92	9.47	42.73	5.62	64.54	67.15	46.41	81.62
34	363.45	0.56	15.19	1.20	23.23	6.12	33.69	4.43	71.75	75.70	37.17	84.34
37	168.84	1.74	7.08	1.65	30.61	7.40	26.28	2.67	77.85	83.87	27.77	88.35
40	52.31	2.49	2.22	1.51	44.51	19.18	20.36	2.98	84.76	96.07	27.21	99.85
43	-10.16	2.77	6.91	1.05	51.59	23.17	15.08	3.41	86.68	101.24	27.51	104.91
46	-15.00	2.59	7.93	1.20	40.37	18.52	9.39	2.71	62.40	74.57	21.74	77.68

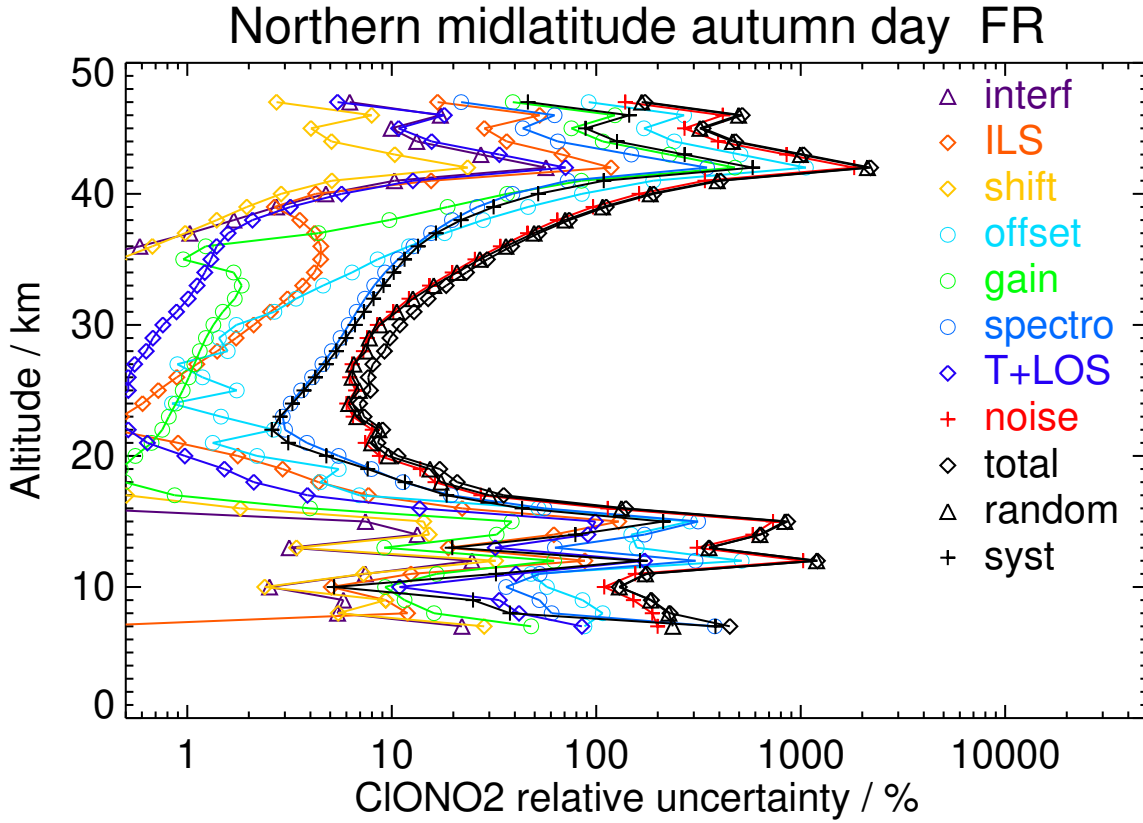


Figure S15: V8H.CLONO2.61 Northern midlatitude autumn day

Table S20: CLONO2 error budget for Northern midlatitude autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-24.89	0.84	0.96	1.51	9.35	1.66	7.66	4.31	17.07	21.04	4.48	21.51
10	-1.88	0.37	0.88	0.43	8.29	0.93	3.87	2.35	15.73	18.37	1.05	18.40
13	1.84	0.24	1.44	0.29	9.93	0.81	4.96	2.46	20.84	23.79	0.89	23.80
16	75.53	0.11	6.30	0.51	11.64	1.42	14.75	3.55	28.96	32.90	12.82	35.31
19	325.53	0.15	7.36	0.98	12.62	1.56	21.16	4.20	37.57	40.58	21.14	45.76
22	674.32	0.17	2.35	0.95	12.40	4.88	20.10	3.33	45.84	48.87	17.69	51.97
25	946.74	0.24	5.51	0.75	11.34	8.86	31.05	4.26	52.43	54.21	32.11	63.01
28	1004.10	0.36	10.94	0.67	11.37	11.03	47.02	5.67	59.20	60.72	49.31	78.22
31	888.94	0.61	16.32	1.02	16.56	11.56	50.53	6.41	65.74	68.26	54.14	87.13
34	682.56	0.71	17.47	1.23	24.57	8.73	45.72	5.87	73.35	77.89	49.26	92.16
37	458.37	1.66	11.27	1.70	32.67	5.19	41.31	4.30	79.94	86.91	42.29	96.65
40	264.98	2.54	5.00	1.63	46.11	17.27	35.15	3.50	86.47	98.55	38.36	105.76
43	118.52	3.06	5.17	0.94	53.47	21.76	25.71	3.19	87.62	103.19	32.70	108.25
46	16.32	2.90	6.29	0.83	40.98	18.77	14.96	2.42	62.92	75.38	24.22	79.18

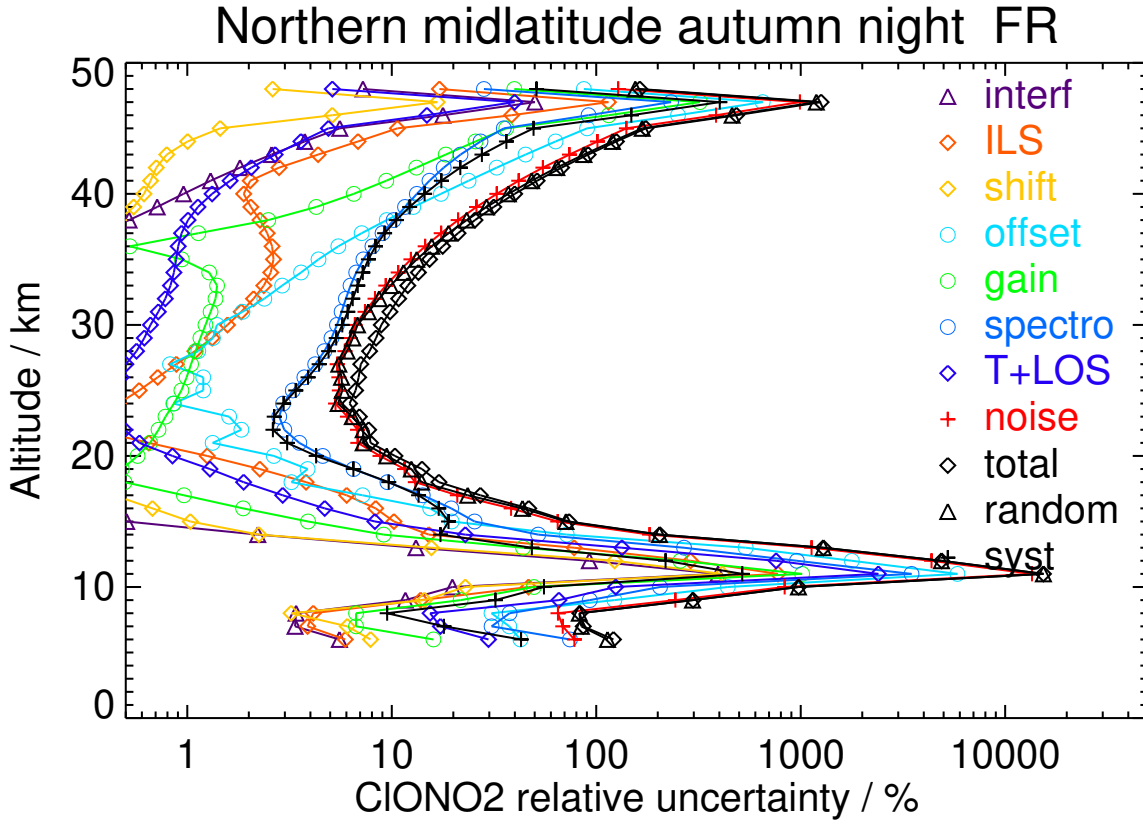


Figure S16: V8H.CLONO2_61 Northern midlatitude autumn night

Table S21: CLONO2 error budget for Tropics day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	53.11	3.68	5.51	4.61	11.10	25.07	63.33	12.59	29.50	37.09	66.94	76.53
10	-37.81	1.47	3.34	1.18	5.33	11.97	23.50	6.04	14.67	18.65	25.35	31.47
13	9.60	0.59	1.78	0.65	6.09	4.32	9.72	3.35	16.87	19.02	9.37	21.21
16	-15.57	0.17	1.42	0.51	6.90	1.15	4.56	1.84	24.68	25.91	3.66	26.16
19	30.50	0.09	3.28	0.53	5.91	1.52	9.69	1.80	32.21	32.97	9.81	34.40
22	188.53	0.12	2.12	1.10	6.07	0.81	11.77	2.17	40.12	41.01	10.71	42.38
25	410.14	0.16	2.31	0.75	6.63	3.16	11.52	1.89	47.87	48.70	10.74	49.87
28	515.34	0.24	9.87	0.84	8.13	5.77	23.94	2.35	54.75	55.80	25.69	61.43
31	399.86	0.49	15.77	1.31	14.37	7.88	27.93	3.27	62.77	64.80	32.43	72.46
34	207.75	0.74	14.37	1.64	21.40	5.48	22.15	2.47	71.44	74.80	26.50	79.35
37	77.86	1.90	6.86	2.10	26.22	8.75	20.17	1.90	74.93	79.66	22.33	82.73
40	36.19	2.32	2.42	1.86	36.66	22.51	18.41	3.22	79.97	88.25	28.64	92.78
43	-5.24	2.63	8.04	1.15	44.17	28.17	17.69	3.64	80.63	92.26	33.66	98.21
46	-28.20	3.64	8.67	1.30	39.10	22.74	14.55	2.70	65.98	77.00	27.92	81.90

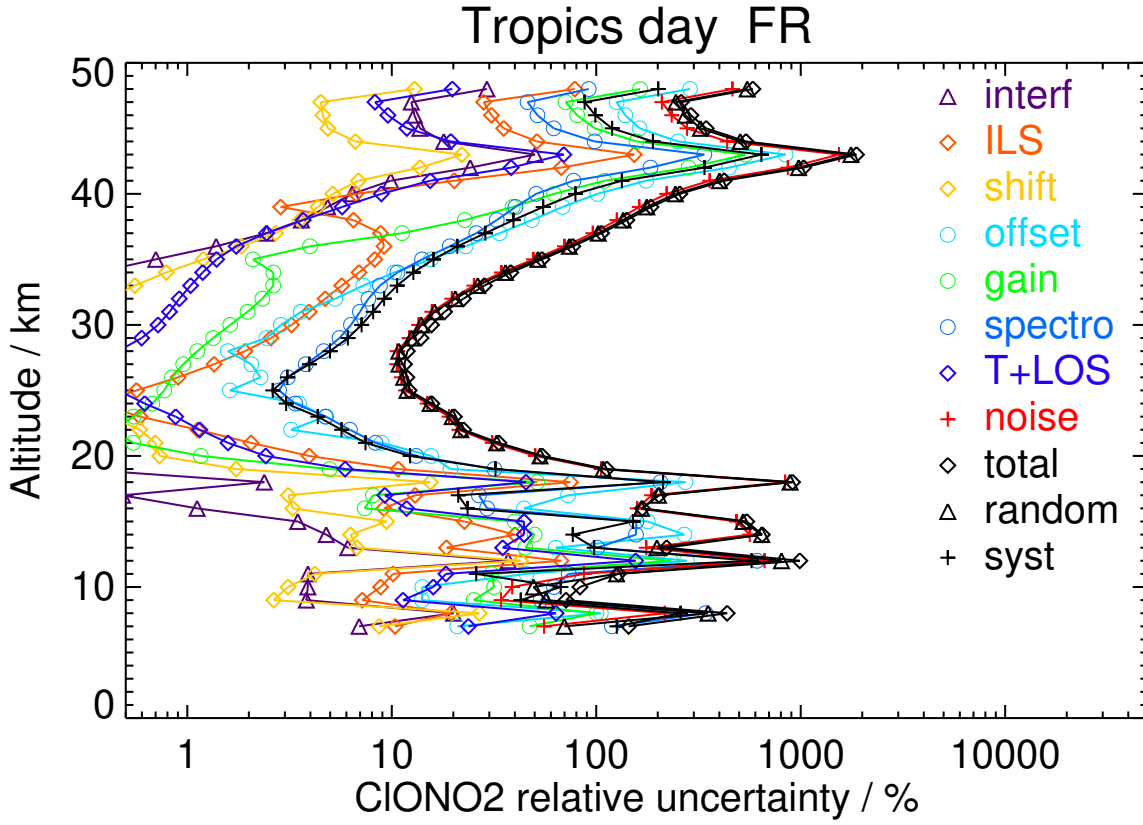


Figure S17: V8H.CLONO2.61 Tropics day

Table S22: CLONO2 error budget for Tropics night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	45.79	3.62	4.19	4.58	11.68	20.83	64.98	12.77	31.09	37.41	67.63	77.29
10	-17.11	1.28	2.62	1.73	9.72	8.15	19.48	5.69	20.35	30.67	7.61	31.60
13	-7.20	0.45	1.31	0.76	8.22	2.49	6.11	2.99	18.88	21.85	1.11	21.88
16	-9.54	0.27	1.47	0.70	8.11	1.25	3.86	1.93	25.87	27.49	1.44	27.53
19	15.10	0.15	2.57	0.47	4.66	1.27	8.46	1.88	32.28	32.98	7.69	33.87
22	193.56	0.16	2.48	1.30	4.15	1.01	15.31	2.70	40.03	40.68	14.68	43.25
25	479.17	0.21	1.75	1.03	5.34	3.80	13.07	2.36	48.21	48.82	12.82	50.47
28	669.96	0.36	10.57	0.97	8.01	7.80	24.45	2.49	55.33	56.37	26.93	62.47
31	629.83	0.62	17.19	1.51	15.05	11.43	31.95	3.68	63.77	65.97	37.46	75.87
34	486.98	1.01	14.57	1.88	19.87	6.88	32.38	3.58	71.46	74.50	35.73	82.62
37	328.14	2.12	7.41	2.28	24.53	9.85	32.74	3.14	74.65	78.92	34.49	86.13
40	195.15	2.32	1.45	2.10	36.35	23.42	28.18	3.29	79.27	87.50	36.24	94.71
43	100.37	2.59	7.33	1.17	44.08	29.18	23.75	3.50	81.12	92.65	37.81	100.06
46	35.55	3.68	8.40	0.95	39.09	23.59	17.76	2.60	65.64	76.71	30.27	82.47

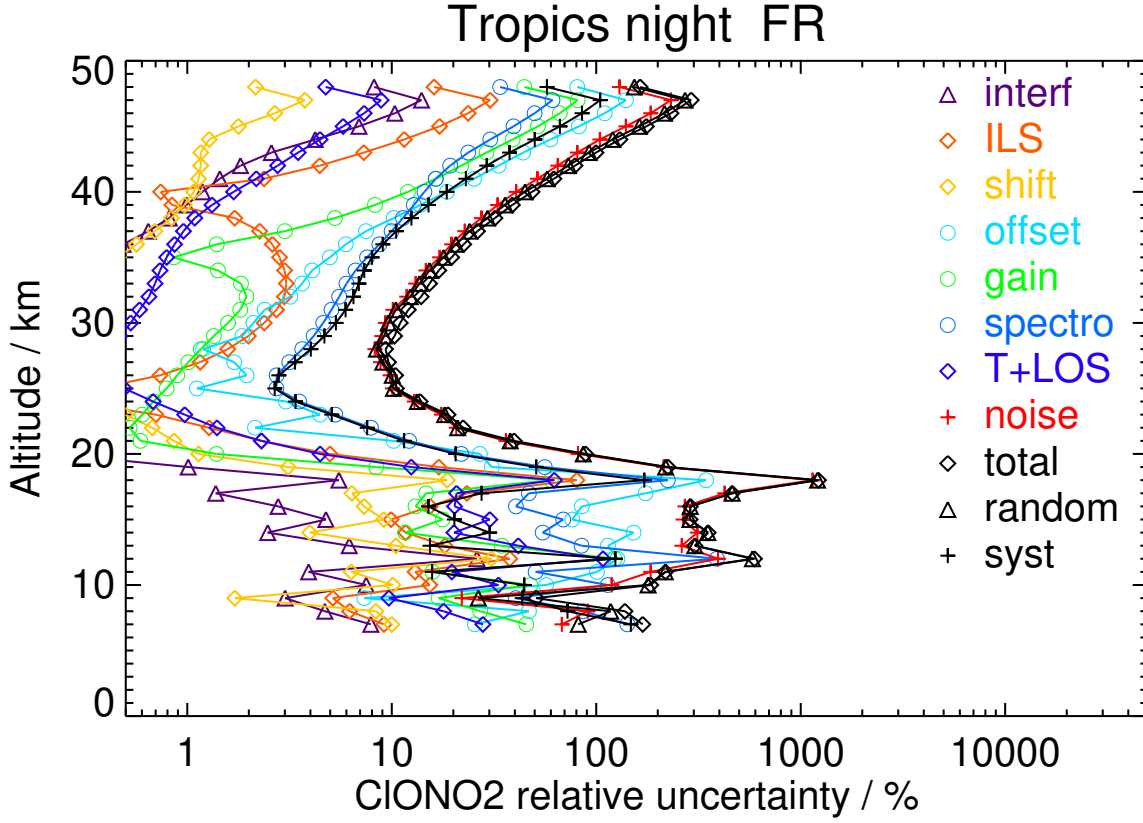


Figure S18: V8H_CLONO2_61 Tropics night

Table S23: CIONO2 error budget for Southern midlatitude winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-9.41	0.56	1.19	0.60	6.33	1.64	6.42	2.84	13.13	16.25	1.61	16.33
10	26.87	0.23	2.06	0.36	9.27	2.21	9.67	2.68	18.51	23.12	2.08	23.21
13	70.27	0.10	4.50	0.36	11.52	3.14	15.41	2.76	24.63	31.69	3.27	31.86
16	190.21	0.13	7.91	0.51	13.75	2.25	20.43	4.16	33.20	39.30	15.79	42.35
19	476.60	0.15	6.49	1.15	14.97	4.20	24.02	4.52	42.05	49.04	15.69	51.49
22	751.99	0.19	5.32	0.78	14.21	7.14	27.09	4.01	50.13	54.22	24.61	59.54
25	858.11	0.24	6.85	0.90	12.37	9.69	41.66	5.31	57.45	59.81	42.22	73.21
28	785.61	0.39	10.02	0.61	13.14	10.10	47.62	6.26	64.36	66.56	48.94	82.61
31	630.17	0.68	13.37	0.92	20.86	9.07	42.60	6.29	72.05	75.80	44.71	88.00
34	455.47	0.66	13.59	1.17	30.60	4.97	35.46	5.10	80.14	86.40	37.28	94.09
37	297.21	2.04	9.20	1.57	41.30	6.39	31.87	3.71	88.33	97.98	32.69	103.29
40	161.75	3.33	5.23	1.34	53.87	15.73	27.25	3.33	95.19	109.98	30.15	114.03
43	64.02	3.74	6.45	0.84	56.65	18.34	19.61	3.09	90.67	107.62	25.19	110.53
46	-3.05	3.29	8.09	0.93	39.63	17.18	9.27	2.51	62.52	74.34	20.46	77.10

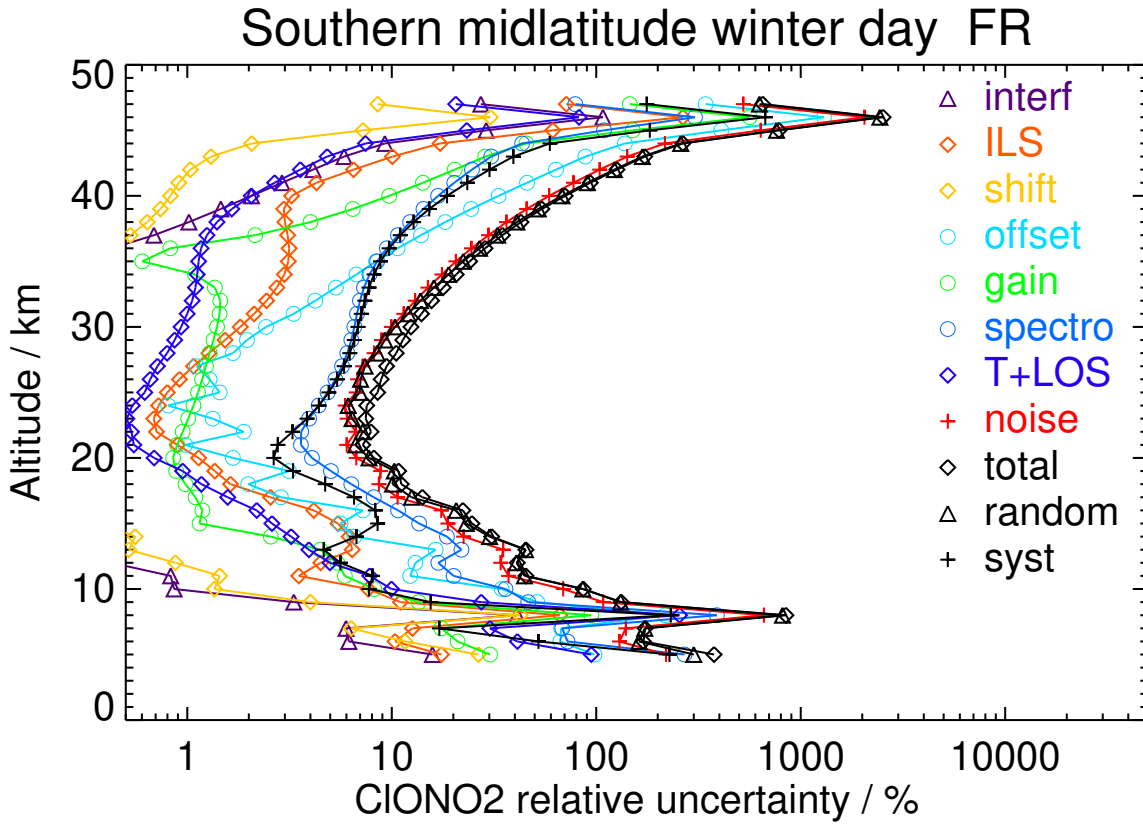


Figure S19: V8H_CLONO2_61 Southern midlatitude winter day

Table S24: CIONO2 error budget for Southern midlatitude winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-12.76	0.82	0.96	0.83	4.67	1.76	8.01	4.29	11.80	15.03	4.81	15.78
10	24.89	0.39	0.89	0.62	7.36	1.23	6.71	3.14	16.39	19.11	3.94	19.51
13	45.49	0.11	2.33	0.33	9.74	1.25	8.39	2.68	22.72	26.31	1.88	26.38
16	151.27	0.15	6.77	0.63	12.02	1.84	21.21	4.36	31.22	36.09	18.31	40.47
19	501.77	0.14	7.05	1.10	13.66	4.08	25.48	5.01	40.78	45.78	22.26	50.91
22	883.04	0.17	5.09	0.85	13.49	8.17	28.70	4.10	49.66	54.10	25.60	59.85
25	1002.64	0.28	8.23	0.82	12.46	10.84	46.35	5.95	57.25	60.07	46.84	76.17
28	911.57	0.48	11.44	0.75	13.31	10.64	51.98	6.71	63.86	66.26	53.44	85.13
31	779.63	0.78	14.72	1.08	20.23	9.81	47.17	6.55	71.13	74.96	49.33	89.73
34	646.97	0.86	15.40	1.53	29.87	6.23	41.87	5.48	79.61	85.77	44.01	96.40
37	468.37	1.89	11.24	1.94	40.52	6.08	40.54	4.36	87.57	97.06	41.49	105.56
40	285.85	3.24	7.17	1.66	53.34	15.21	37.08	3.74	94.68	109.30	39.34	116.17
43	141.69	4.00	5.32	0.99	56.48	17.13	27.70	2.94	90.64	107.39	31.45	111.90
46	57.61	3.73	5.59	0.89	39.87	15.23	13.91	1.97	62.85	74.80	20.48	77.55

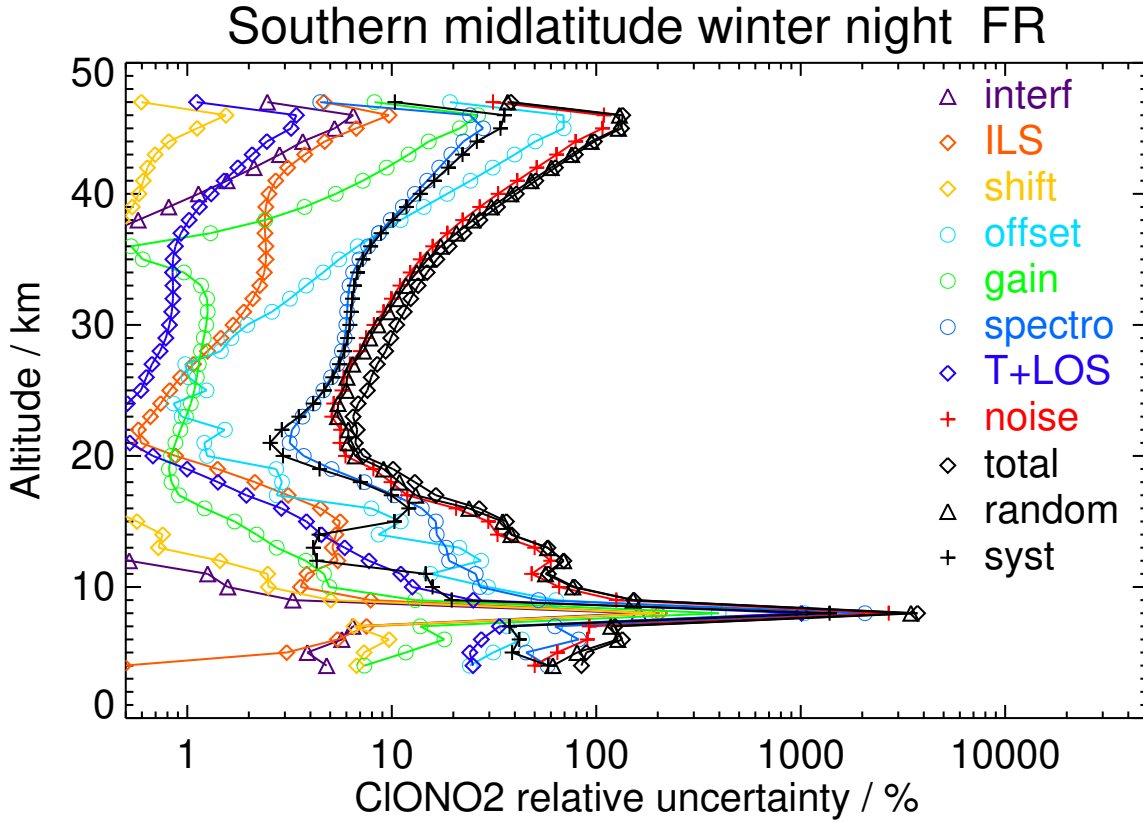


Figure S20: V8H_CLONO2.61 Southern midlatitude winter night

Table S25: CIONO2 error budget for Southern midlatitude spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-25.05	0.64	1.16	1.16	8.61	1.82	5.87	3.68	16.63	19.91	2.96	20.13
10	17.65	0.34	1.53	0.51	8.89	1.15	5.63	2.80	18.35	21.42	0.79	21.43
13	23.48	0.16	2.96	0.43	9.93	0.81	8.84	2.62	22.98	26.82	1.53	26.86
16	130.91	0.12	9.06	0.85	10.93	1.82	19.30	4.00	30.08	34.40	17.75	38.71
19	446.65	0.14	8.59	1.49	10.98	3.65	24.09	4.35	37.18	42.46	19.71	46.81
22	748.98	0.14	6.48	1.17	10.10	7.78	25.36	3.77	44.26	47.53	23.73	53.12
25	799.33	0.17	9.71	0.84	9.50	9.59	40.04	5.05	51.07	53.88	40.13	67.19
28	686.27	0.23	13.59	1.34	10.34	9.00	42.82	5.35	57.61	59.99	44.23	74.54
31	461.53	0.47	16.03	1.47	15.47	8.02	35.59	4.62	64.36	66.80	39.13	77.42
34	215.78	0.70	14.67	1.33	23.14	5.76	24.03	3.03	72.30	76.22	28.13	81.24
37	61.47	1.69	6.86	1.79	27.61	7.36	17.34	2.01	76.92	82.04	18.95	84.20
40	-16.45	2.43	3.93	1.80	38.61	21.26	14.29	3.43	81.20	90.34	24.83	93.69
43	-50.91	3.37	9.72	0.74	48.37	27.27	12.67	4.15	84.36	97.70	30.64	102.39
46	-40.77	3.23	9.00	0.84	39.55	20.77	9.92	2.94	63.17	74.88	24.05	78.64

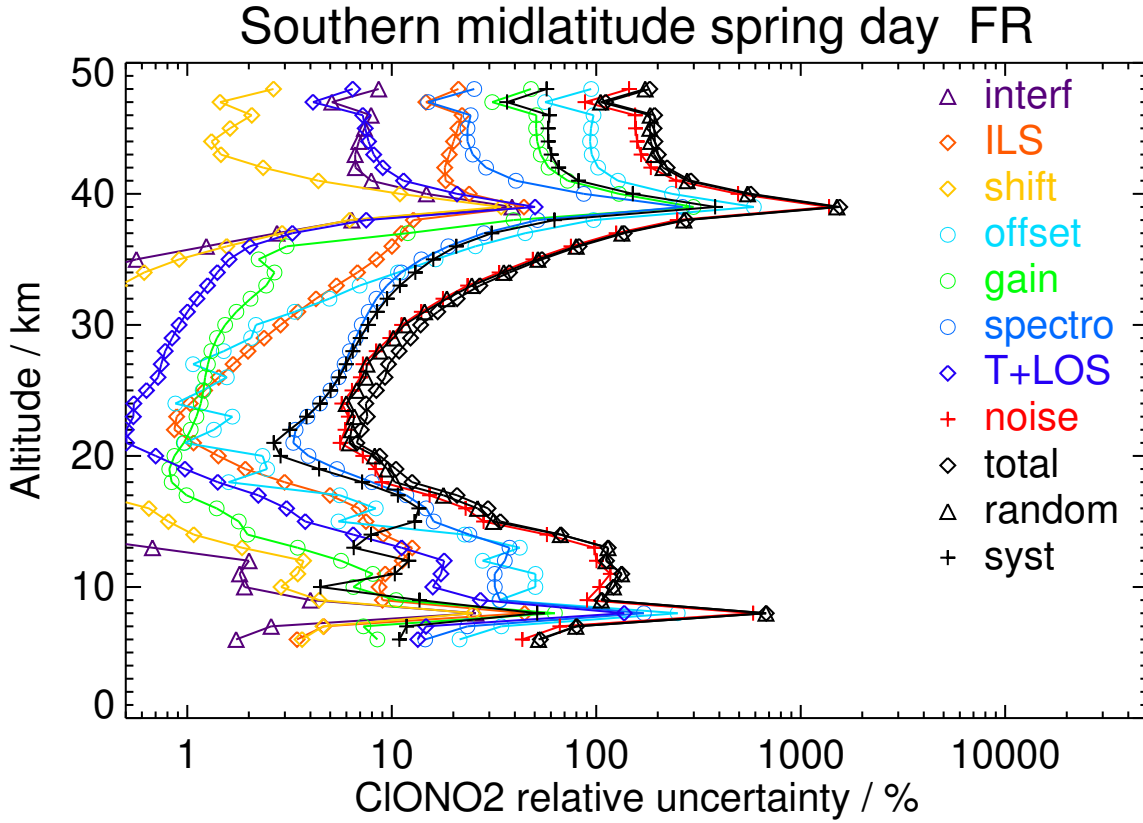


Figure S21: V8H_CLONO2_61 Southern midlatitude spring day

Table S26: CIONO2 error budget for Southern midlatitude spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-24.37	0.35	0.60	0.71	7.75	1.73	2.85	2.16	14.38	16.77	1.51	16.84
10	19.96	0.17	0.92	0.35	9.83	1.11	3.97	2.27	19.12	22.02	0.60	22.03
13	24.28	0.13	1.50	0.29	11.12	1.22	4.79	2.72	23.64	26.69	2.11	26.77
16	164.95	0.13	8.77	0.88	12.26	1.52	18.06	4.19	30.09	34.14	17.72	38.47
19	458.21	0.14	5.46	1.19	12.31	3.33	18.67	3.55	36.73	40.30	16.75	43.64
22	758.03	0.14	5.13	0.99	11.22	7.88	22.96	3.15	43.29	45.88	22.84	51.25
25	867.43	0.18	8.61	0.51	9.75	10.93	36.48	4.26	49.37	51.06	38.32	63.84
28	834.78	0.27	12.23	1.01	9.64	11.39	40.78	4.63	56.11	57.40	43.73	72.15
31	758.41	0.55	15.27	1.03	14.16	11.45	39.87	4.55	62.99	65.05	43.74	78.39
34	616.89	0.73	16.08	1.13	22.71	9.80	36.40	4.29	71.85	75.72	40.55	85.89
37	440.47	1.52	11.03	1.57	29.34	3.47	34.99	3.44	78.32	83.92	36.43	91.48
40	259.45	2.68	4.05	1.73	41.05	17.27	31.89	3.21	83.40	93.33	35.82	99.97
43	108.56	3.18	4.25	0.87	50.57	24.28	24.69	3.37	85.42	99.65	34.11	105.32
46	31.56	2.74	5.66	0.61	41.29	19.31	15.67	2.48	64.04	76.47	24.94	80.44

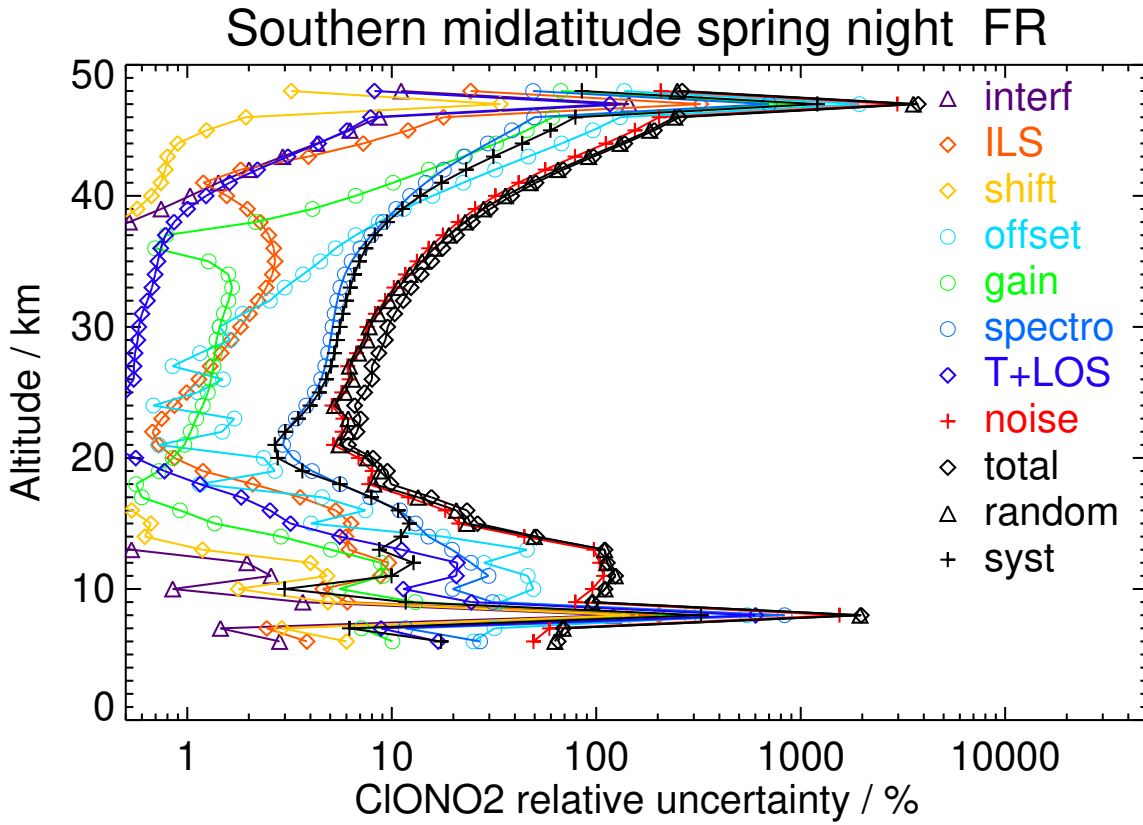


Figure S22: V8H_CLONO2.61 Southern midlatitude spring night

Table S27: CIONO2 error budget for Southern midlatitude summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-4.77	0.80	0.97	0.92	5.45	2.42	10.18	3.01	11.89	16.84	2.95	17.10
10	-1.95	0.33	0.74	0.58	8.12	1.58	6.28	2.44	17.64	20.40	3.11	20.64
13	11.64	0.09	1.30	0.15	10.16	0.94	4.27	2.05	23.30	25.85	1.75	25.91
16	48.74	0.14	4.28	0.27	12.11	0.79	9.66	3.01	31.19	34.32	7.95	35.23
19	239.29	0.13	7.85	0.75	13.39	0.97	18.45	3.97	39.84	42.74	18.95	46.75
22	564.50	0.17	2.16	1.08	13.46	4.22	15.96	2.76	47.61	50.09	15.02	52.29
25	773.79	0.19	7.30	0.68	12.24	9.36	27.91	3.75	53.54	55.26	29.94	62.85
28	737.51	0.26	14.29	1.21	11.96	10.98	40.75	5.09	59.46	61.05	44.32	75.44
31	475.13	0.50	17.83	1.61	15.83	9.53	35.76	4.64	65.55	67.81	40.75	79.11
34	226.33	0.70	15.19	1.58	21.11	5.83	22.86	2.80	72.48	75.69	27.71	80.61
37	76.63	2.12	7.13	2.37	22.61	9.59	18.50	2.16	75.73	79.25	21.58	82.14
40	23.65	2.66	1.03	3.39	31.14	25.19	18.66	3.62	76.52	83.02	30.79	88.55
43	-5.76	3.37	5.92	2.33	41.52	31.70	18.92	4.05	81.12	91.58	36.73	98.67
46	-15.48	3.69	6.61	0.72	36.66	24.53	15.58	2.72	62.52	72.83	29.31	78.50
49	-20.62	3.31	5.19	0.37	27.76	16.27	10.90	1.64	44.77	52.91	19.97	56.56

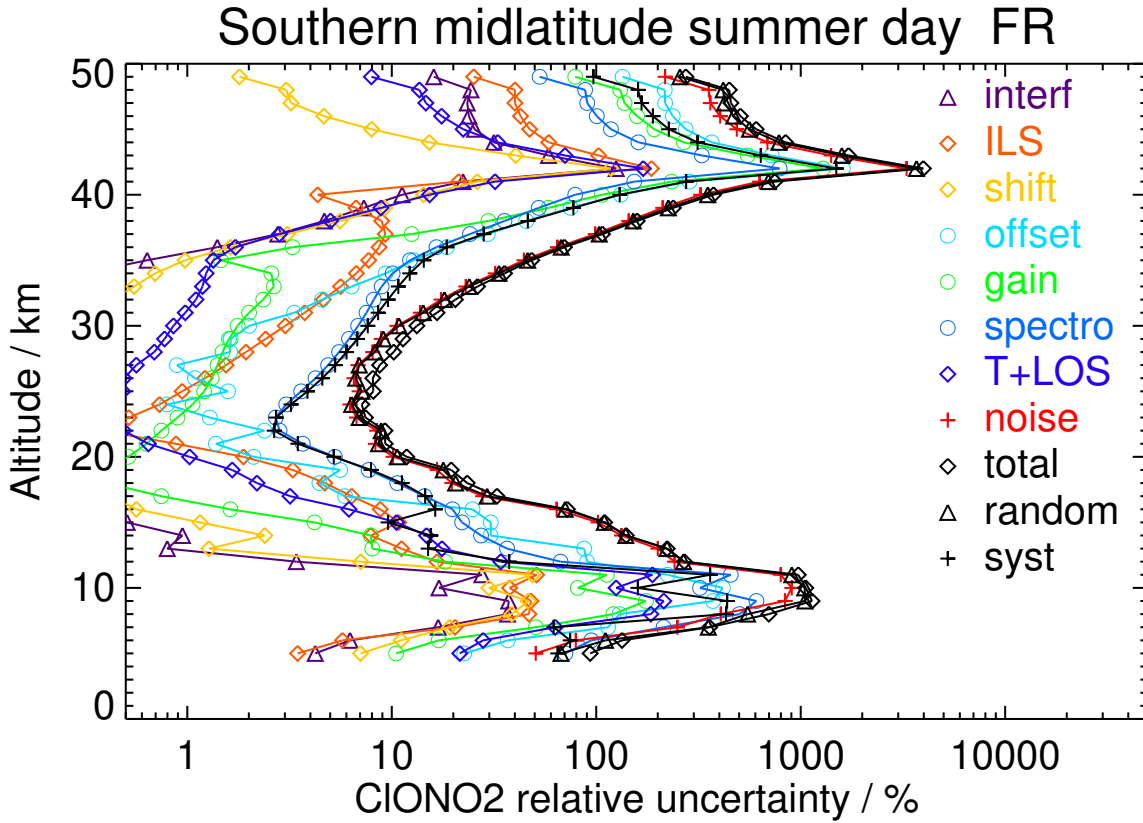


Figure S23: V8H_CLONO2_61 Southern midlatitude summer day

Table S28: CIONO2 error budget for Southern midlatitude summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-10.12	0.96	1.39	0.85	4.80	1.70	7.35	3.95	11.52	14.40	4.93	15.22
10	-3.82	0.52	0.97	0.64	5.39	1.23	4.70	2.84	13.46	15.54	1.43	15.60
13	10.32	0.31	1.32	0.40	7.86	0.58	4.20	2.55	20.10	22.12	1.64	22.19
16	26.76	0.17	4.93	0.40	10.35	0.92	10.08	3.19	28.48	31.15	9.24	32.49
19	248.13	0.18	9.46	0.91	12.39	0.78	22.33	4.54	38.02	40.78	23.37	47.00
22	630.47	0.25	2.35	1.21	12.80	4.59	18.75	3.12	46.31	49.04	17.13	51.94
25	903.10	0.32	6.53	0.64	11.68	10.54	29.24	3.88	52.42	54.21	31.14	62.52
28	994.26	0.42	15.48	1.05	11.49	13.96	43.78	5.54	58.55	60.29	48.05	77.09
31	836.68	0.62	22.21	1.74	15.89	13.67	45.59	6.06	65.05	67.54	52.16	85.34
34	576.32	0.85	19.46	1.90	21.25	9.08	37.67	4.66	71.75	75.19	43.03	86.64
37	319.83	2.24	9.51	2.11	21.90	8.25	32.12	3.15	74.58	78.03	34.11	85.16
40	134.66	2.47	1.16	2.85	30.11	24.93	27.78	3.36	75.67	81.83	36.84	89.74
43	24.40	3.49	6.46	1.83	40.62	31.84	23.77	3.63	80.33	90.44	39.64	98.75
46	-19.84	4.19	7.05	0.49	36.49	24.93	17.90	2.46	62.80	73.00	31.02	79.31
49	-33.24	3.47	5.38	0.26	27.43	16.71	12.25	1.58	44.68	52.68	21.13	56.76

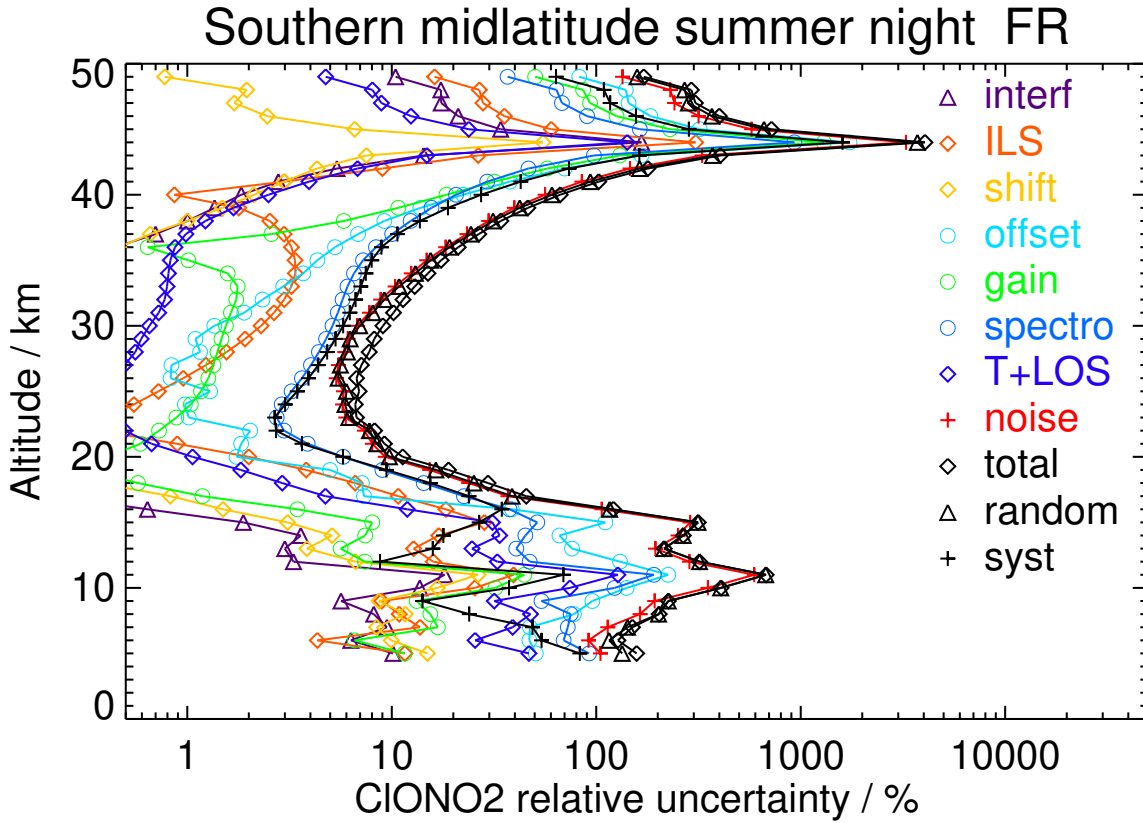


Figure S24: V8H.CLONO2_61 Southern midlatitude summer night

Table S29: CLONO2 error budget for Southern midlatitude autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-3.43	1.26	0.97	2.06	10.13	3.14	14.38	6.53	19.19	25.80	8.45	27.15
10	-0.70	0.61	0.98	0.63	5.35	1.82	6.22	3.82	12.71	15.27	3.90	15.76
13	13.24	0.33	2.12	0.39	4.82	1.31	6.20	2.65	15.80	17.62	3.78	18.02
16	94.22	0.12	4.84	0.56	4.97	1.04	12.22	2.76	21.97	23.92	10.80	26.25
19	312.48	0.15	5.03	1.37	5.91	2.84	20.10	3.01	29.98	33.45	16.23	37.17
22	616.84	0.12	2.35	0.85	7.04	4.69	18.48	2.77	39.42	41.51	16.05	44.51
25	828.52	0.16	5.35	0.35	7.98	7.74	30.80	3.54	48.54	49.81	31.44	58.90
28	808.35	0.29	11.01	0.55	10.45	9.23	43.11	4.97	56.34	57.80	45.08	73.30
31	632.63	0.61	14.25	0.75	17.20	9.30	42.26	5.47	64.96	67.67	45.21	81.38
34	401.04	0.79	11.79	1.22	22.74	4.17	35.64	4.26	72.16	76.02	37.31	84.68
37	233.86	1.90	6.27	1.60	32.87	8.34	30.85	2.92	78.27	85.19	32.00	91.01
40	111.52	2.73	2.54	1.28	48.19	16.72	24.90	2.58	87.88	100.55	29.26	104.72
43	32.92	2.96	3.49	0.94	51.95	18.66	18.37	2.50	86.35	101.11	25.40	104.25
46	0.75	2.57	4.21	0.89	40.20	14.70	11.46	1.86	62.41	74.49	18.41	76.73

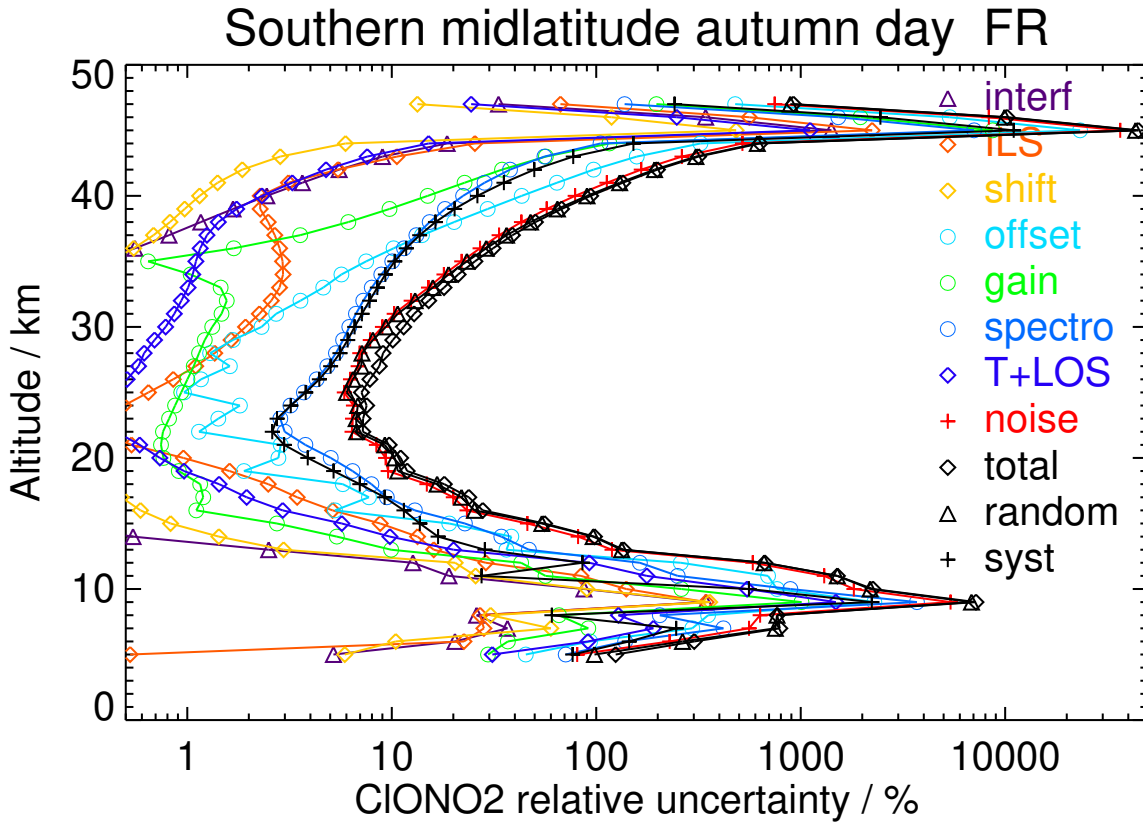


Figure S25: V8H.CLONO2.61 Southern midlatitude autumn day

Table S30: CIONO2 error budget for Southern midlatitude autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-3.02	1.24	1.09	2.27	9.95	2.25	14.17	6.03	18.70	24.67	9.53	26.44
10	-9.15	0.68	1.04	0.94	7.98	2.16	8.41	4.05	15.88	19.51	5.40	20.25
13	7.46	0.37	1.37	0.59	6.88	1.18	5.26	2.84	17.86	19.86	3.35	20.14
16	56.96	0.15	4.73	0.67	5.66	0.94	10.87	2.72	23.21	25.19	9.24	26.83
19	278.22	0.16	4.62	1.29	4.59	1.56	21.98	3.26	30.04	31.68	20.96	37.98
22	652.35	0.14	1.42	1.07	5.21	4.22	19.64	3.19	38.99	40.37	18.28	44.32
25	964.47	0.23	4.93	0.61	6.61	8.96	31.00	3.62	48.11	49.38	31.60	58.63
28	1013.58	0.39	12.41	0.60	9.83	11.48	47.71	5.45	56.10	57.47	50.33	76.40
31	866.14	0.70	16.94	0.99	17.22	12.01	51.05	6.39	64.84	67.65	54.80	87.06
34	648.90	0.90	14.42	1.33	22.70	6.41	46.43	5.44	72.22	76.09	48.76	90.38
37	448.79	2.05	7.96	1.75	31.48	8.36	41.12	4.07	77.99	84.47	42.26	94.45
40	261.82	2.60	3.60	1.48	46.49	18.48	33.32	3.26	86.59	98.80	37.16	105.56
43	113.09	2.88	4.47	1.00	51.32	21.46	23.90	2.86	86.53	101.14	31.01	105.78
46	14.03	2.81	5.38	0.98	39.77	17.42	14.13	2.06	62.50	74.44	22.19	77.67

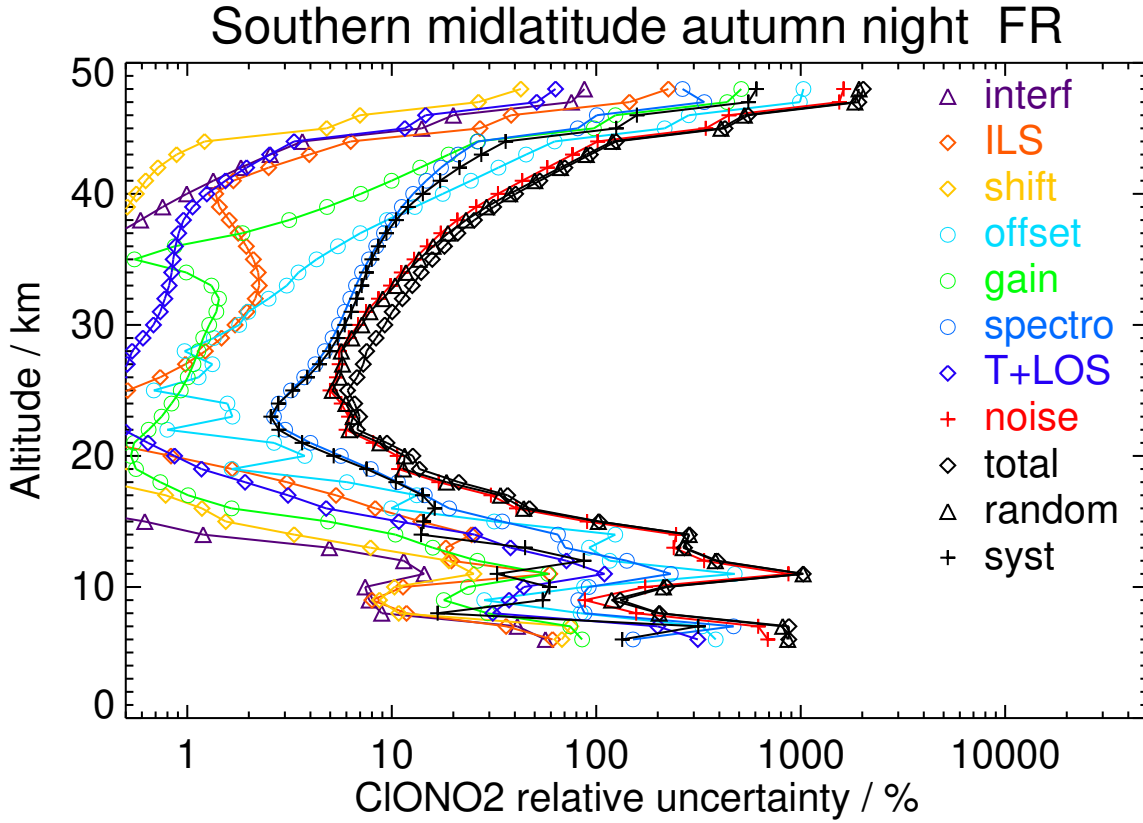


Figure S26: V8H_CLONO2_61 Southern midlatitude autumn night

Table S31: CIONO2 error budget for Southern polar winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-12.77	0.82	0.56	0.71	4.58	0.88	6.88	4.68	10.54	13.08	5.70	14.27
10	55.50	0.20	2.55	0.28	7.51	0.88	12.79	2.76	15.42	20.23	7.95	21.74
13	165.66	0.14	2.86	0.28	12.60	1.88	12.28	3.33	27.48	32.56	5.25	32.98
16	176.29	0.09	7.03	0.59	16.41	2.79	27.76	5.18	40.18	51.60	8.74	52.34
19	324.61	0.13	11.14	3.08	17.48	4.23	52.98	10.94	51.22	60.32	48.67	77.51
22	1267.80	0.20	5.91	3.61	15.07	10.13	44.62	10.24	60.43	72.14	30.36	78.27
25	1496.68	0.36	14.45	2.09	13.45	14.46	87.53	12.43	67.31	79.06	81.85	113.79
28	1110.77	0.67	22.01	2.26	18.52	12.84	88.45	14.98	72.51	79.16	89.65	119.59
31	778.95	0.87	22.70	2.02	28.47	9.01	64.70	11.90	78.86	85.21	68.55	109.36
34	552.37	0.80	18.31	1.06	38.58	2.55	45.72	7.85	86.47	95.25	48.87	107.05
37	355.66	3.14	9.15	0.98	49.38	9.77	34.65	4.74	94.90	107.37	36.46	113.39
40	182.90	4.44	4.47	0.91	60.79	18.91	26.36	3.90	101.72	118.97	31.60	123.09
43	58.48	4.14	7.40	0.71	60.81	19.70	17.96	3.46	93.39	111.87	26.49	114.96

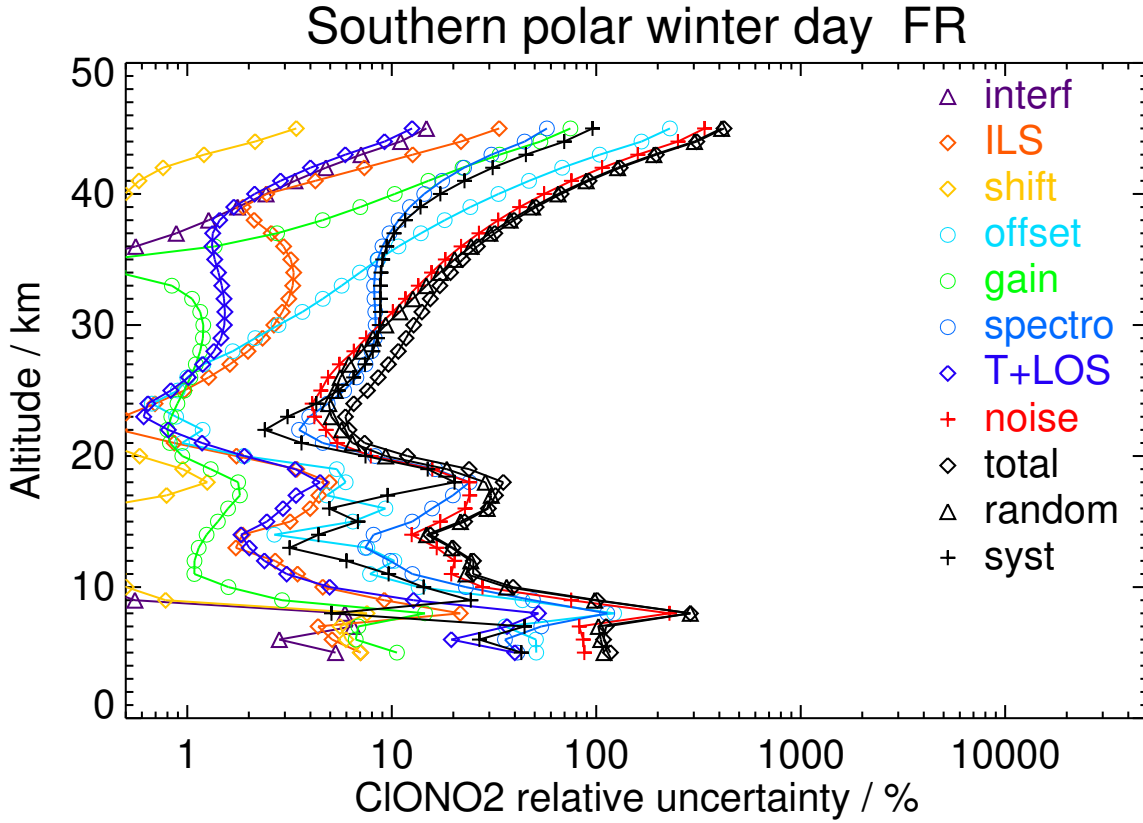


Figure S27: V8H_CLONO2_61 Southern polar winter day

Table S32: CLONO2 error budget for Southern polar winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-7.35	0.80	0.77	0.81	6.37	1.51	6.15	5.50	13.18	16.47	3.94	16.93
10	32.58	0.45	1.57	0.50	6.31	1.45	9.28	3.63	14.64	17.93	6.07	18.94
13	123.80	0.18	3.10	0.32	9.78	1.24	11.48	3.17	23.48	27.76	5.44	28.29
16	199.57	0.12	4.98	0.48	13.25	3.30	20.56	3.49	34.57	42.45	6.27	42.91
19	264.12	0.14	7.46	1.24	15.30	3.30	29.86	4.97	46.89	54.07	22.22	58.46
22	767.97	0.20	6.63	2.22	14.94	7.10	40.19	7.92	57.07	68.45	23.92	72.51
25	1233.38	0.43	9.36	1.66	14.04	11.81	61.69	8.38	66.44	81.97	44.70	93.36
28	1219.52	0.80	18.72	0.98	19.24	12.85	75.17	10.88	74.20	83.68	71.82	110.28
31	974.18	1.02	23.90	1.16	30.59	10.13	69.37	11.70	81.35	89.03	72.48	114.80
34	713.07	0.94	22.30	1.39	42.87	4.21	56.88	9.51	89.26	99.72	60.86	116.83
37	478.67	2.89	14.95	1.69	54.95	6.91	46.86	6.49	98.45	113.19	49.21	123.42
40	274.53	4.28	7.81	1.40	65.60	14.91	37.20	4.56	104.57	123.96	39.75	130.18
43	125.22	4.10	5.22	0.79	63.65	16.10	25.05	3.34	94.34	114.29	28.84	117.87

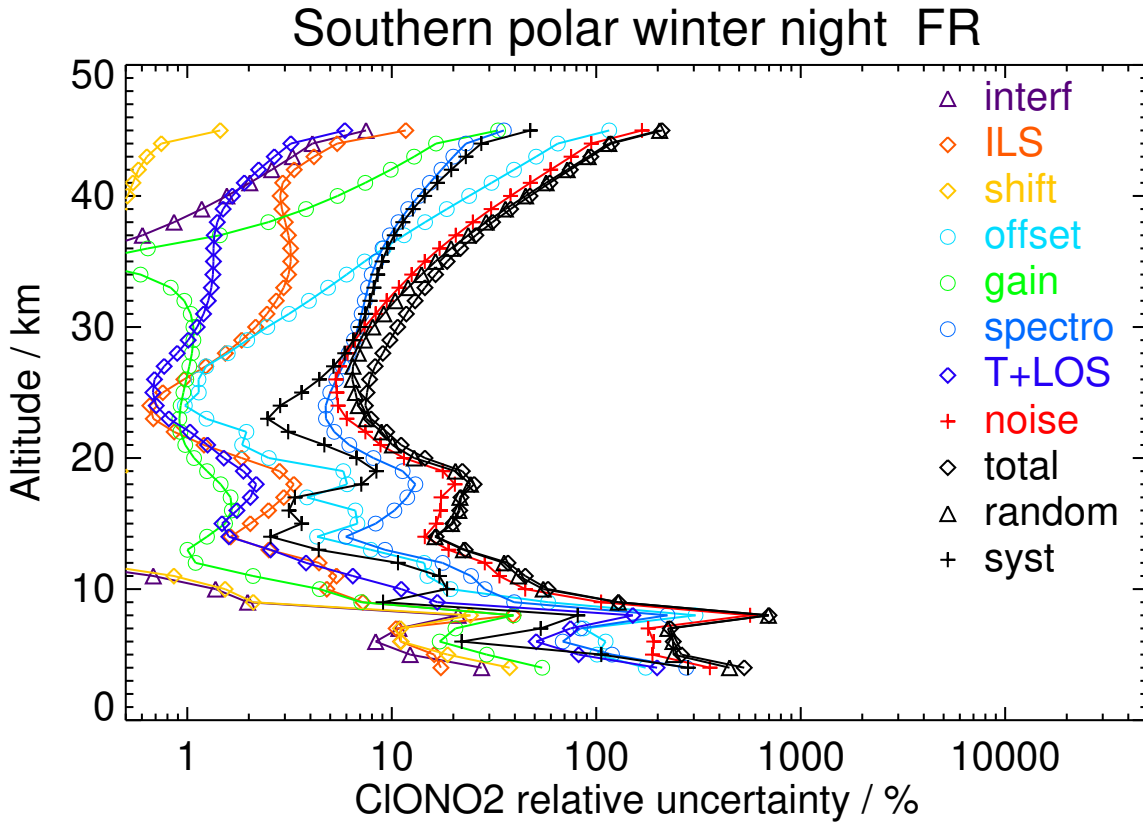


Figure S28: V8H_CLONO2.61 Southern polar winter night

Table S33: CLONO2 error budget for Southern polar spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-22.94	0.28	3.00	0.62	8.92	0.94	5.19	3.28	16.97	20.31	1.72	20.38
10	32.67	0.14	4.46	0.48	10.75	1.09	7.71	2.32	22.69	25.81	7.08	26.77
13	77.77	0.10	5.59	0.61	11.53	0.56	9.59	2.12	29.44	32.14	9.76	33.59
16	-37.90	0.10	7.38	1.06	10.26	1.29	11.49	2.80	36.97	39.62	9.96	40.85
19	342.56	0.16	17.91	3.29	7.91	5.13	32.30	7.00	42.71	44.54	36.79	57.77
22	917.68	0.21	4.47	1.84	6.29	8.74	24.24	4.69	47.87	49.62	24.03	55.14
25	915.86	0.23	17.01	2.85	6.51	8.98	48.18	7.20	53.62	54.96	51.47	75.30
28	578.21	0.27	18.41	2.62	8.72	5.77	41.26	6.12	58.58	60.20	44.75	75.01
31	290.96	0.56	15.48	1.67	15.10	4.71	24.39	3.16	64.95	66.96	28.87	72.91
34	109.11	1.14	11.35	2.20	21.29	4.33	13.71	1.95	72.01	75.34	17.54	77.35
37	32.93	1.87	4.06	3.22	23.79	14.50	10.24	2.83	75.50	79.61	16.79	81.36
40	-7.65	2.70	7.72	3.01	33.45	29.06	11.18	4.15	79.23	86.49	31.28	91.98
43	-29.67	4.71	14.24	1.21	43.95	35.05	12.69	4.48	82.87	94.37	39.12	102.16
46	-28.76	4.72	12.90	0.80	37.89	26.42	10.55	3.14	64.79	75.51	30.69	81.50
49	-34.99	3.53	9.52	1.14	28.09	17.21	8.79	2.13	43.63	52.17	21.29	56.35

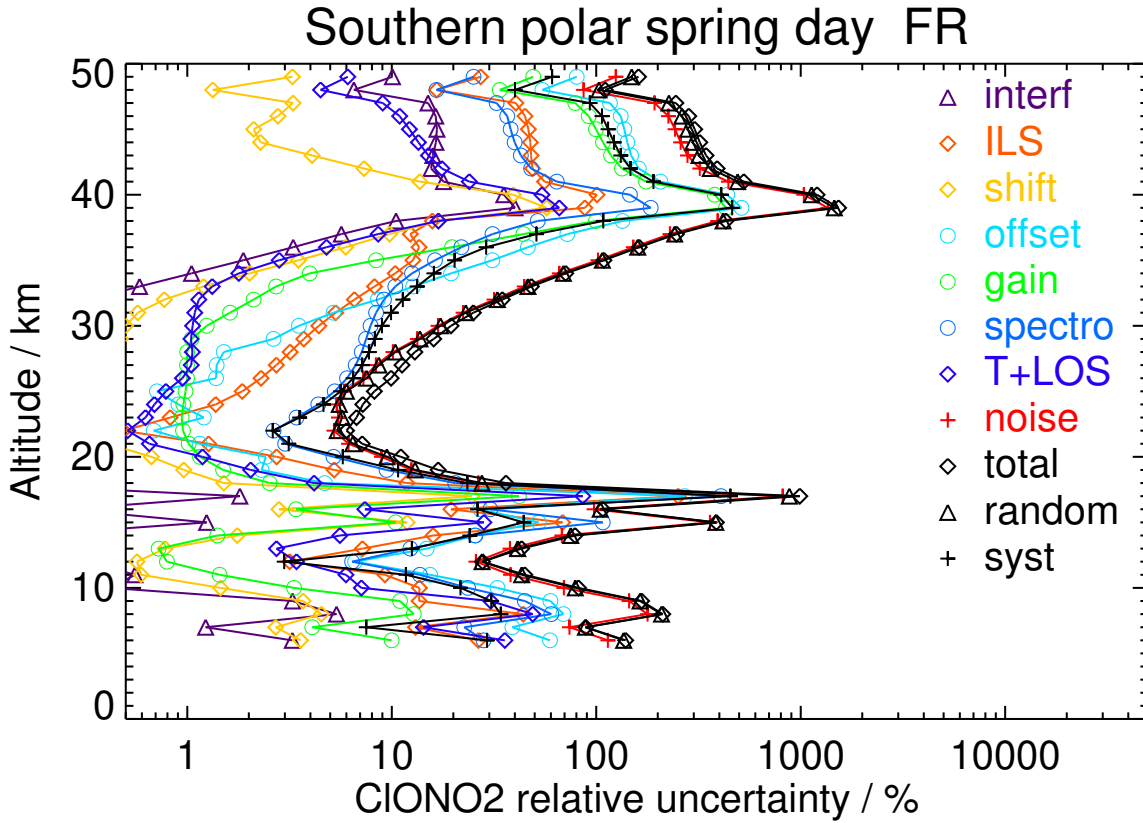


Figure S29: V8H.CLONO2_61 Southern polar spring day

Table S34: CLONO2 error budget for Southern polar spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-18.16	0.32	2.43	0.54	7.85	1.33	5.55	2.67	14.62	17.91	0.82	17.93
10	31.15	0.21	5.07	0.51	10.94	1.62	10.53	3.23	21.63	26.77	4.55	27.16
13	85.39	0.22	6.86	0.80	13.44	1.47	14.76	3.04	30.12	36.84	2.83	36.94
16	124.79	0.20	11.20	1.56	13.74	1.43	18.65	3.96	38.13	44.45	12.64	46.22
19	471.42	0.22	19.59	4.76	12.15	6.38	39.47	7.88	44.44	56.07	32.34	64.73
22	1054.75	0.33	9.36	3.93	9.01	10.96	30.99	6.16	48.97	53.60	28.77	60.83
25	1111.67	0.42	16.74	2.51	7.89	12.40	54.15	7.97	53.94	57.33	55.87	80.05
28	903.43	0.44	20.52	3.17	9.79	10.89	51.85	7.53	59.46	62.13	55.37	83.22
31	667.39	0.65	20.21	1.96	16.50	9.31	39.71	5.26	65.50	68.28	44.76	81.64
34	398.99	1.08	17.26	1.60	23.79	5.64	30.08	3.48	73.27	77.69	33.89	84.76
37	206.27	1.95	6.68	2.86	27.11	11.71	24.56	3.04	77.54	83.09	25.48	86.91
40	102.29	2.97	7.40	2.97	36.96	26.40	21.15	3.87	81.68	90.72	32.21	96.27
43	35.40	4.53	13.87	1.35	46.81	31.41	17.75	3.94	84.23	97.26	36.85	104.00
46	4.17	4.13	12.00	0.96	38.95	23.16	12.20	2.69	64.19	75.65	27.71	80.57

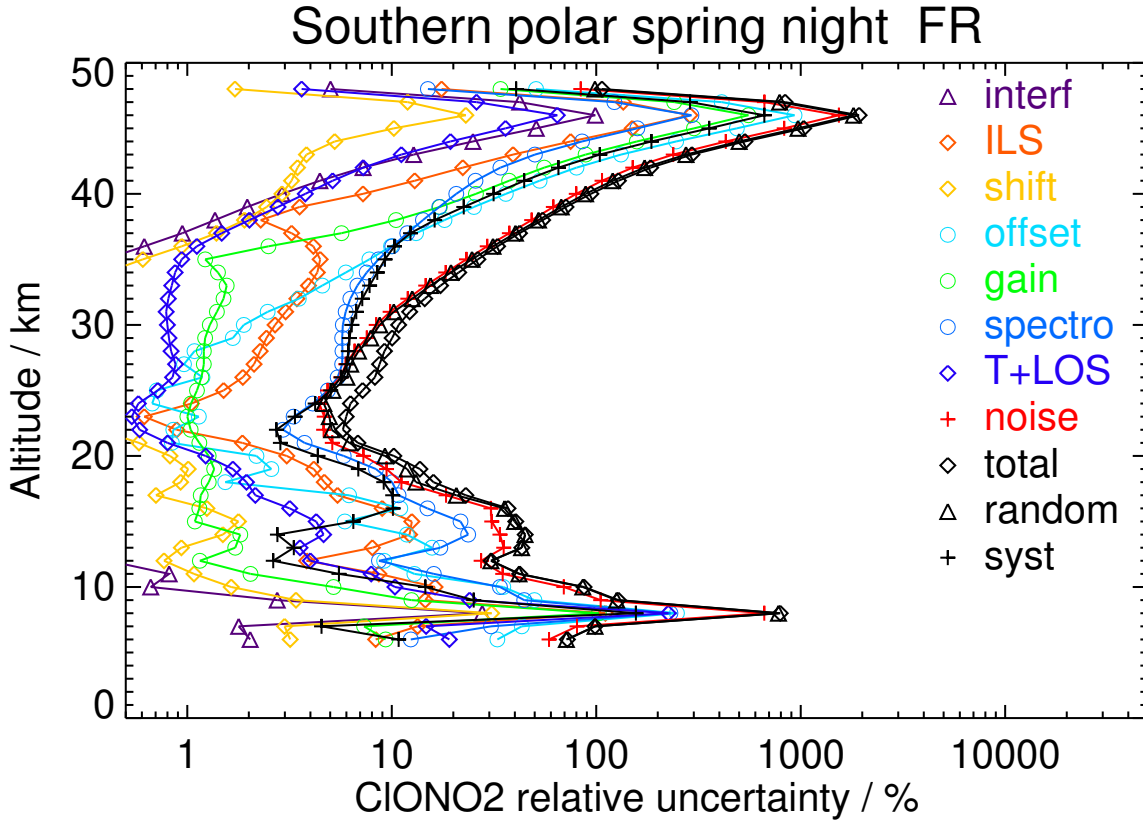


Figure S30: V8H_CLONO2.61 Southern polar spring night

Table S35: CLONO2 error budget for Southern polar summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	1.75	0.66	0.96	0.57	4.36	2.06	5.06	3.40	11.07	13.20	3.22	13.59
10	-1.62	0.22	0.59	0.48	7.71	1.76	3.58	2.53	17.30	19.44	1.88	19.53
13	10.67	0.11	1.14	0.16	9.78	0.38	2.91	2.10	23.11	25.36	1.09	25.38
16	69.51	0.16	6.05	0.33	11.84	0.91	11.69	3.15	30.62	33.29	12.38	35.52
19	274.13	0.16	3.34	0.79	13.22	1.73	12.03	2.41	39.14	42.01	10.35	43.27
22	408.77	0.17	5.19	0.63	13.38	5.09	16.55	1.69	46.35	48.69	16.92	51.55
25	369.31	0.19	5.86	0.83	12.24	5.57	17.94	1.97	52.56	54.49	18.30	57.48
28	411.89	0.24	7.63	0.65	11.43	5.53	18.81	1.92	58.40	59.98	19.76	63.15
31	339.79	0.48	10.71	1.26	14.58	6.08	18.92	1.96	63.99	65.88	21.97	69.45
34	186.30	0.74	11.24	1.17	20.82	5.39	14.10	1.51	70.75	73.89	18.37	76.14
37	82.59	2.04	6.68	2.50	21.84	9.27	15.15	2.17	74.06	77.43	18.45	79.60
40	44.23	2.96	2.24	4.42	27.77	26.32	20.93	3.78	75.28	80.77	33.06	87.27
43	13.81	3.65	3.32	3.72	38.73	33.15	23.10	4.02	79.37	88.90	39.80	97.40
46	-6.51	3.67	4.85	1.59	35.98	25.35	18.02	2.64	63.08	73.00	30.96	79.29
49	-17.77	3.29	4.61	0.53	27.99	17.13	12.33	1.62	45.49	53.66	21.29	57.73

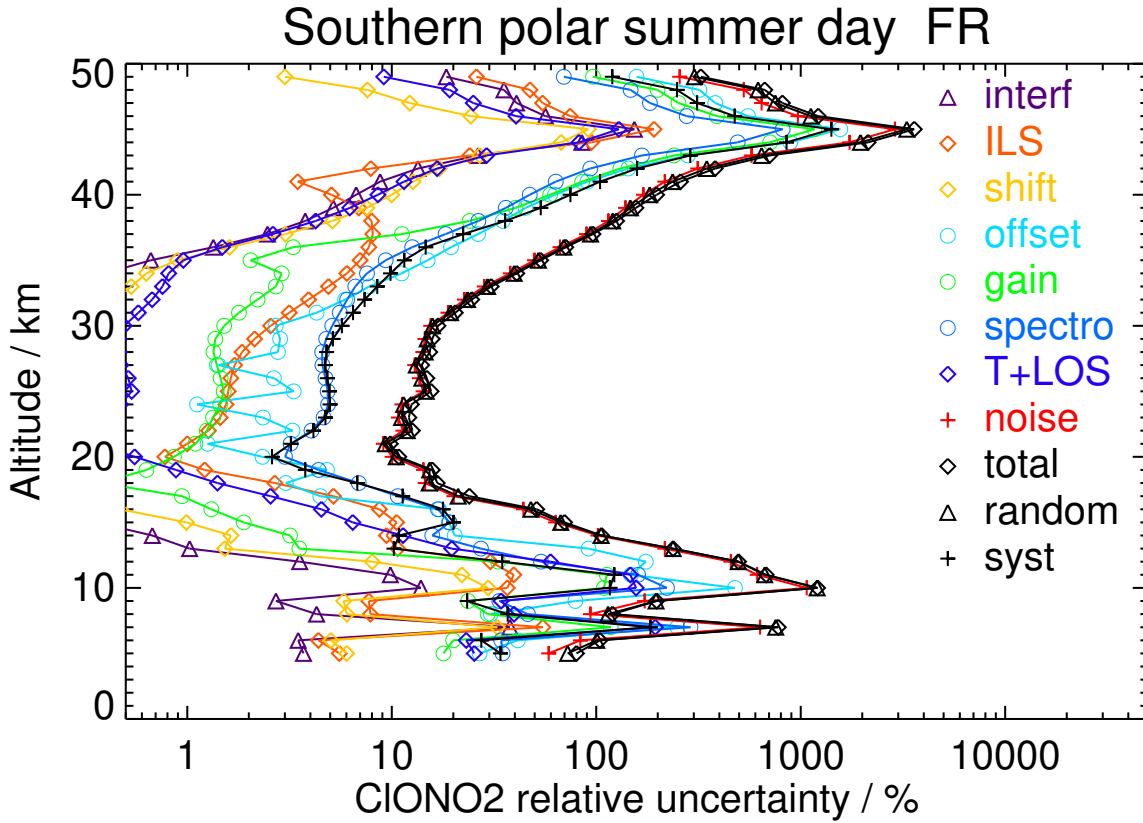


Figure S31: V8H_CLONO2.61 Southern polar summer day

Table S36: CIONO2 error budget for Southern polar summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-0.66	0.73	1.11	0.74	8.33	2.76	5.50	4.89	17.49	20.57	4.04	20.96
10	8.64	0.46	0.55	0.43	3.40	0.98	2.25	2.87	11.11	12.13	1.70	12.25
13	9.66	0.25	0.84	0.27	4.48	1.09	3.12	2.32	16.41	17.34	2.40	17.50
16	76.61	0.11	6.34	0.45	7.16	1.22	15.43	3.32	24.08	25.70	16.18	30.37
19	351.86	0.14	3.65	1.01	10.03	1.23	14.86	2.99	33.69	36.13	13.25	38.49
22	524.17	0.21	4.58	0.38	11.77	5.29	19.74	2.12	43.33	45.62	19.43	49.59
25	542.80	0.30	5.30	0.51	12.15	6.81	23.01	2.75	50.95	53.38	22.48	57.92
28	621.80	0.42	8.50	0.57	12.49	8.39	25.38	2.87	58.17	60.38	26.26	65.85
31	590.56	0.71	13.03	1.08	16.92	9.65	26.96	3.41	65.12	67.76	30.64	74.37
34	455.25	1.06	12.74	1.24	22.19	6.23	25.08	2.90	72.81	76.33	28.44	81.46
37	316.97	2.47	7.59	1.82	24.49	9.16	29.48	2.78	76.64	80.71	31.42	86.61
40	161.78	3.15	3.48	2.39	34.37	22.52	34.23	3.18	77.91	85.56	40.59	94.70
43	53.21	4.37	1.94	1.54	44.67	26.45	31.81	2.94	82.09	93.87	40.84	102.37
46	15.48	3.91	2.24	0.60	38.53	19.30	21.32	1.91	62.78	73.94	28.46	79.23
49	38.71	3.50	3.19	0.32	27.44	14.29	12.40	1.33	44.96	52.88	18.99	56.18

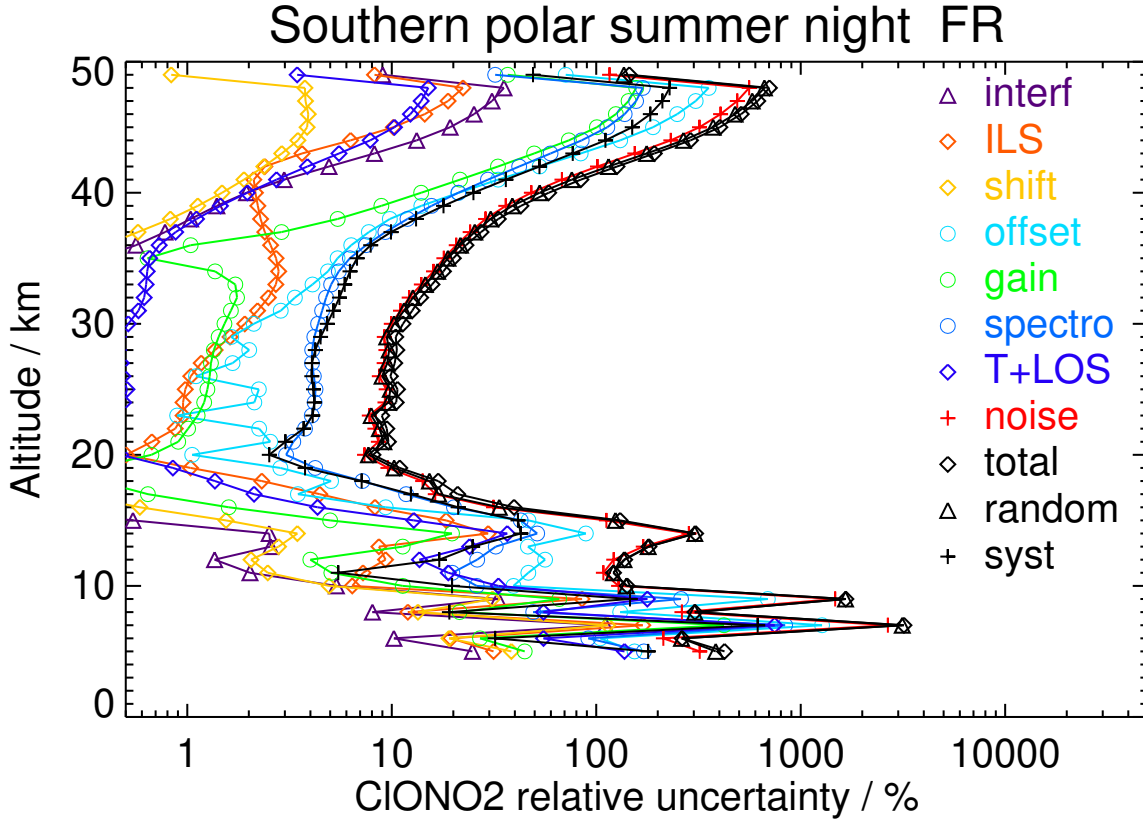


Figure S32: V8H_CLONO2_61 Southern polar summer night

Table S37: CLONO2 error budget for Southern polar autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-4.22	0.68	0.99	0.72	10.02	2.66	5.88	4.90	17.05	21.32	2.04	21.41
10	18.63	0.34	1.31	0.34	7.32	1.35	4.34	3.22	14.80	17.43	1.22	17.48
13	44.53	0.23	3.85	0.35	6.36	1.96	9.84	2.90	17.71	19.96	8.94	21.87
16	267.03	0.10	5.91	0.51	5.98	1.37	20.28	3.52	23.45	24.98	20.56	32.35
19	528.17	0.18	3.65	1.25	6.06	4.64	18.42	2.17	31.41	34.05	15.61	37.46
22	577.90	0.16	4.92	0.34	6.89	7.16	27.39	3.22	40.77	42.24	27.60	50.46
25	580.21	0.20	4.81	0.19	8.61	6.95	27.86	3.43	50.66	52.40	27.46	59.16
28	597.74	0.47	6.34	0.19	12.87	6.91	28.88	3.49	59.97	62.16	28.87	68.54
31	588.70	0.83	8.59	0.43	21.18	6.63	30.33	3.71	69.65	73.32	31.26	79.70
34	538.18	0.96	9.71	1.03	30.05	2.93	33.66	3.63	77.23	83.14	34.72	90.10
37	406.65	2.76	8.71	1.24	43.84	5.11	35.91	3.72	86.23	96.99	36.96	103.79
40	221.75	3.83	6.10	0.80	58.35	9.64	30.10	3.15	96.24	112.78	31.76	117.17
43	87.49	3.49	2.92	0.40	58.35	10.28	19.57	2.26	89.64	107.13	21.81	109.33
46	12.44	2.31	1.00	0.47	42.03	8.44	10.03	1.40	60.94	74.15	12.74	75.24

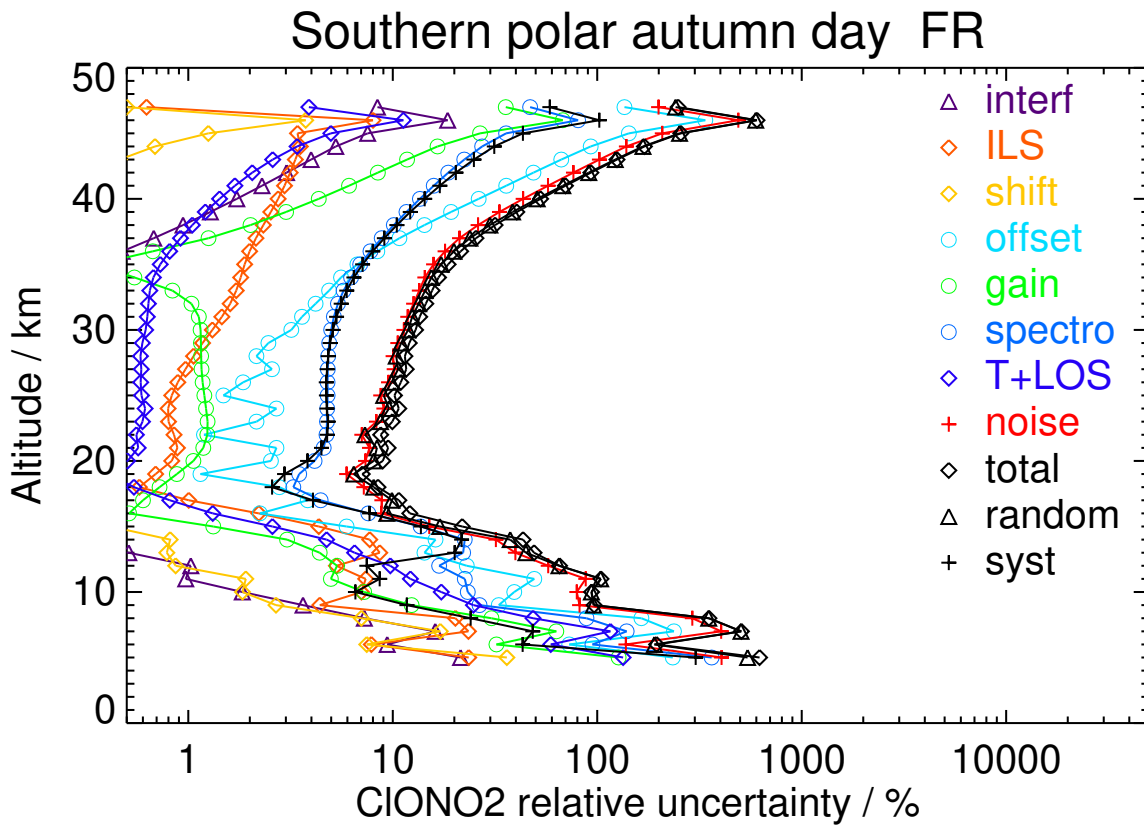


Figure S33: V8H.CLONO2.61 Southern polar autumn day

Table S38: CLONO2 error budget for Southern polar autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-3.03	0.83	1.12	0.88	7.55	3.15	7.54	5.68	14.79	19.09	3.62	19.43
10	15.35	0.38	1.23	0.56	5.45	2.16	5.76	3.48	13.26	15.91	2.09	16.05
13	47.14	0.20	3.48	0.44	5.75	1.63	10.67	2.97	17.21	20.18	7.71	21.61
16	271.79	0.13	6.68	0.73	7.06	1.50	23.70	4.41	24.20	26.45	23.76	35.56
19	579.43	0.15	5.73	1.18	9.27	5.65	22.29	2.83	34.20	39.00	17.50	42.74
22	611.05	0.16	6.24	0.50	11.36	7.64	31.04	3.93	44.56	47.49	30.59	56.49
25	629.52	0.26	4.74	0.30	12.20	7.11	30.91	3.76	54.63	56.83	30.76	64.62
28	633.78	0.53	6.07	0.19	14.80	7.26	30.95	3.75	63.91	66.62	30.46	73.25
31	683.77	0.81	8.54	0.44	23.61	7.08	32.56	3.87	72.93	77.35	33.06	84.12
34	684.32	0.79	10.83	1.12	35.31	4.20	37.29	4.05	81.53	89.41	38.00	97.15
37	572.13	2.62	10.37	1.41	49.93	3.61	39.82	4.24	92.32	105.37	40.57	112.91
40	381.45	3.73	7.54	1.03	63.06	8.02	34.54	3.64	101.10	119.47	35.58	124.66
43	209.71	3.38	3.90	0.49	61.44	8.96	23.36	2.56	91.70	110.59	24.73	113.32
46	-56.32	2.60	3.46	1.14	44.47	10.25	8.28	2.12	62.28	76.63	13.48	77.81

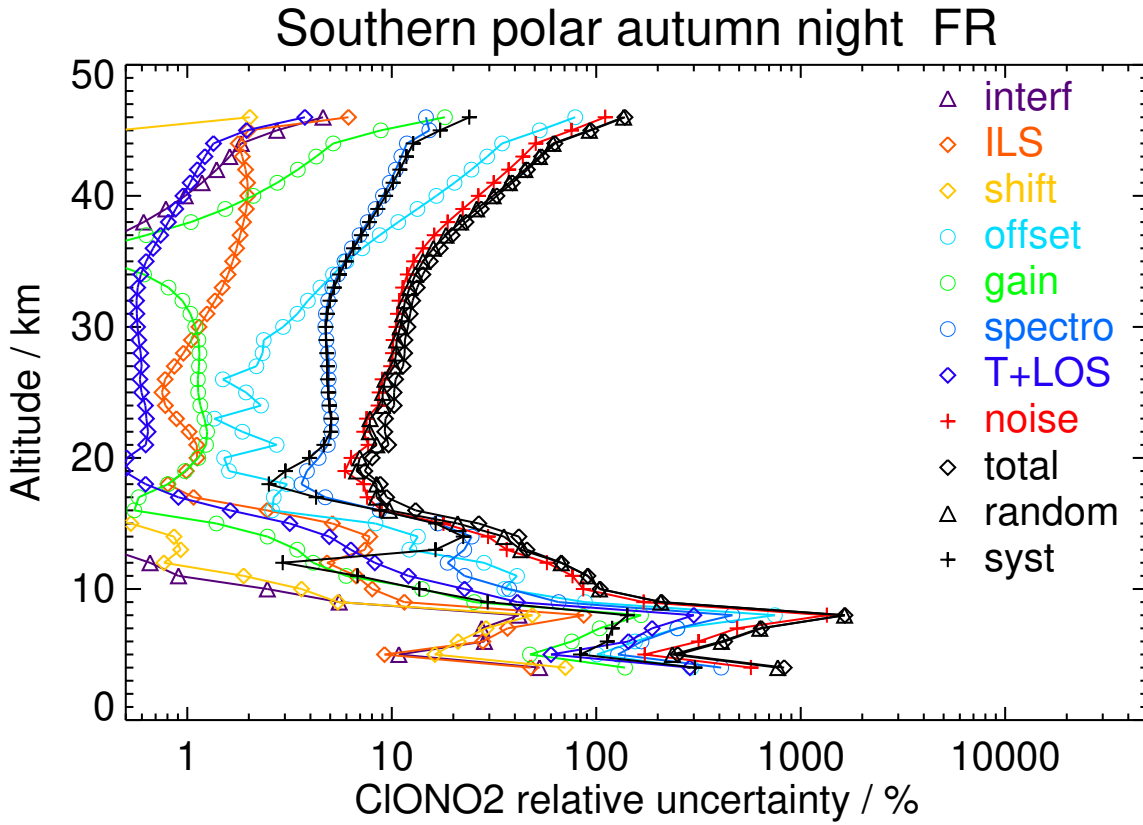


Figure S34: V8H_CLONO2_61 Southern polar autumn night

Table S39: CLONO2 error budget for Northern polar winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-16.58	0.25	3.59	0.53	9.92	2.60	7.92	1.95	39.69	41.95	0.85	41.96
10	96.34	0.10	6.70	0.42	2.06	4.02	16.04	3.29	27.58	30.85	11.93	33.07
13	316.02	0.08	19.63	0.87	3.25	3.54	30.20	5.10	28.08	39.23	24.43	46.21
16	686.75	0.13	20.85	0.97	3.47	9.82	40.22	6.57	32.21	53.64	19.10	56.94
19	814.33	0.10	22.55	1.56	2.71	16.19	57.55	5.75	35.29	61.17	40.35	73.28
22	770.91	0.08	17.84	1.21	2.42	11.66	42.20	3.95	38.61	47.55	38.56	61.22
25	762.45	0.07	15.45	0.95	3.52	9.61	37.44	3.27	47.21	48.65	40.23	63.13
28	679.35	0.20	16.57	0.79	5.02	8.12	36.47	2.95	53.46	54.52	39.89	67.55
31	609.90	0.58	18.12	0.99	10.46	7.55	32.39	2.61	61.46	63.12	36.67	73.00
34	576.18	0.54	17.98	1.06	17.94	5.90	30.30	2.48	73.07	75.59	35.09	83.34
37	514.99	1.99	13.35	0.88	28.06	3.37	33.82	2.79	87.65	92.24	36.13	99.07
40	398.01	3.60	9.17	1.04	38.71	8.40	33.49	3.03	99.29	106.82	35.29	112.50
43	231.29	3.92	5.87	0.94	40.22	8.94	25.48	2.40	90.73	99.47	27.22	103.13
46	73.27	3.18	2.43	0.48	30.03	8.50	14.87	1.51	63.15	70.10	16.99	72.12

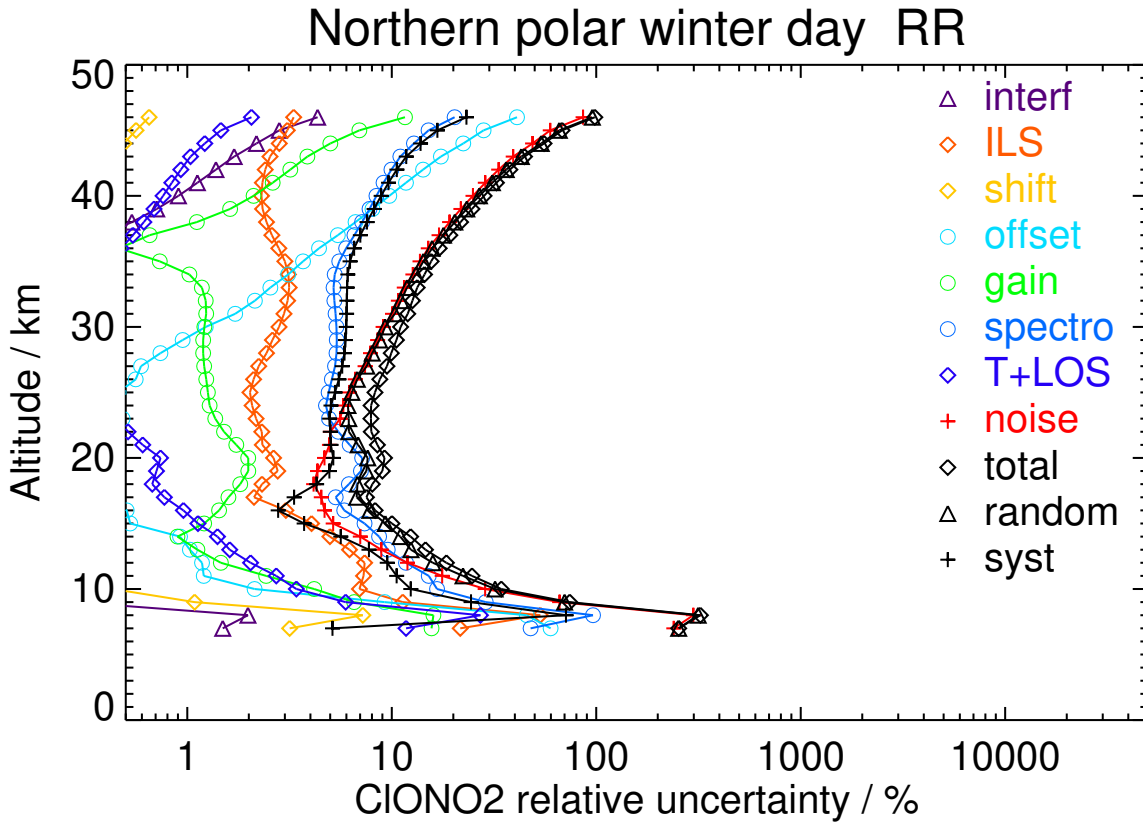


Figure S35: V8R_CLONO2.261 Northern polar winter day

Table S40: CLONO2 error budget for Northern polar winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-18.51	0.27	1.88	0.54	5.03	0.69	4.55	1.04	26.55	27.47	1.41	27.51
10	29.90	0.12	5.83	0.27	1.54	1.50	12.46	2.33	23.31	26.11	7.81	27.25
13	253.34	0.11	11.78	0.52	1.88	3.65	22.02	3.97	26.91	30.14	21.73	37.16
16	469.74	0.10	12.27	0.63	2.11	6.75	25.17	4.24	32.30	41.43	13.39	43.54
19	711.48	0.15	10.30	1.37	3.08	11.51	29.50	4.86	37.86	45.86	21.77	50.76
22	1151.93	0.15	19.18	1.62	3.35	14.10	48.02	5.37	40.80	51.77	43.59	67.68
25	1045.23	0.16	31.73	1.10	4.18	11.67	60.29	6.93	50.92	57.01	64.71	86.24
28	805.54	0.26	33.58	1.66	5.48	9.00	45.61	5.26	52.90	56.34	54.53	78.41
31	630.70	0.75	31.46	2.11	11.23	9.32	31.49	3.30	60.68	62.90	43.99	76.76
34	568.30	1.03	28.04	1.79	16.33	7.78	26.92	2.54	71.28	73.84	38.45	83.25
37	459.14	2.47	12.85	0.90	20.37	11.00	29.91	2.89	77.68	81.37	32.00	87.44
40	330.53	3.97	5.56	1.61	28.83	24.34	30.17	3.43	83.64	89.99	35.96	96.91
43	220.55	4.96	3.71	1.48	36.01	27.26	25.79	3.30	85.56	94.12	34.90	100.38
46	114.54	4.04	2.19	0.81	29.70	20.01	17.29	2.30	64.93	72.31	24.42	76.32

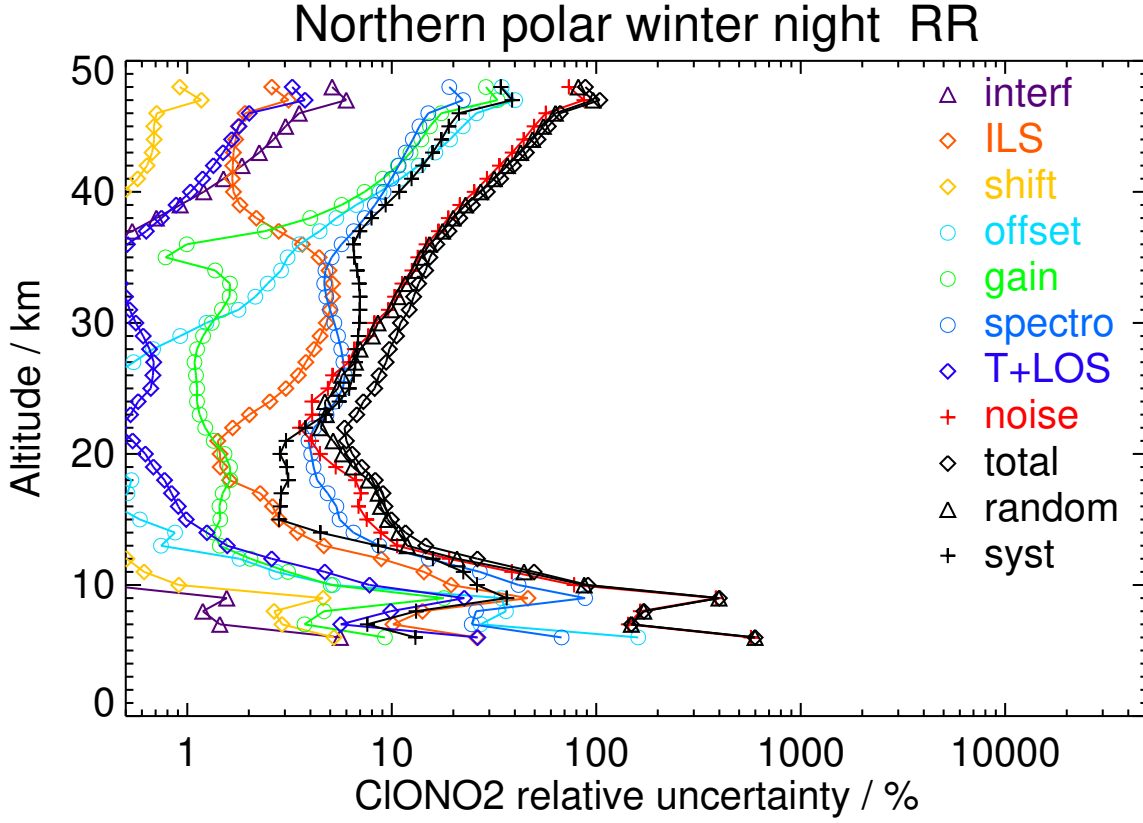


Figure S36: V8R_CLONO2_261 Northern polar winter night

Table S41: CLONO2 error budget for Northern polar spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	11.35	0.29	3.50	0.34	11.98	2.26	8.88	3.31	50.22	52.63	1.87	52.66
10	63.38	0.09	2.94	0.19	2.17	1.85	5.07	1.52	28.15	28.81	2.70	28.94
13	127.62	0.08	7.47	0.73	2.62	1.56	18.25	2.93	29.35	32.29	15.04	35.62
16	454.16	0.12	7.72	0.51	2.49	2.26	24.11	4.63	34.38	36.77	22.45	43.08
19	793.80	0.12	9.21	1.46	2.45	7.63	25.90	3.38	39.98	43.00	24.15	49.31
22	906.80	0.12	12.68	0.71	3.17	10.24	43.15	4.22	44.73	46.27	44.89	64.47
25	818.31	0.18	14.70	0.67	4.31	10.20	48.34	4.55	53.09	53.98	51.01	74.27
28	671.23	0.53	18.25	1.04	7.35	9.52	44.26	4.43	60.10	61.07	48.38	77.91
31	468.80	0.99	20.09	1.63	14.33	8.13	34.05	4.13	69.20	71.28	39.54	81.51
34	257.93	0.86	18.52	1.14	20.70	3.50	23.86	2.97	79.60	82.58	29.66	87.75
37	111.36	3.11	13.78	0.76	26.40	7.78	23.92	2.60	89.40	93.51	28.03	97.62
40	32.60	4.97	9.98	1.50	35.15	17.86	29.21	3.46	95.17	101.89	34.96	107.72
43	-8.32	4.92	7.13	1.47	41.05	20.43	29.78	3.40	90.80	100.10	36.08	106.40
46	-18.07	3.40	3.96	0.87	34.13	14.63	20.42	2.29	67.76	76.17	24.87	80.13

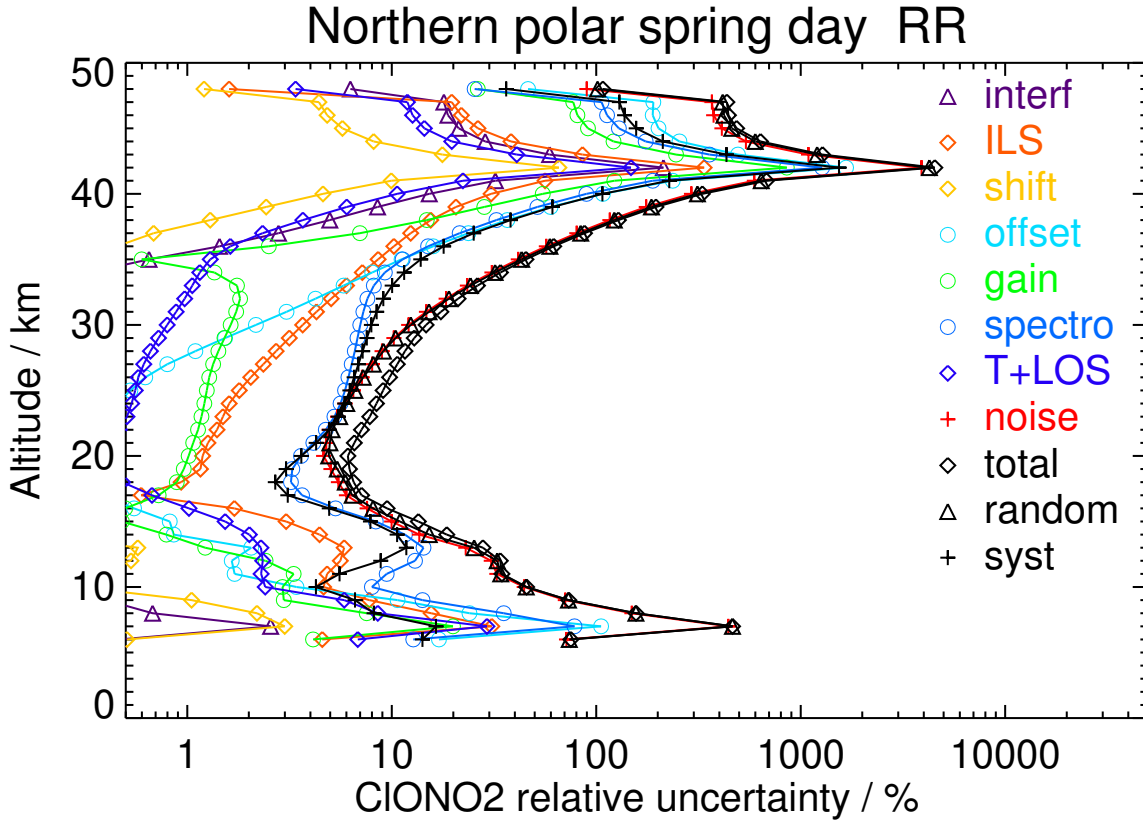


Figure S37: V8R.CLONO2.261 Northern polar spring day

Table S42: CLONO2 error budget for Northern polar spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-29.05	0.34	4.32	0.64	13.34	4.03	11.04	3.63	49.75	52.45	8.54	53.14
10	50.76	0.11	3.39	0.39	3.40	1.47	7.10	1.97	26.08	27.36	3.40	27.57
13	121.61	0.09	6.91	0.76	2.03	1.64	15.21	2.37	26.89	30.19	10.17	31.86
16	366.04	0.13	10.42	0.86	2.37	2.89	27.93	4.75	31.82	36.38	24.80	44.03
19	769.75	0.13	7.82	1.56	2.76	7.66	26.86	3.72	37.91	43.24	20.78	47.98
22	990.50	0.16	13.40	0.71	3.12	11.00	42.96	4.07	42.61	45.62	43.68	63.16
25	965.84	0.29	16.49	0.75	4.56	11.90	52.15	4.87	53.32	54.51	55.23	77.60
28	869.88	0.63	21.14	1.20	7.55	11.11	50.38	4.96	59.35	60.41	55.37	81.94
31	738.64	1.12	24.20	1.88	14.50	10.28	43.74	5.07	68.94	70.94	50.65	87.17
34	519.59	0.95	22.97	1.44	20.88	5.73	36.09	4.26	78.86	81.92	42.76	92.41
37	291.62	3.05	17.12	0.78	26.53	6.79	35.25	3.41	88.56	92.72	39.41	100.74
40	113.79	5.11	11.61	1.49	35.56	17.71	36.73	3.73	94.91	101.74	41.96	110.05
43	6.44	5.12	7.23	1.50	41.43	20.92	32.59	3.49	90.93	100.34	38.85	107.60
46	-19.09	3.48	3.51	0.90	34.01	15.21	20.77	2.33	67.29	75.66	25.56	79.86

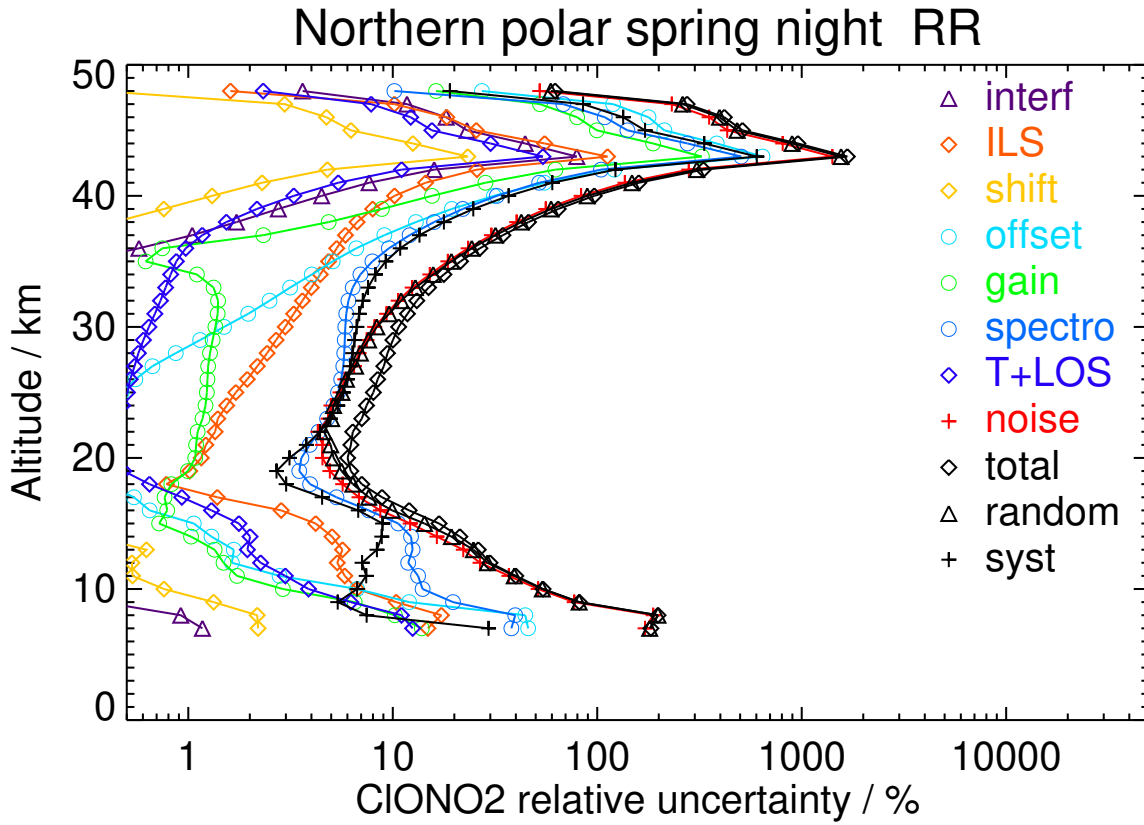


Figure S38: V8R_CLONO2_261 Northern polar spring night

Table S43: CLONO2 error budget for Northern polar summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
10	13.38	0.26	2.53	0.49	2.92	0.71	4.54	1.30	25.15	25.88	1.03	25.90
13	12.28	0.14	2.70	0.64	1.20	0.67	3.12	0.93	23.25	23.60	1.95	23.68
16	21.32	0.12	3.53	0.37	2.12	0.68	6.48	1.50	28.14	28.69	5.51	29.22
19	192.23	0.09	1.06	0.46	1.36	0.70	14.77	2.40	33.89	34.27	14.20	37.10
22	410.40	0.12	6.01	0.73	2.24	4.30	12.08	1.35	35.61	36.24	12.74	38.42
25	494.94	0.15	9.18	0.49	3.97	6.82	19.64	1.76	47.66	48.12	22.18	52.99
28	527.10	0.26	16.79	0.48	4.44	7.33	23.38	2.02	50.06	50.79	28.87	58.42
31	494.10	0.72	25.47	1.46	10.51	8.74	22.92	2.37	59.68	61.04	34.71	70.22
34	325.14	1.03	24.84	1.75	15.31	7.30	18.99	2.13	69.87	71.78	31.68	78.46
37	150.44	2.98	11.64	0.69	15.18	9.05	23.73	2.68	73.34	75.13	27.58	80.04
40	37.23	4.07	5.48	2.29	18.58	24.33	27.98	3.69	74.01	76.76	37.03	85.22
43	-3.85	4.77	4.33	2.48	28.27	30.89	30.58	3.78	76.70	82.27	43.19	92.92
46	-16.64	4.70	2.62	1.54	29.13	24.35	24.07	2.69	66.37	72.87	33.97	80.40
49	-0.93	3.22	1.27	0.76	22.80	15.21	14.79	1.62	46.46	51.97	21.02	56.06

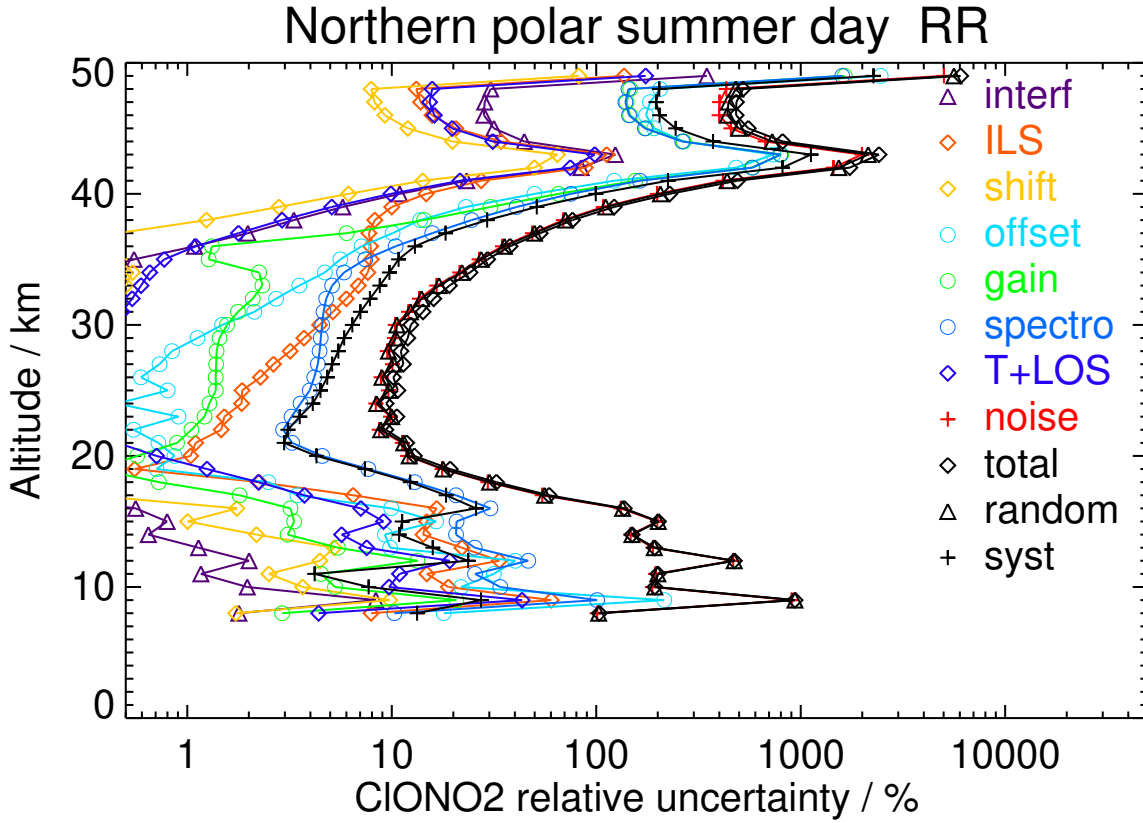


Figure S39: V8R_CLONO2_261 Northern polar summer day

Table S44: CIONO2 error budget for Northern polar summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
13	12.16	0.11	2.49	0.51	6.55	0.86	4.77	1.07	38.91	39.83	1.27	39.85
16	41.78	0.10	3.18	0.16	2.01	0.95	7.82	2.29	29.70	30.10	7.61	31.05
19	235.97	0.11	1.01	0.67	1.67	0.61	14.97	2.99	34.40	34.93	14.19	37.70
22	480.87	0.16	5.66	0.54	2.05	3.88	15.34	1.67	38.58	39.94	13.54	42.17
25	640.97	0.23	8.66	0.72	3.36	7.24	22.15	2.12	49.15	50.18	23.06	55.23
28	774.95	0.40	17.49	0.58	5.04	9.68	31.55	2.61	53.52	55.41	34.95	65.52
31	762.64	0.92	27.55	1.48	10.79	11.42	33.48	3.42	61.66	63.59	43.57	77.09
34	621.94	1.12	27.69	2.01	16.02	8.83	32.00	3.43	72.79	74.96	42.68	86.26
37	394.72	3.21	15.59	0.72	17.97	6.93	38.14	3.78	78.79	81.09	41.53	91.11
40	199.40	4.61	7.31	1.08	23.72	19.40	42.03	4.05	80.36	84.17	46.59	96.20
43	57.61	5.13	4.20	1.38	33.00	22.63	36.07	3.32	81.75	88.56	42.41	98.19
46	7.33	4.15	1.87	0.86	30.99	16.68	21.49	2.09	67.42	74.48	26.93	79.20

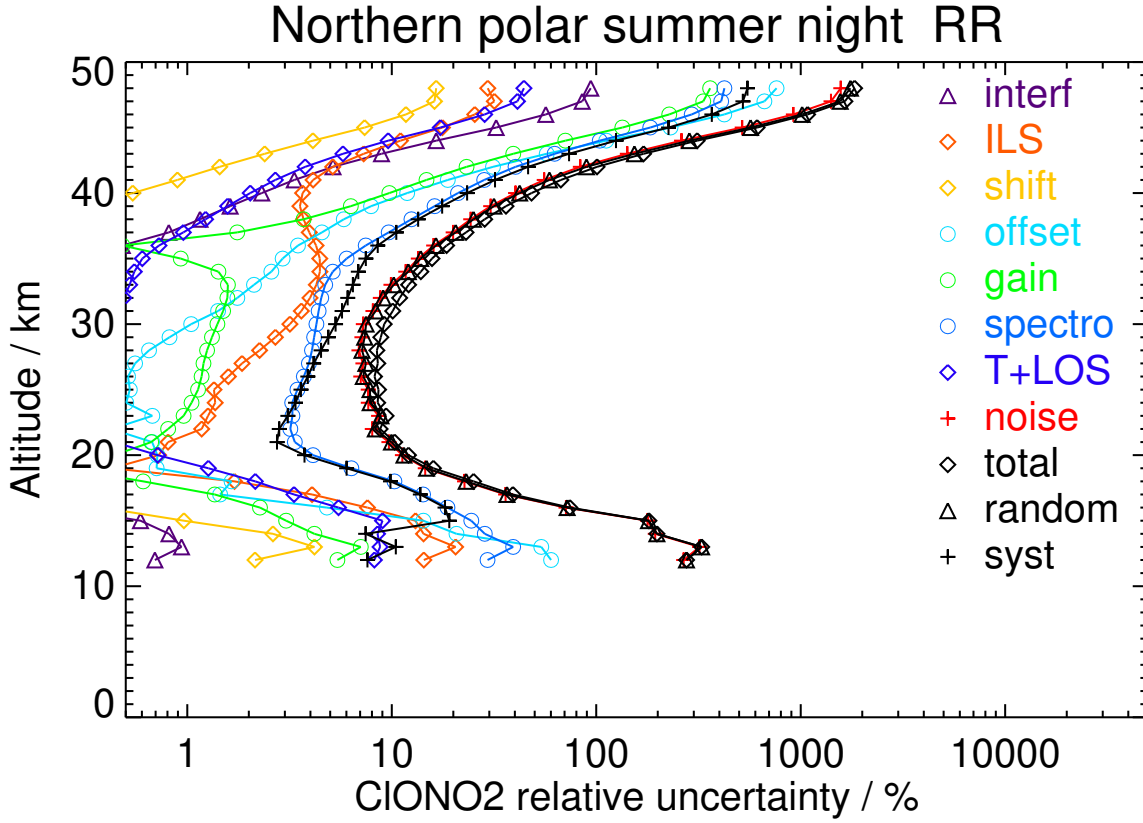


Figure S40: V8R_CLONO2.261 Northern polar summer night

Table S45: CLONO2 error budget for Northern polar autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
13	39.29	0.09	4.48	0.52	3.62	0.58	8.00	2.00	25.59	26.61	6.94	27.50
16	192.17	0.07	5.60	0.38	1.84	0.96	16.35	3.77	30.12	31.32	15.61	35.00
19	442.69	0.10	4.70	1.19	2.45	3.35	14.93	2.35	36.75	38.39	12.10	40.25
22	608.64	0.08	8.57	0.53	2.55	6.00	21.59	2.09	42.03	42.73	22.96	48.51
25	675.38	0.14	10.53	0.69	3.90	7.49	29.29	2.69	52.25	52.90	31.29	61.46
28	709.63	0.44	14.29	0.92	6.82	8.11	34.05	2.91	59.01	60.11	36.81	70.48
31	715.22	0.85	18.56	1.20	13.65	8.30	37.11	3.48	68.08	69.96	41.60	81.40
34	605.85	0.65	19.90	1.20	21.41	5.82	37.13	3.65	79.47	82.62	42.09	92.73
37	420.96	2.89	15.02	0.80	29.70	4.16	35.49	3.27	92.74	97.61	38.45	104.91
40	238.04	4.52	8.95	0.84	38.88	11.82	29.23	2.90	100.89	108.52	31.92	113.11
43	98.83	4.62	4.17	0.74	41.29	14.08	19.84	2.50	92.61	101.86	23.32	104.49
46	-7.32	3.76	0.81	0.50	31.44	13.60	12.16	2.21	65.32	72.82	17.46	74.89

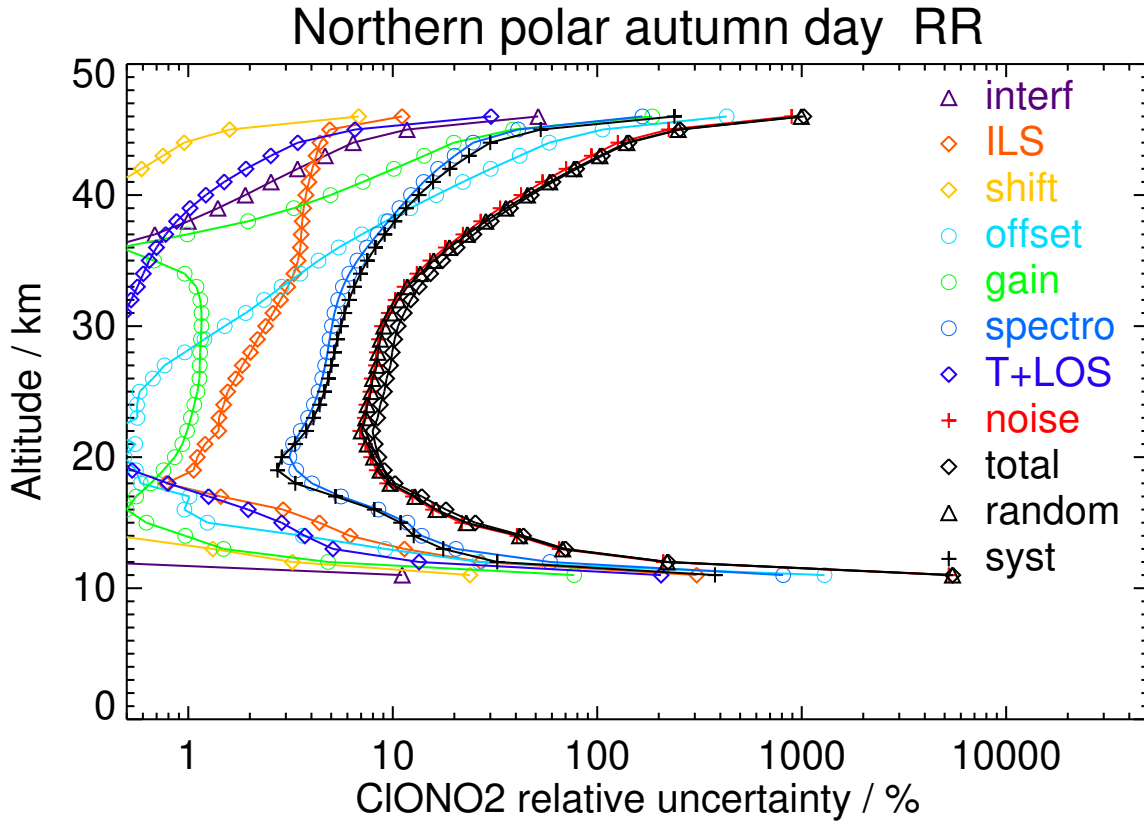


Figure S41: V8R_CLONO2_261 Northern polar autumn day

Table S46: CLONO2 error budget for Northern polar autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
13	57.55	0.09	5.08	0.55	3.65	1.29	8.99	2.24	25.76	27.07	7.60	28.11
16	243.86	0.07	6.81	0.51	2.04	1.30	18.91	4.30	30.28	31.45	18.87	36.68
19	514.34	0.10	5.73	1.18	2.35	4.56	15.03	2.09	36.69	37.70	14.68	40.46
22	643.12	0.11	9.45	0.54	2.68	7.02	25.77	2.55	41.60	42.92	26.56	50.47
25	739.25	0.24	10.83	0.82	4.04	8.27	31.69	3.00	52.10	52.97	33.53	62.69
28	776.89	0.54	16.56	0.78	6.92	8.97	36.34	3.33	58.76	60.32	39.37	72.03
31	783.52	0.95	22.22	1.63	13.72	9.36	39.25	3.89	67.57	69.82	44.94	83.03
34	663.06	0.74	22.39	1.40	21.08	6.75	39.12	3.95	78.78	82.07	44.85	93.52
37	478.62	2.98	16.47	0.80	28.94	4.22	37.94	3.57	91.54	96.35	41.06	104.73
40	290.41	4.64	10.15	0.99	37.95	12.46	32.37	3.25	99.63	107.08	35.20	112.72
43	133.36	4.71	4.97	0.94	40.96	15.49	22.98	2.80	92.07	101.40	26.39	104.78
46	32.06	3.56	1.36	0.63	31.88	13.73	13.66	2.27	65.72	73.63	17.58	75.70

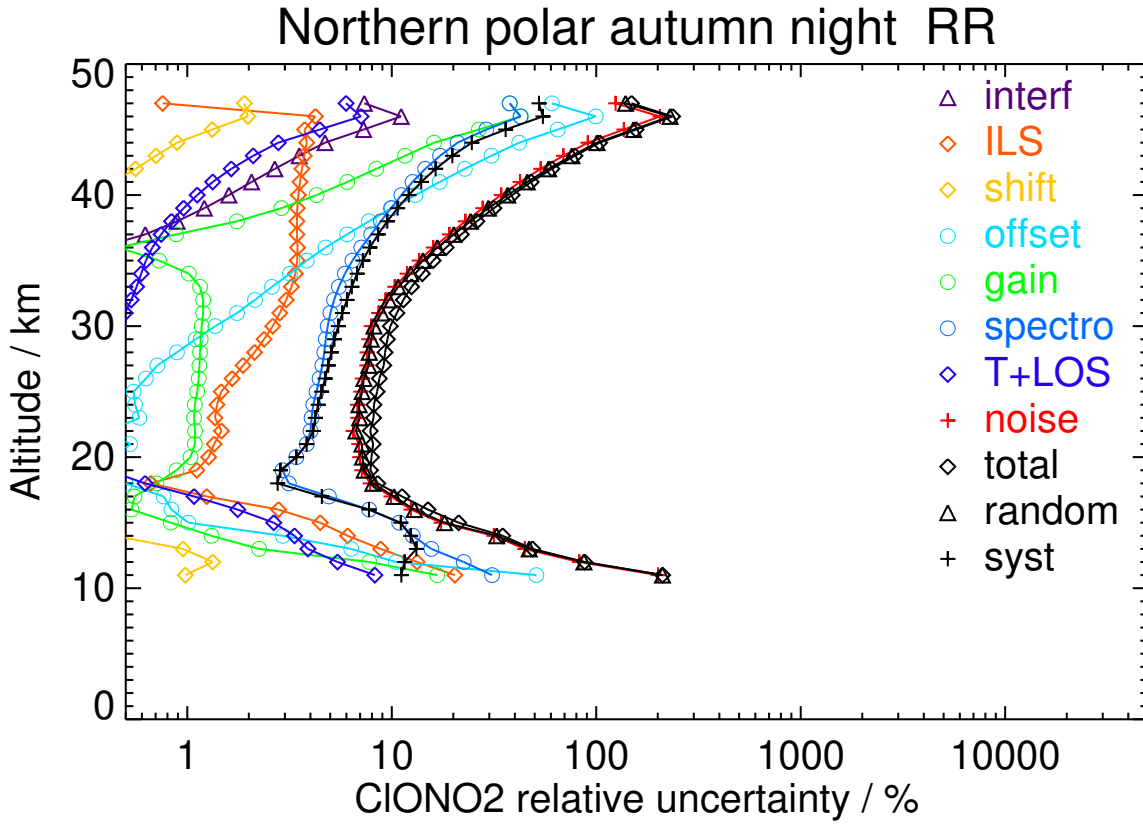


Figure S42: V8R.CLONO2.261 Northern polar autumn night

Table S47: CIONO2 error budget for Northern midlatitude winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-4.80	0.36	2.14	0.51	8.19	0.80	4.99	1.68	36.92	38.25	0.51	38.26
10	17.03	0.14	2.69	0.28	3.17	0.98	6.07	1.66	26.89	27.74	3.39	27.95
13	108.98	0.09	7.43	0.61	3.68	0.81	11.94	2.02	26.32	28.90	8.60	30.15
16	211.04	0.08	6.51	0.45	2.49	3.94	17.67	2.42	30.72	35.79	6.73	36.41
19	399.29	0.09	6.52	1.16	2.14	4.41	19.72	2.82	35.14	39.65	11.29	41.22
22	582.16	0.09	8.34	0.65	2.85	6.62	19.68	2.19	40.10	41.58	19.81	46.06
25	718.73	0.12	12.68	0.98	3.93	7.38	30.10	2.83	48.66	49.79	32.16	59.28
28	664.13	0.28	21.47	0.85	5.38	7.74	35.77	3.43	53.65	54.33	42.04	68.70
31	508.99	0.81	25.89	1.75	11.23	9.05	30.17	3.22	59.79	61.34	40.19	73.34
34	371.75	1.10	20.57	1.45	15.35	4.61	26.10	2.57	68.23	70.18	33.19	77.63
37	257.01	2.20	11.84	0.93	20.26	10.02	29.52	2.61	77.47	80.59	32.30	86.82
40	150.05	3.95	6.23	1.30	31.60	19.75	28.60	3.02	86.56	92.71	34.19	98.82
43	68.78	5.06	3.18	1.18	38.69	22.30	23.90	3.13	87.21	95.96	31.75	101.08
46	2.51	4.26	1.19	0.64	32.55	16.59	15.81	2.32	66.41	74.33	22.26	77.59

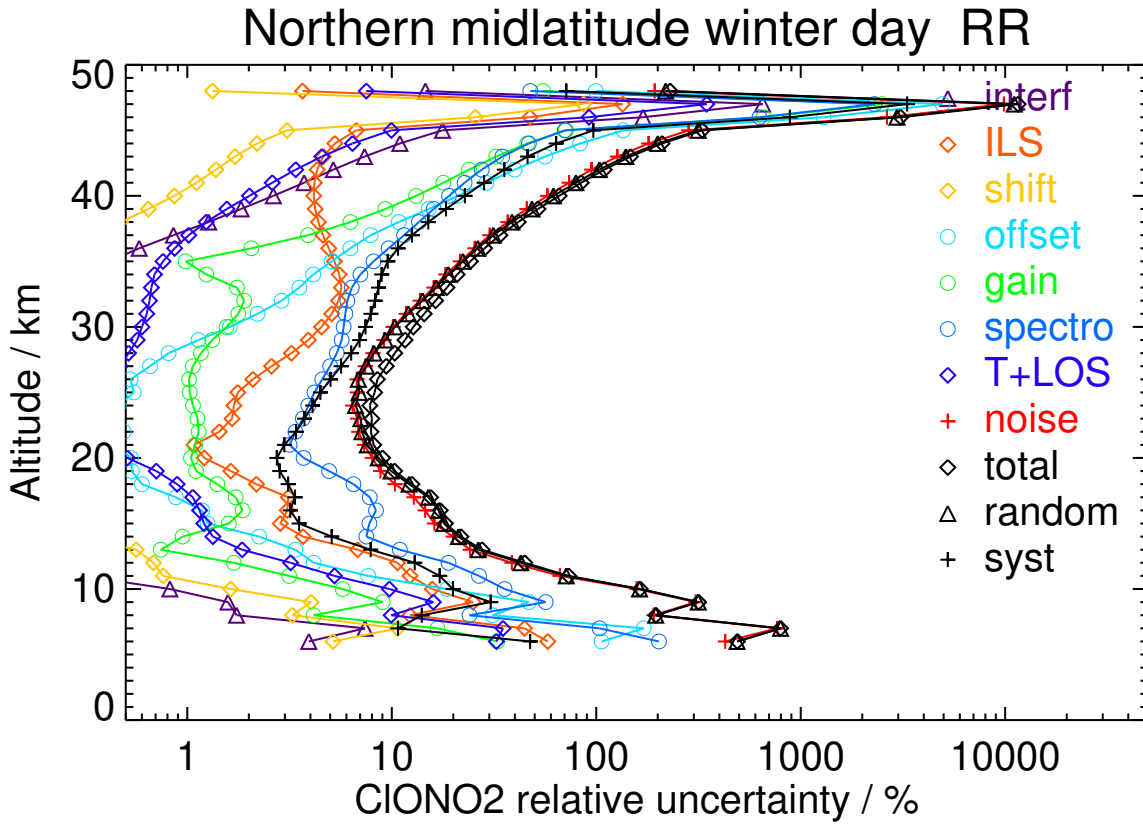


Figure S43: V8R_CLONO2.261 Northern midlatitude winter day

Table S48: CIONO2 error budget for Northern midlatitude winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-14.89	0.38	1.79	0.56	8.80	0.79	4.86	1.80	34.66	36.19	0.56	36.19
10	9.82	0.13	3.02	0.30	2.08	1.02	6.32	1.76	24.62	25.44	4.03	25.76
13	96.60	0.09	5.93	0.57	2.26	0.98	11.32	1.62	25.39	28.17	4.82	28.58
16	169.48	0.08	9.70	0.62	2.49	2.37	26.03	2.87	30.29	39.64	11.78	41.35
19	482.29	0.11	7.60	1.30	2.14	5.90	28.83	3.61	35.31	44.51	14.47	46.80
22	716.36	0.12	9.14	0.66	3.04	8.49	25.13	2.89	40.48	43.30	23.86	49.44
25	868.18	0.20	13.34	1.00	4.15	8.61	35.83	3.51	49.96	51.17	38.01	63.74
28	833.82	0.38	24.75	0.85	5.83	9.53	42.24	4.24	54.19	55.18	49.32	74.01
31	670.59	0.90	31.40	2.29	12.04	11.55	35.71	4.08	60.08	61.80	48.51	78.57
34	532.58	1.26	24.83	1.92	15.38	6.23	32.06	3.27	68.24	70.34	40.54	81.19
37	380.48	2.49	12.64	0.91	18.26	11.41	36.42	3.28	75.85	78.55	39.40	87.87
40	202.06	3.89	4.88	1.45	28.83	23.69	34.35	3.49	82.51	87.89	41.35	97.13
43	70.94	5.31	2.03	1.37	37.24	27.45	28.02	3.56	84.90	93.28	38.44	100.89
46	16.52	4.73	1.53	0.71	32.48	20.23	18.52	2.65	66.94	74.81	26.91	79.50

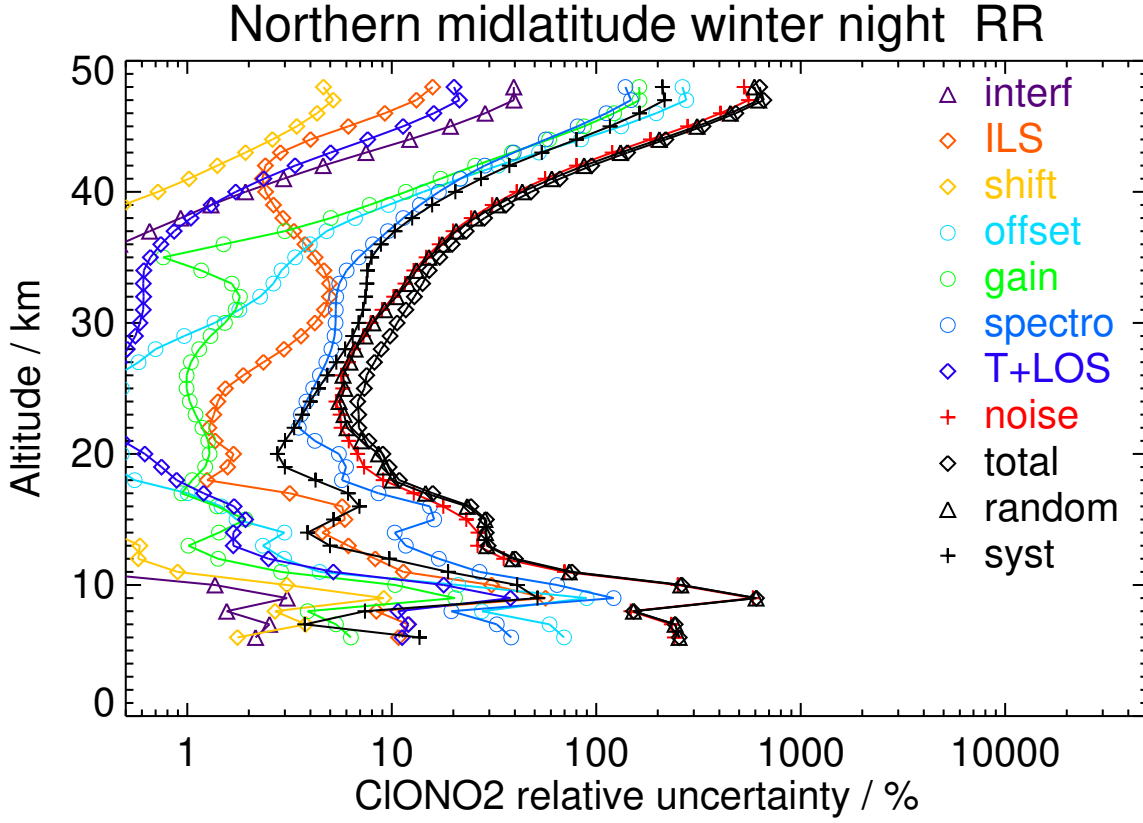


Figure S44: V8R_CLONO2_261 Northern midlatitude winter night

Table S49: CIONO2 error budget for Northern midlatitude spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-6.43	0.39	1.62	0.40	11.70	0.62	4.91	2.45	50.01	51.64	1.99	51.68
10	10.97	0.12	2.49	0.29	3.42	1.19	4.81	1.66	26.90	27.59	2.75	27.73
13	44.58	0.09	4.16	0.63	2.30	1.02	7.60	1.39	26.14	27.51	3.27	27.70
16	137.43	0.10	6.71	0.36	2.34	1.60	18.11	2.87	30.57	34.29	12.20	36.39
19	407.77	0.10	5.28	1.08	2.29	4.58	23.68	3.54	36.39	40.88	16.79	44.19
22	721.46	0.11	7.97	0.64	3.04	7.17	25.93	2.97	42.56	46.15	22.07	51.15
25	836.74	0.15	13.58	0.88	3.84	8.70	37.99	3.56	48.92	50.15	40.12	64.23
28	773.69	0.33	23.37	0.84	6.16	9.29	43.91	4.26	56.83	57.85	50.01	76.47
31	567.58	0.83	29.18	2.15	11.75	9.46	38.23	4.34	61.53	63.28	48.44	79.69
34	316.28	1.08	25.20	1.86	16.63	5.67	28.20	3.32	71.10	73.52	37.47	82.52
37	143.65	2.47	14.24	1.05	20.19	9.24	23.98	2.41	79.36	82.34	28.33	87.07
40	52.86	3.88	5.55	1.75	29.19	22.67	24.08	3.57	85.30	90.63	32.71	96.35
43	4.63	4.96	1.92	1.68	37.25	27.65	23.39	4.03	85.81	94.07	35.52	100.55
46	-15.70	4.62	1.73	0.91	32.56	21.17	17.00	3.06	67.32	75.19	26.66	79.77

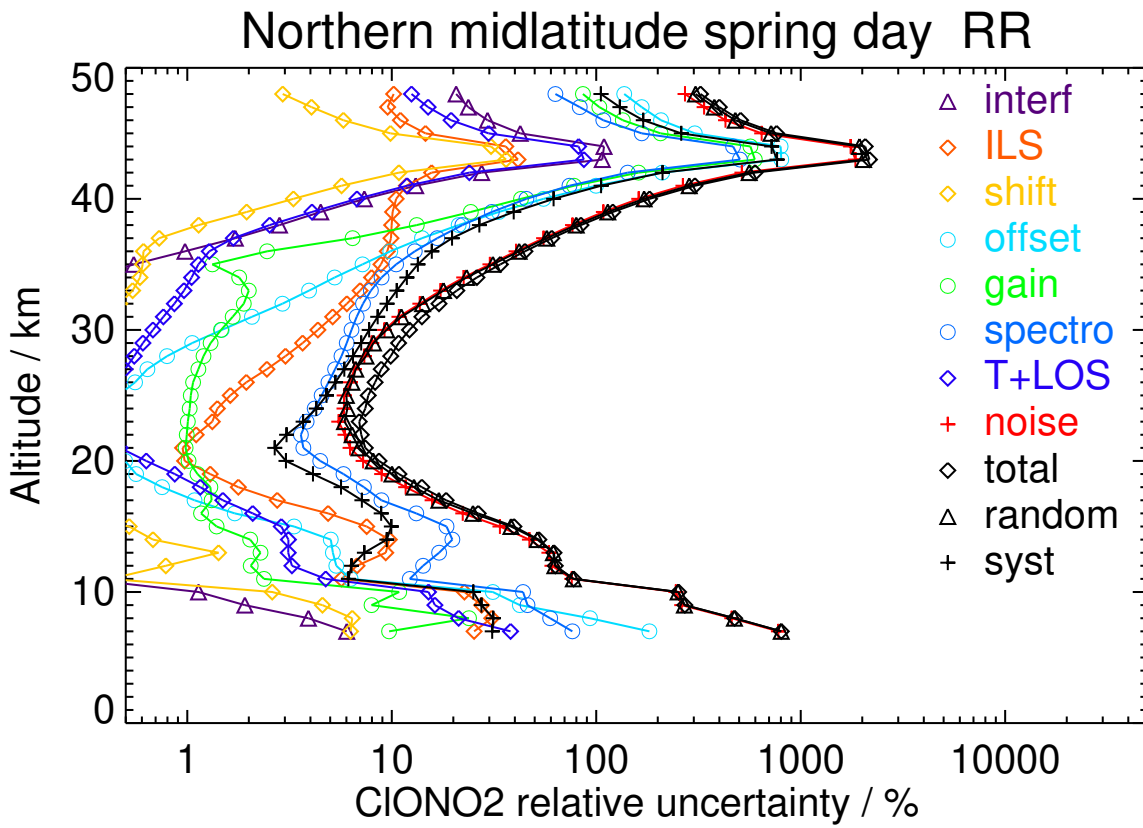


Figure S45: V8R_CLONO2.261 Northern midlatitude spring day

Table S50: CIONO2 error budget for Northern midlatitude spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	15.98	0.46	1.75	0.35	13.21	1.23	5.86	4.24	50.68	52.77	3.98	52.92
10	27.00	0.12	2.77	0.32	3.57	0.73	4.65	1.61	26.48	27.19	2.65	27.32
13	35.57	0.10	4.99	0.68	2.05	1.04	9.79	1.61	26.32	28.36	4.17	28.67
16	198.42	0.12	7.39	0.48	2.34	2.09	19.58	3.37	31.03	34.06	16.21	37.72
19	472.32	0.12	4.74	1.18	2.20	4.31	21.98	3.23	36.61	40.41	15.76	43.37
22	811.04	0.17	6.98	0.74	3.11	7.60	25.62	3.00	42.24	44.85	23.56	50.66
25	987.70	0.24	13.35	1.06	4.03	10.33	39.49	3.74	49.43	50.63	41.90	65.72
28	1025.42	0.45	25.22	0.83	6.32	12.14	48.18	4.60	56.48	57.51	55.22	79.73
31	899.39	0.97	34.79	2.50	12.40	13.53	47.68	5.24	61.86	63.97	59.91	87.64
34	653.59	1.13	30.08	2.33	16.24	8.29	42.42	4.74	70.36	72.80	52.12	89.53
37	378.02	2.64	17.00	0.95	19.57	9.70	39.87	3.71	78.34	81.34	43.56	92.27
40	186.59	4.05	7.74	1.51	29.03	23.20	36.05	3.78	84.49	89.96	42.66	99.56
43	77.24	4.90	3.07	1.64	37.19	28.42	30.18	3.99	85.52	93.88	40.65	102.31
46	25.30	4.27	1.54	0.95	32.55	21.62	19.80	3.00	67.23	75.14	28.72	80.44

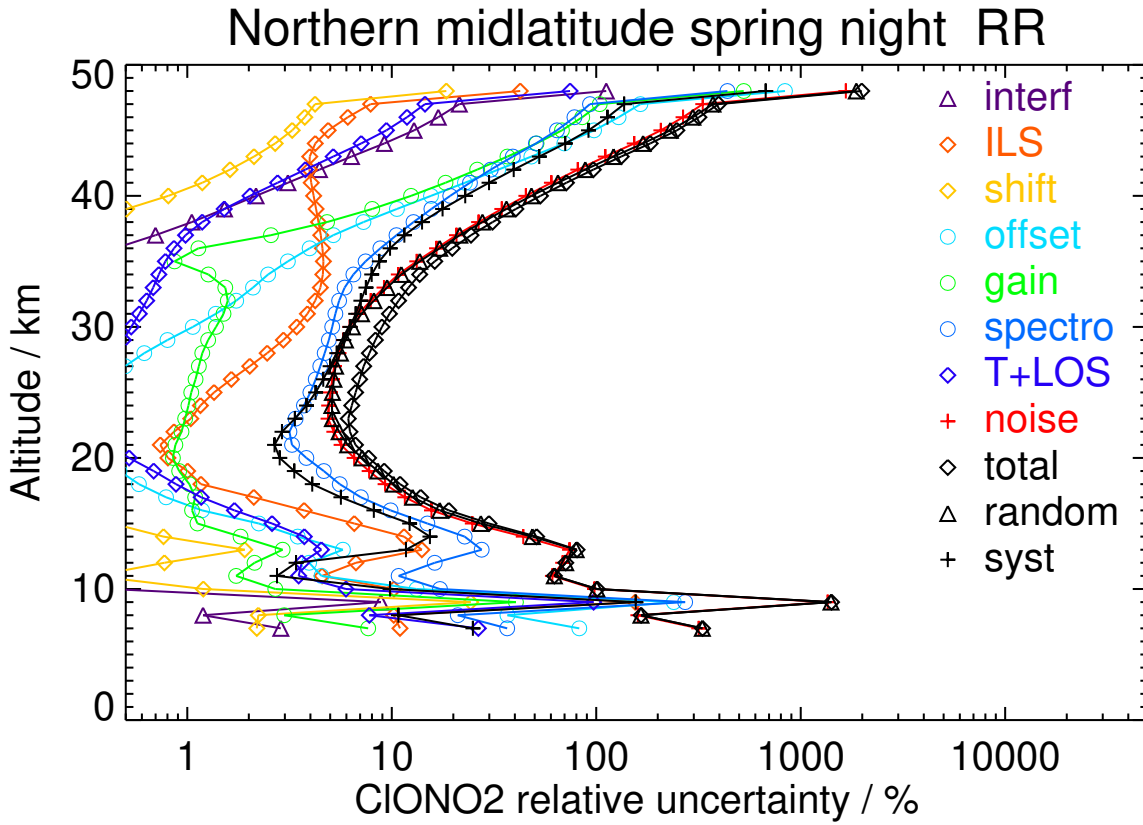


Figure S46: V8R_CLONO2_261 Northern midlatitude spring night

Table S51: CIONO2 error budget for Northern midlatitude summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
10	-22.08	0.37	2.59	0.58	5.30	2.03	3.23	2.34	28.29	29.09	3.06	29.25
13	-13.53	0.14	0.97	0.46	3.46	0.71	2.86	1.04	26.88	27.28	1.32	27.31
16	-11.73	0.11	0.89	0.15	2.74	0.44	2.32	1.27	29.93	30.18	0.43	30.19
19	52.23	0.08	3.02	0.36	1.38	0.78	15.32	2.64	34.08	34.42	15.17	37.61
22	443.52	0.12	2.53	0.97	3.03	2.44	23.76	3.67	39.19	39.82	23.47	46.22
25	836.32	0.16	9.03	0.97	3.83	7.40	25.14	2.64	49.27	49.76	27.24	56.73
28	876.00	0.27	26.07	0.80	5.07	9.37	45.56	4.26	53.29	53.96	53.07	75.68
31	614.21	0.70	34.93	2.35	10.33	11.02	42.64	4.71	59.05	60.38	55.99	82.35
34	331.77	1.09	26.21	1.99	14.18	6.68	31.66	3.56	67.82	69.62	41.30	80.95
37	130.74	2.15	12.93	0.92	16.23	9.33	27.94	2.51	75.12	77.46	30.88	83.38
40	47.09	3.05	3.54	1.91	24.59	23.39	25.25	3.46	80.00	84.17	33.79	90.70
43	27.23	4.62	1.86	2.13	33.57	30.58	23.58	4.39	82.31	89.51	37.82	97.17
46	12.07	4.87	2.74	1.24	31.01	24.53	18.30	3.49	67.39	74.75	29.95	80.53

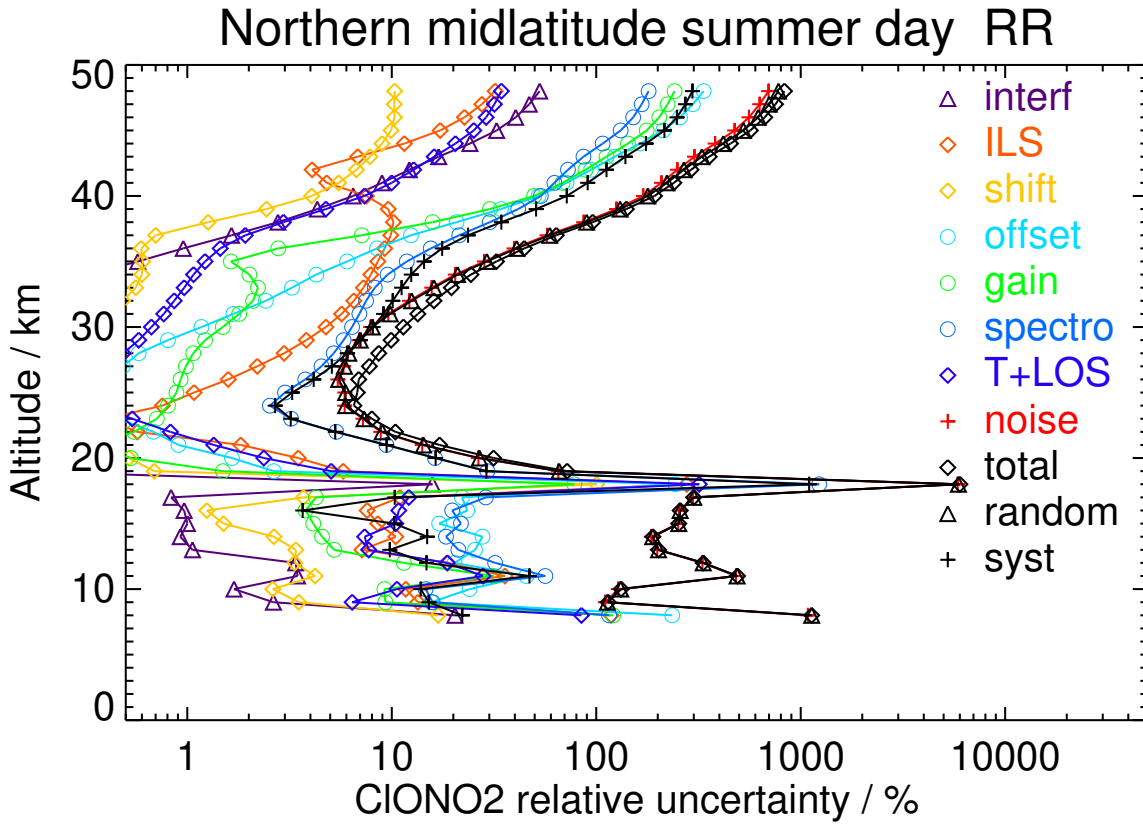


Figure S47: V8R_CLONO2.261 Northern midlatitude summer day

Table S52: CIONO2 error budget for Northern midlatitude summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
10	-9.47	0.63	2.57	0.63	5.25	1.22	4.41	1.63	28.95	29.70	3.79	29.94
13	-9.99	0.24	1.20	0.43	1.45	0.52	2.97	1.03	25.21	25.43	1.59	25.48
16	-9.97	0.17	1.32	0.19	1.82	0.32	2.72	1.37	30.30	30.50	1.57	30.54
19	82.50	0.13	3.13	0.43	1.54	0.77	15.59	2.92	35.64	36.04	15.36	39.18
22	474.23	0.19	3.25	0.86	2.93	3.60	28.25	4.27	41.20	42.06	27.88	50.47
25	985.67	0.24	8.59	1.02	3.64	8.86	26.38	2.99	49.72	50.31	28.52	57.83
28	1110.91	0.39	26.42	0.73	5.30	11.95	49.38	4.50	54.90	55.62	57.00	79.64
31	937.35	0.84	39.16	2.41	10.67	14.47	50.42	5.35	60.21	61.69	65.22	89.77
34	706.59	1.07	32.53	2.61	14.49	9.96	43.96	4.76	68.88	70.85	55.28	89.87
37	452.08	2.40	17.13	0.89	16.27	9.02	42.22	3.89	76.17	78.56	45.55	90.81
40	241.39	3.52	5.72	1.44	24.00	24.09	37.08	3.86	80.17	84.18	43.97	94.98
43	103.78	4.51	1.46	1.92	32.99	31.80	28.69	4.43	81.93	88.93	42.12	98.40
46	37.63	4.65	2.69	1.24	30.85	25.86	18.87	3.73	67.50	74.74	31.47	81.10

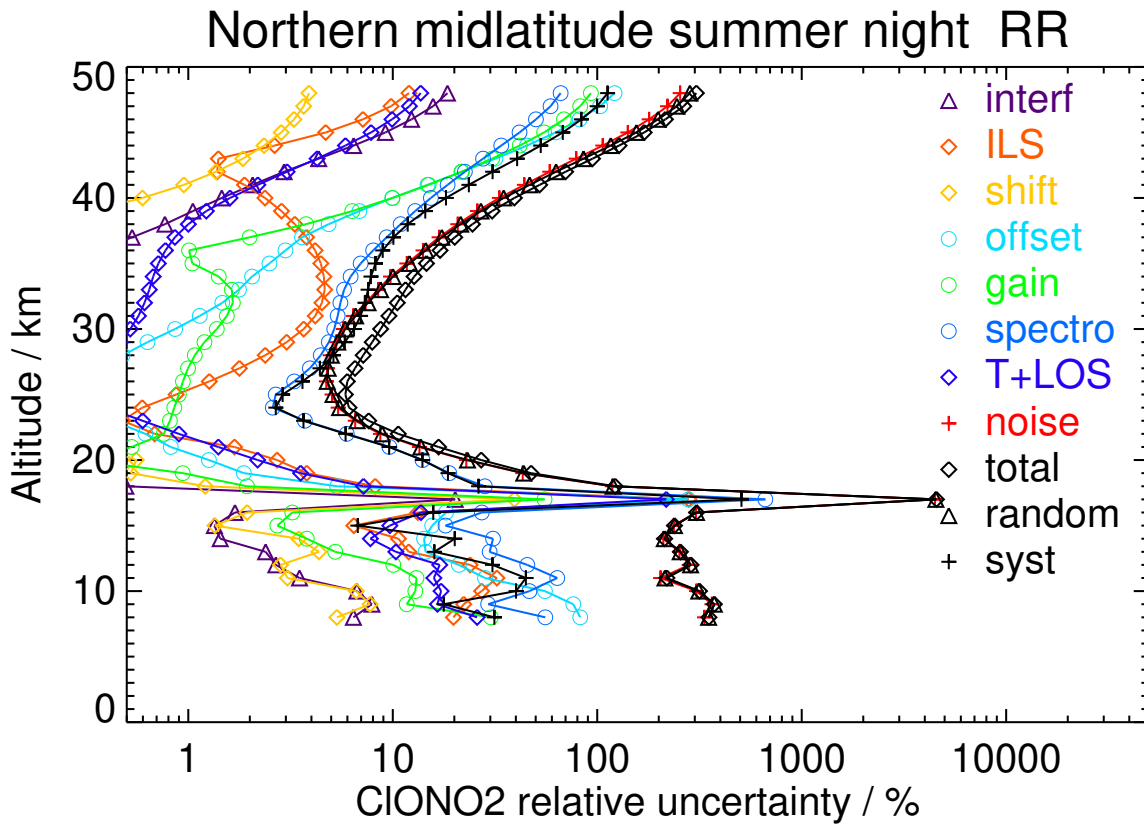


Figure S48: V8R_CLONO2_261 Northern midlatitude summer night

Table S53: CLONO2 error budget for Northern midlatitude autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
10	-7.76	0.38	2.12	0.47	5.69	1.20	3.59	1.93	29.40	30.18	2.94	30.33
13	-7.60	0.13	1.47	0.52	3.23	0.61	2.62	0.90	27.47	27.82	1.22	27.85
16	-1.57	0.09	1.49	0.23	3.41	0.42	4.01	1.26	30.14	30.65	0.97	30.66
19	93.94	0.07	3.36	0.49	1.72	1.10	17.13	2.71	34.22	35.34	15.46	38.57
22	421.88	0.09	2.51	0.78	2.90	3.09	20.94	3.04	39.46	40.59	19.55	45.06
25	783.39	0.15	8.78	0.98	4.21	7.02	24.16	2.59	50.68	51.70	25.12	57.48
28	834.96	0.34	21.09	0.86	5.90	8.93	43.44	3.81	54.56	55.37	48.71	73.74
31	598.39	0.83	27.56	2.14	11.90	10.32	42.52	4.57	61.84	63.45	51.38	81.64
34	336.97	0.92	21.09	1.58	15.07	4.61	33.60	3.48	69.79	71.70	39.59	81.90
37	177.47	2.33	10.42	0.69	20.53	10.92	29.82	2.67	79.35	82.22	32.98	88.59
40	84.30	3.33	3.90	1.24	31.96	22.45	25.72	3.49	88.31	94.24	33.83	100.13
43	26.23	4.15	1.06	1.21	38.81	27.01	21.69	4.21	88.33	96.91	33.98	102.69
46	3.45	3.88	2.12	0.69	32.34	20.77	15.12	3.29	66.91	74.67	25.25	78.83

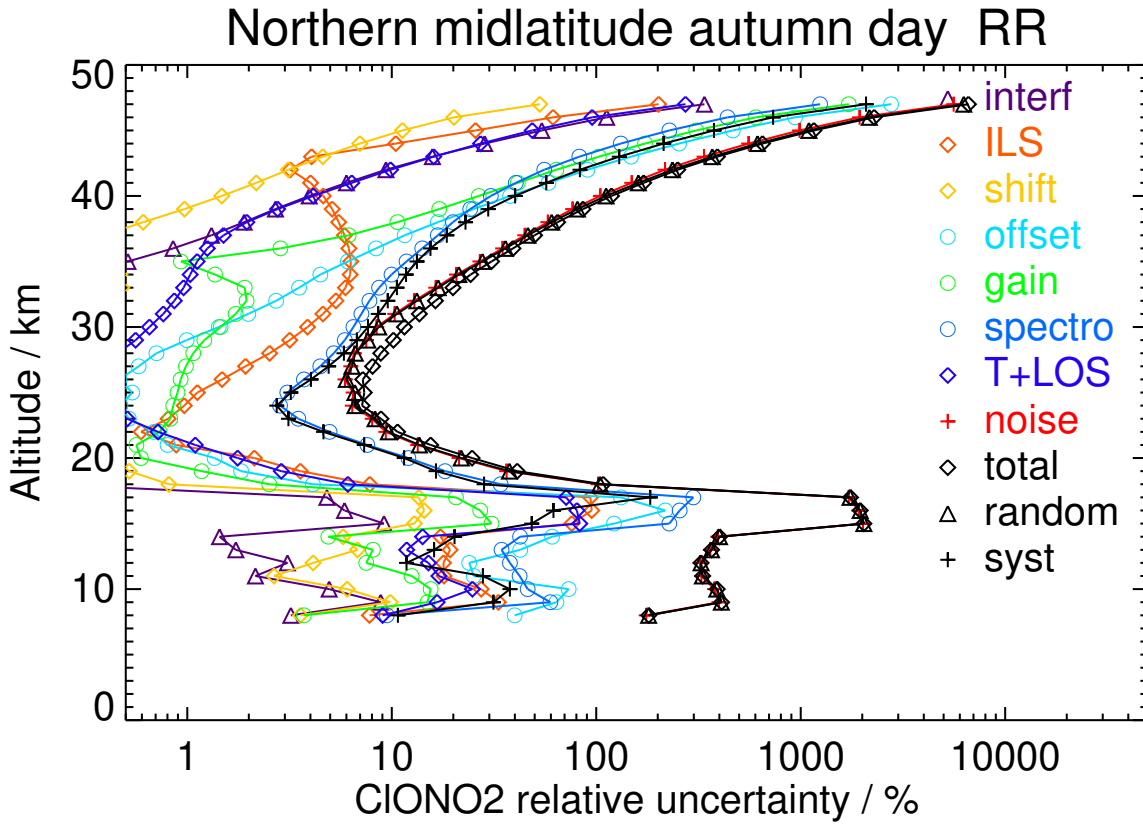


Figure S49: V8R_CLONO2_261 Northern midlatitude autumn day

Table S54: CIONO2 error budget for Northern midlatitude autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
10	-12.31	0.31	1.76	0.39	5.14	1.29	3.68	1.84	26.53	27.29	2.79	27.43
13	-2.89	0.11	1.35	0.46	1.61	0.51	2.46	0.87	25.62	25.81	1.22	25.84
16	9.27	0.12	1.73	0.23	1.96	0.45	4.90	1.43	29.72	30.18	2.27	30.27
19	130.53	0.11	4.02	0.57	1.79	1.05	19.76	3.06	35.02	36.27	18.21	40.58
22	526.00	0.15	2.48	0.85	3.15	3.87	22.41	3.37	40.77	41.90	21.27	46.99
25	903.20	0.24	9.82	1.06	4.26	8.54	27.45	2.89	50.58	51.57	29.15	59.24
28	1024.91	0.42	22.34	0.85	6.00	10.42	47.18	4.14	55.55	56.42	52.82	77.29
31	854.42	0.87	30.78	2.30	11.75	12.59	49.32	5.15	62.02	63.65	59.20	86.93
34	636.99	1.00	26.32	2.00	15.60	7.79	43.45	4.51	70.43	72.48	51.15	88.72
37	438.02	2.19	14.96	0.79	20.43	9.11	41.01	3.56	80.04	83.00	44.06	93.97
40	263.81	3.34	6.15	1.15	30.91	22.07	36.40	3.63	87.98	93.65	42.44	102.82
43	134.98	4.38	1.24	1.25	38.13	27.97	29.11	4.14	87.94	96.35	39.67	104.19
46	61.74	4.20	2.03	0.77	32.37	22.03	19.05	3.32	67.34	75.13	28.62	80.39

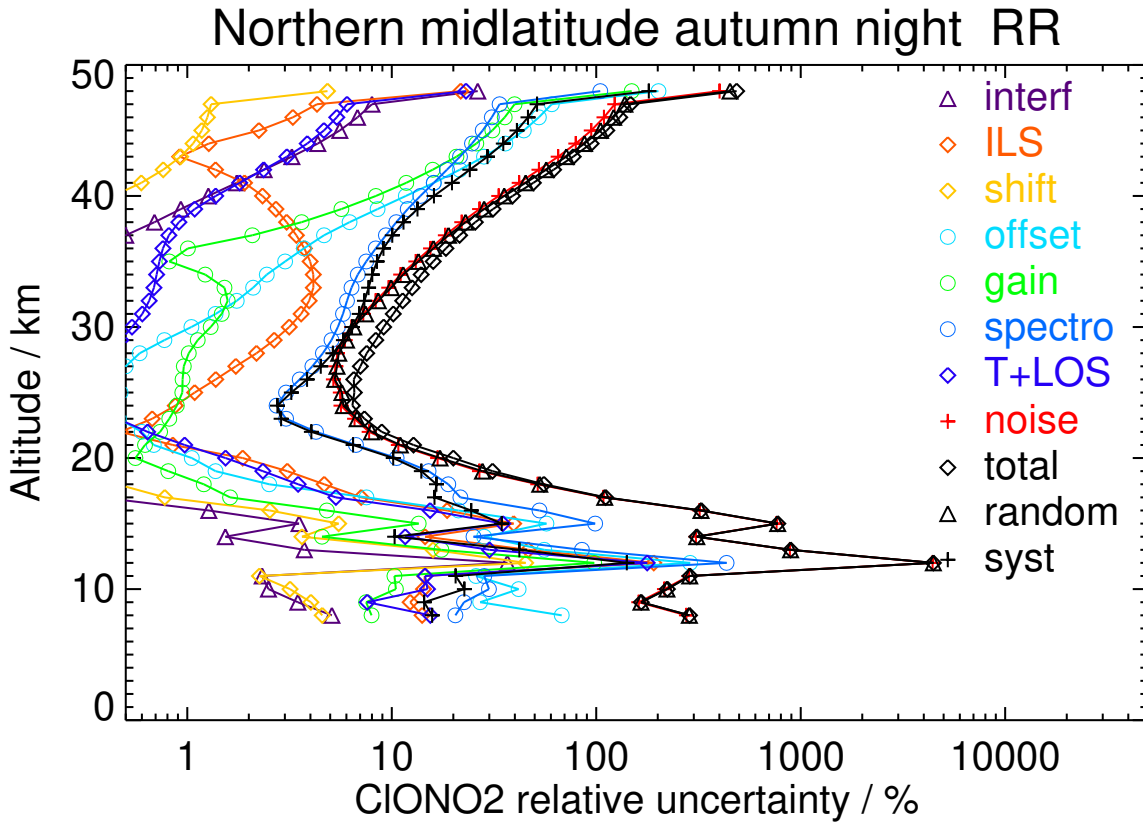


Figure S50: V8R_CLONO2.261 Northern midlatitude autumn night

Table S55: CLONO2 error budget for Tropics day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
10	-8.29	0.48	2.21	0.61	6.67	0.73	3.76	1.41	36.80	37.65	1.78	37.69
13	-17.14	0.13	1.36	0.31	2.87	0.34	1.59	0.86	26.79	27.02	1.03	27.04
16	-0.37	0.05	0.79	0.09	2.51	0.30	1.88	0.85	30.59	30.74	1.43	30.77
19	-6.07	0.05	1.84	0.62	1.46	0.46	7.26	1.21	37.02	37.42	5.52	37.83
22	200.87	0.10	2.01	0.61	2.31	2.01	14.32	2.24	42.34	43.01	12.89	44.90
25	413.80	0.13	7.31	0.62	3.18	4.23	16.20	1.60	48.60	50.06	14.24	52.05
28	447.09	0.23	18.41	0.53	5.03	5.72	23.12	2.04	54.29	55.41	28.51	62.32
31	361.73	0.63	26.27	1.66	10.64	8.78	21.80	2.49	62.01	63.35	34.59	72.18
34	214.03	0.92	23.99	1.72	16.24	8.06	16.80	2.04	69.36	71.49	29.92	77.50
37	108.88	1.99	12.50	1.02	17.31	9.74	21.70	2.30	75.05	77.32	26.20	81.64
40	42.99	2.89	3.55	2.51	25.28	27.26	25.73	4.24	81.01	85.32	37.03	93.01
43	9.13	4.13	1.25	2.65	34.66	35.29	27.01	5.15	83.22	90.76	43.78	100.77
46	-0.06	4.48	2.34	1.59	32.45	28.15	22.12	3.97	67.60	75.48	35.37	83.36
49	-31.14	3.47	2.16	0.74	24.18	18.08	15.30	2.33	46.07	52.33	23.50	57.36

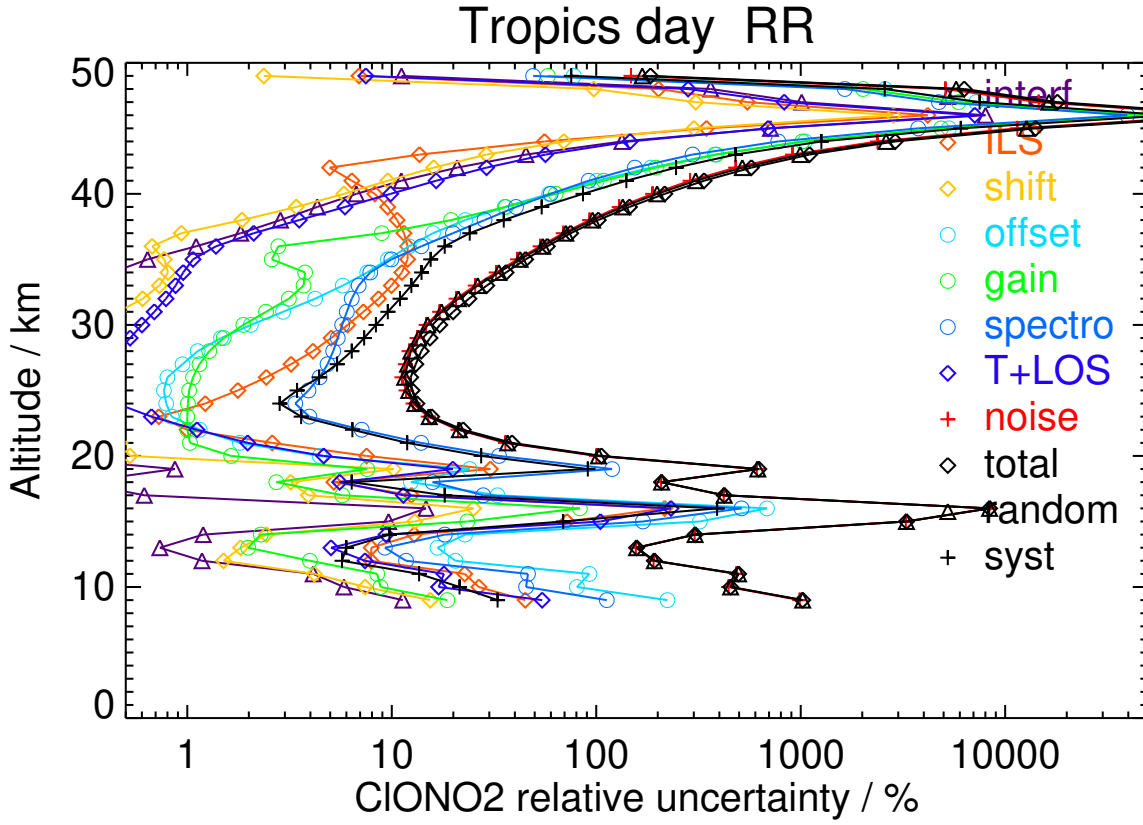


Figure S51: V8R_CLONO2_261 Tropics day

Table S56: CLONO2 error budget for Tropics night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
10	-31.04	0.60	2.59	0.67	6.98	1.04	3.81	1.44	38.38	39.18	3.36	39.33
13	-11.32	0.15	1.02	0.29	2.21	0.37	1.65	0.96	27.79	27.96	0.68	27.96
16	-11.69	0.09	0.83	0.13	2.59	0.30	1.87	0.95	32.01	32.18	0.99	32.19
19	9.41	0.13	2.08	0.52	1.52	0.52	7.74	1.42	38.59	38.99	6.14	39.47
22	232.46	0.17	1.52	0.60	2.27	2.04	15.93	2.69	44.63	45.09	15.22	47.59
25	521.26	0.20	6.22	0.77	3.21	4.91	15.13	1.94	50.29	51.04	15.17	53.25
28	669.55	0.34	19.64	0.61	5.50	8.19	25.60	2.32	57.01	57.86	32.36	66.29
31	641.68	0.76	30.75	2.08	11.44	12.40	29.89	3.39	64.64	66.29	43.85	79.49
34	508.63	1.02	27.59	2.18	15.76	9.47	29.72	3.28	71.46	73.59	41.10	84.29
37	344.63	2.22	14.36	0.50	16.87	11.12	35.92	3.44	76.64	78.89	39.66	88.29
40	180.29	3.14	4.89	2.03	25.84	28.89	36.99	4.44	82.22	86.66	46.68	98.43
43	71.47	4.36	0.98	2.41	35.10	36.57	34.63	4.97	84.01	91.63	49.80	104.29
46	19.13	4.63	1.86	1.52	32.61	28.64	25.89	3.79	67.73	75.66	38.19	84.75
49	0.18	3.74	1.54	0.75	24.33	18.37	16.79	2.43	46.45	52.77	24.65	58.24

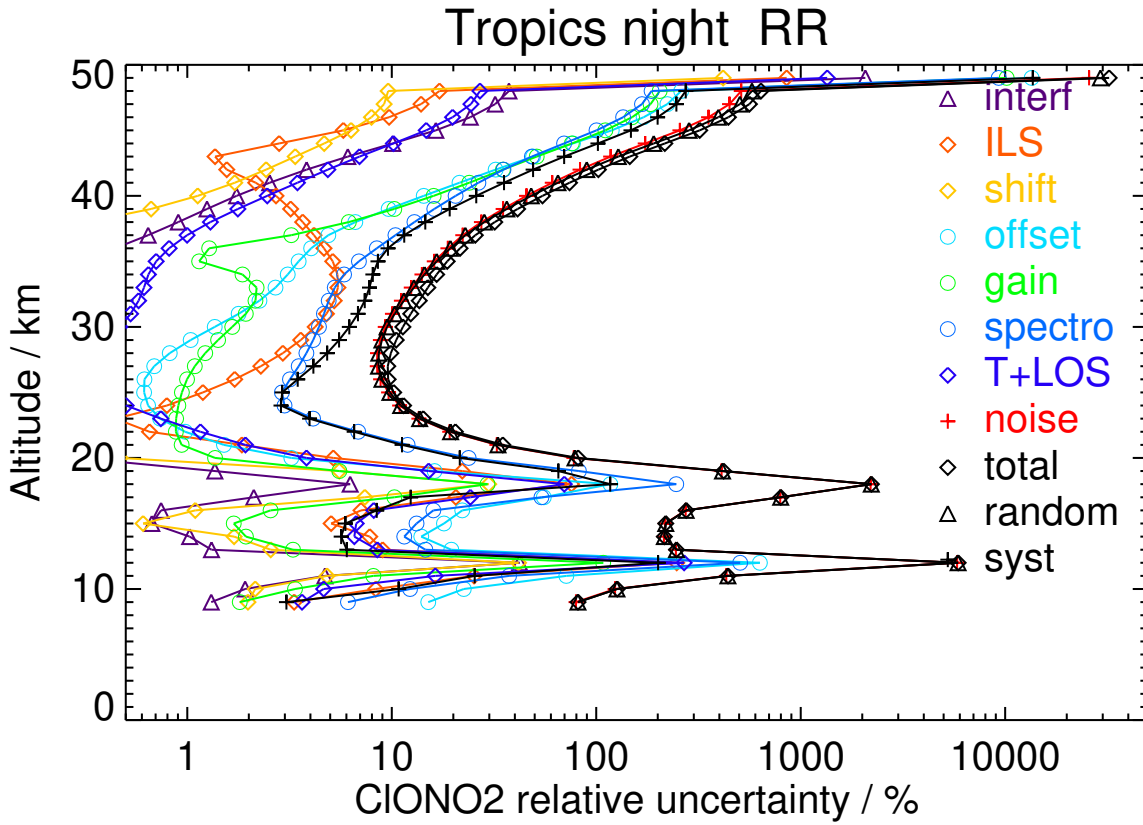


Figure S52: V8R.CLONO2.261 Tropics night

Table S57: CIONO2 error budget for Southern midlatitude winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-7.77	0.35	1.30	0.52	5.03	0.97	4.40	1.57	26.67	27.58	0.91	27.59
10	3.50	0.14	1.95	0.22	1.86	1.02	5.66	1.39	23.92	24.63	2.86	24.79
13	82.89	0.10	4.38	0.47	2.31	1.24	11.15	1.77	26.79	28.63	7.21	29.52
16	229.85	0.06	3.25	0.42	1.99	1.70	17.29	3.04	32.47	34.42	13.98	37.15
19	542.91	0.09	4.64	0.89	2.46	5.03	20.63	3.37	38.99	41.81	16.21	44.84
22	824.73	0.09	10.04	0.74	3.50	9.17	34.97	3.42	45.59	49.95	31.86	59.25
25	883.91	0.19	15.19	0.79	4.98	11.76	45.44	4.42	54.99	57.55	46.82	74.18
28	840.77	0.58	18.41	1.05	9.03	11.20	48.63	5.07	63.53	64.99	52.44	83.51
31	735.54	0.90	20.75	1.36	16.89	10.03	45.58	5.20	72.10	74.68	50.45	90.12
34	562.93	0.80	19.42	1.10	24.54	4.34	41.85	4.57	83.49	87.37	45.93	98.71
37	381.50	2.89	15.87	1.04	33.61	6.79	41.22	4.13	97.21	103.17	44.25	112.26
40	222.39	4.73	11.68	1.20	42.39	14.18	38.52	3.88	104.24	113.00	41.90	120.52
43	88.40	4.90	6.85	0.96	43.54	16.26	29.65	3.15	93.74	103.87	33.46	109.13
46	-20.88	3.87	1.99	0.59	33.89	16.30	18.61	2.41	66.96	75.38	24.23	79.18

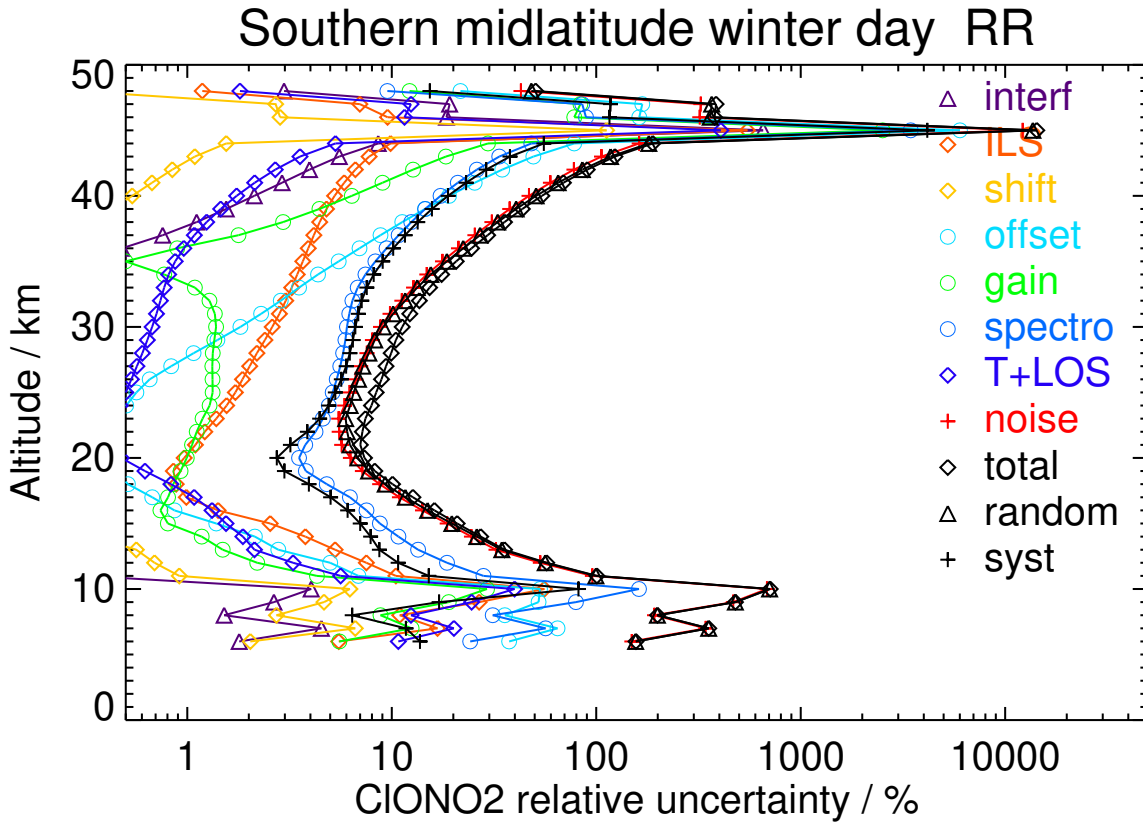


Figure S53: V8R_CLONO2.261 Southern midlatitude winter day

Table S58: CIONO2 error budget for Southern midlatitude winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-3.25	0.42	1.95	0.53	4.79	1.28	5.64	1.56	28.00	29.09	1.02	29.11
10	31.71	0.17	3.06	0.20	2.44	2.18	7.17	1.56	25.18	26.15	4.88	26.60
13	68.47	0.10	3.10	0.46	2.92	1.25	8.03	1.31	26.41	27.90	2.23	27.99
16	198.31	0.08	5.31	0.52	2.14	1.47	18.81	3.20	31.64	33.60	16.48	37.42
19	535.47	0.10	4.66	0.96	2.43	4.52	23.66	3.93	38.24	41.14	19.85	45.67
22	890.94	0.12	10.57	0.66	3.46	9.19	30.89	3.23	44.52	47.18	30.48	56.17
25	981.39	0.30	15.93	0.85	5.16	11.68	48.70	4.60	55.68	57.25	51.31	76.88
28	923.13	0.73	19.63	1.10	9.13	11.78	51.77	5.24	62.75	64.06	56.14	85.18
31	831.19	1.12	21.51	1.45	16.93	10.66	48.35	5.35	72.50	75.01	53.50	92.13
34	677.68	1.07	19.48	1.12	23.93	4.70	45.99	4.69	81.98	85.79	49.74	99.16
37	477.92	3.12	15.06	0.90	33.04	7.02	45.71	4.34	95.34	101.19	48.33	112.14
40	298.78	4.75	10.84	1.13	42.18	14.09	42.30	4.08	102.86	111.55	45.40	120.44
43	152.48	4.72	6.45	0.94	43.38	15.38	32.57	3.16	92.95	102.99	35.88	109.06
46	67.93	3.57	2.32	0.57	33.37	13.29	19.83	2.05	65.70	73.95	23.54	77.60

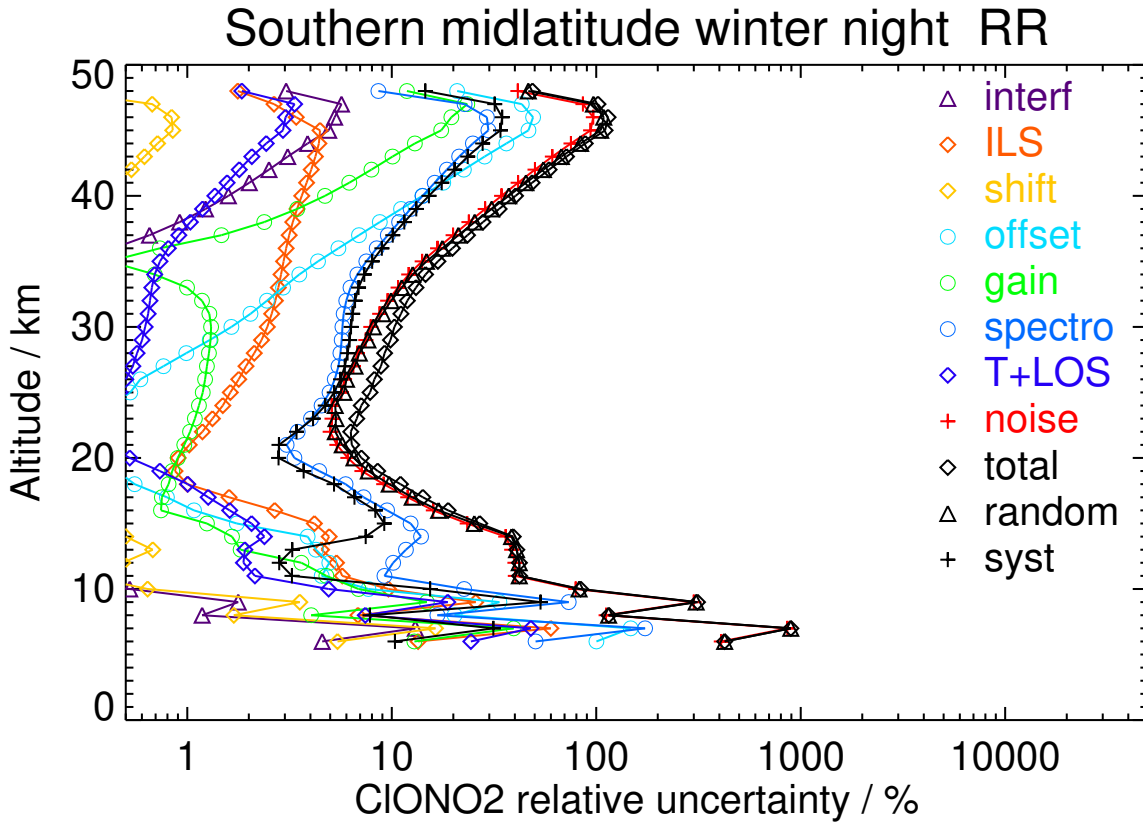


Figure S54: V8R_CLONO2_261 Southern midlatitude winter night

Table S59: CIONO2 error budget for Southern midlatitude spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-20.47	0.43	1.97	0.61	5.60	0.83	4.55	1.51	29.41	30.37	1.49	30.40
10	1.37	0.16	2.28	0.38	1.63	0.56	5.13	1.37	24.01	24.70	1.82	24.76
13	39.30	0.10	5.80	0.52	1.96	1.30	11.93	1.77	26.24	29.22	4.38	29.55
16	187.19	0.09	9.73	0.50	2.05	2.12	22.82	3.50	30.96	35.89	17.52	39.94
19	514.20	0.11	7.63	1.09	2.11	5.99	25.95	3.56	35.78	42.90	15.04	45.46
22	746.32	0.11	11.34	0.84	2.82	8.97	27.33	2.84	40.72	42.84	28.20	51.29
25	762.91	0.13	16.48	0.87	3.65	9.82	36.88	3.33	48.88	49.60	41.02	64.36
28	673.32	0.33	22.79	1.04	5.67	9.04	37.25	3.41	54.28	54.96	44.28	70.57
31	482.55	0.87	27.08	1.79	11.65	10.14	30.57	3.27	60.84	62.32	41.70	74.98
34	264.69	1.11	19.95	1.17	14.14	3.94	26.01	2.59	68.95	70.57	32.76	77.80
37	114.64	2.56	9.67	0.78	18.02	11.46	28.21	2.68	77.23	79.64	31.35	85.59
40	42.95	3.73	4.75	1.48	28.90	22.43	26.05	3.35	84.76	89.94	34.08	96.18
43	5.82	4.72	1.95	1.33	36.76	26.59	22.53	3.75	86.16	94.12	34.25	100.16
46	-18.42	4.32	1.46	0.73	32.03	20.47	15.06	2.98	67.36	74.94	24.96	78.99

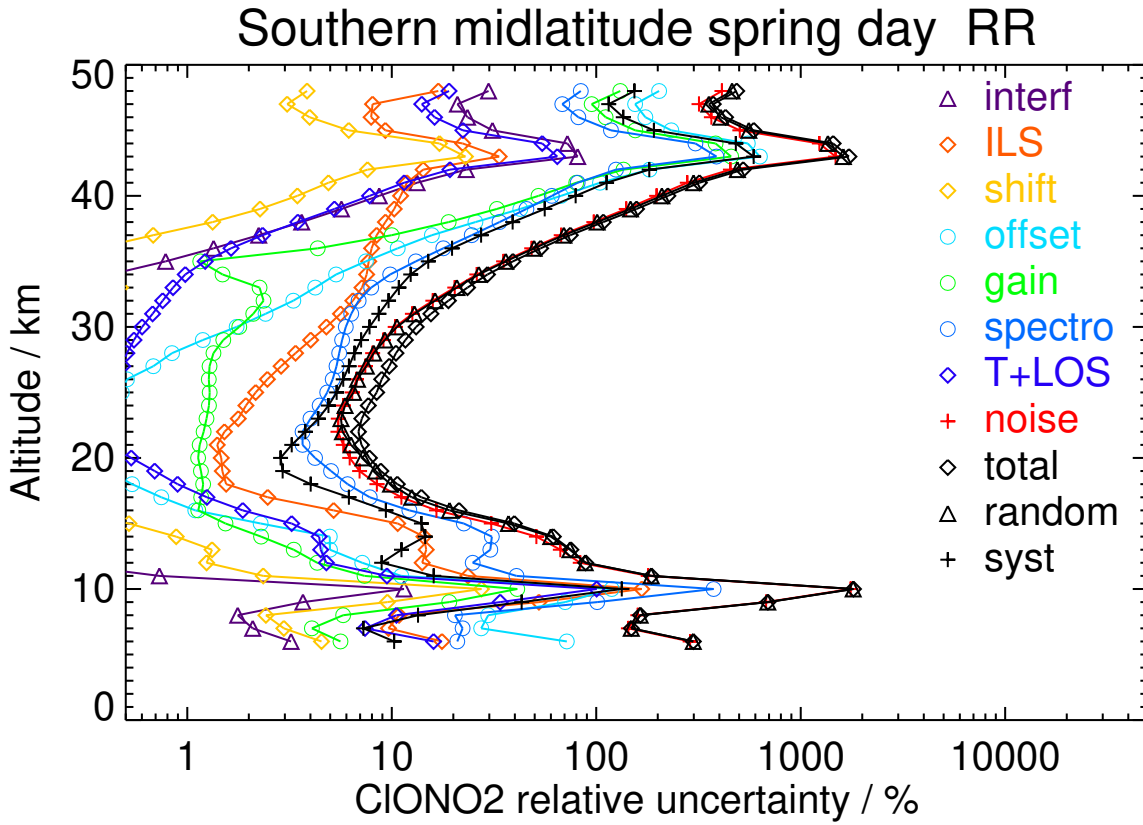


Figure S55: V8R_CLONO2.261 Southern midlatitude spring day

Table S60: CLONO2 error budget for Southern midlatitude spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-20.41	0.45	2.20	0.56	4.72	1.29	3.61	1.62	28.15	28.87	1.86	28.93
10	9.88	0.17	3.08	0.33	2.52	1.07	5.54	1.55	24.95	25.71	3.45	25.94
13	42.36	0.12	3.97	0.51	3.09	1.73	8.45	1.55	26.77	28.49	2.67	28.62
16	164.73	0.12	10.74	0.75	2.37	2.18	25.16	3.78	31.76	38.07	18.25	42.22
19	548.21	0.17	8.61	1.17	2.49	6.60	30.81	4.45	37.42	46.57	18.04	49.94
22	858.55	0.20	11.24	1.06	3.27	9.59	33.31	3.74	42.02	47.59	29.23	55.85
25	995.95	0.22	19.29	0.89	3.90	10.69	43.23	4.33	49.73	51.32	47.21	69.74
28	894.02	0.39	32.06	1.64	6.12	10.55	48.05	4.78	54.67	57.03	56.99	80.63
31	680.38	0.94	34.03	2.26	12.15	12.27	38.08	4.10	61.26	63.12	51.94	81.75
34	521.23	1.24	23.95	1.44	14.55	6.05	33.13	3.20	69.19	71.04	40.91	81.98
37	373.74	2.69	11.27	0.88	17.59	12.84	37.46	3.39	76.89	79.43	40.33	89.08
40	222.46	4.00	5.40	1.51	28.27	24.82	36.30	3.63	83.50	88.81	43.32	98.82
43	100.55	5.17	2.39	1.32	36.46	29.18	29.55	3.75	85.38	93.48	40.64	101.94
46	30.34	4.64	1.73	0.71	32.02	22.31	18.50	3.00	67.31	75.00	28.39	80.19

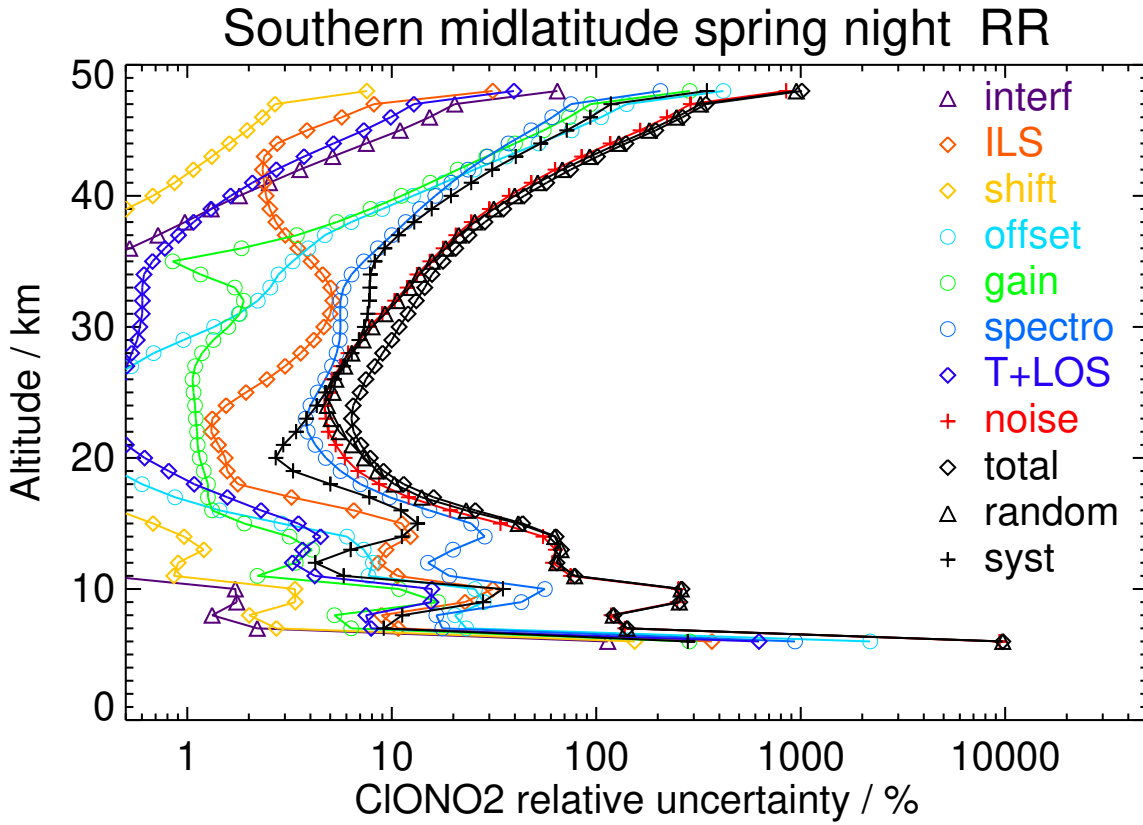


Figure S56: V8R_CLONO2_261 Southern midlatitude spring night

Table S61: CIONO2 error budget for Southern midlatitude summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	5.62	0.84	2.16	0.59	8.29	1.13	5.28	2.46	36.12	37.59	1.07	37.61
10	-2.34	0.29	2.46	0.44	2.50	1.16	4.91	1.74	24.70	25.37	2.74	25.51
13	7.59	0.15	2.09	0.47	2.43	0.45	3.46	0.94	25.04	25.43	2.03	25.51
16	3.87	0.12	2.98	0.25	2.29	0.59	6.20	1.45	29.31	30.14	2.34	30.23
19	165.41	0.10	3.91	0.63	1.72	0.90	19.63	3.12	34.07	34.91	18.89	39.70
22	524.47	0.13	3.85	0.57	2.80	5.30	18.04	2.66	39.19	40.74	16.10	43.81
25	743.10	0.16	12.20	0.90	3.84	8.55	27.39	2.60	48.22	48.84	30.57	57.62
28	747.71	0.29	25.92	0.76	5.36	8.78	38.33	3.69	52.02	52.70	46.80	70.48
31	509.89	0.81	33.79	2.41	11.28	10.33	33.27	3.97	59.33	60.90	48.12	77.62
34	223.59	1.12	23.80	1.83	13.92	4.92	23.30	2.71	66.16	67.89	33.27	75.61
37	59.60	2.73	10.64	1.08	14.37	12.62	22.34	2.59	72.23	74.22	26.49	78.80
40	44.54	3.45	4.83	2.47	22.28	26.30	24.67	4.01	76.45	80.19	35.60	87.74
43	44.89	4.53	2.49	2.54	31.88	33.16	28.79	4.40	79.50	86.25	43.34	96.53
46	21.33	4.75	1.13	1.55	31.68	26.50	24.17	3.26	67.20	74.75	35.43	82.72
49	15.39	3.39	0.55	0.77	23.81	16.47	15.47	1.96	46.55	52.56	22.33	57.11

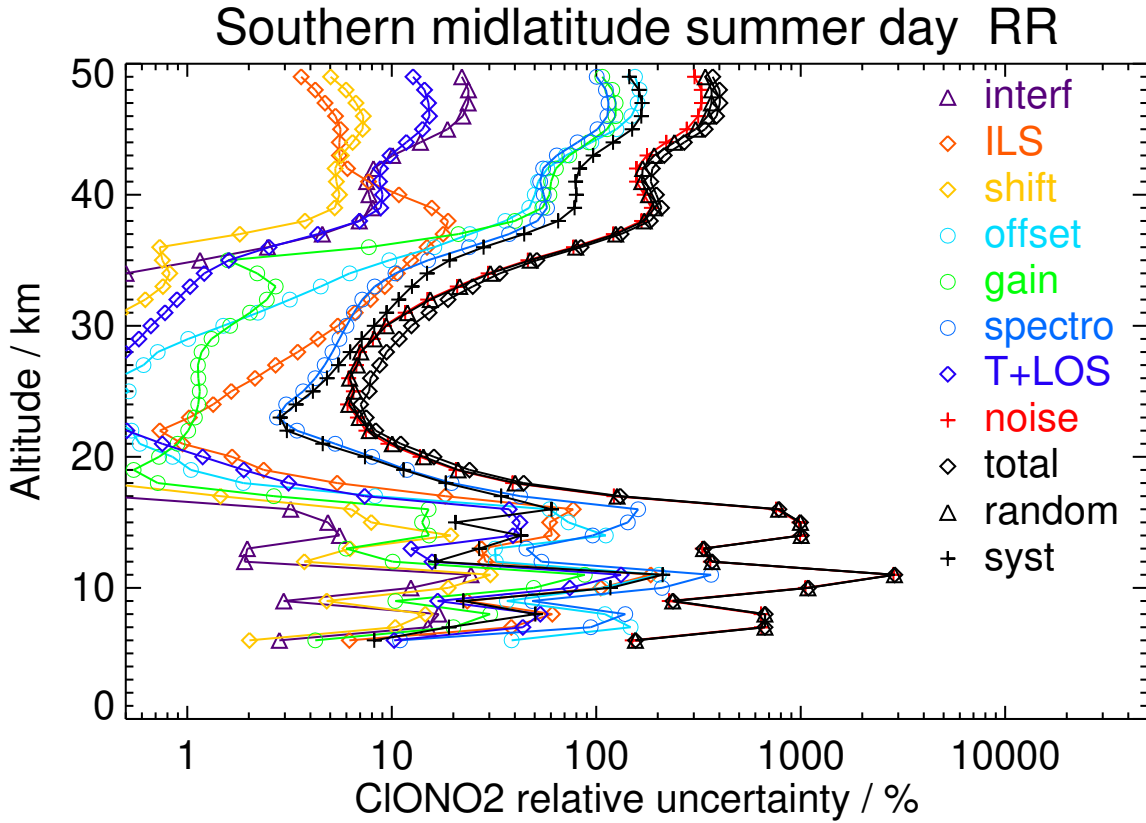


Figure S57: V8R_CLONO2_261 Southern midlatitude summer day

Table S62: CIONO2 error budget for Southern midlatitude summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-2.88	0.83	2.66	0.54	6.04	1.30	3.94	1.96	32.76	33.69	1.99	33.75
10	3.49	0.25	1.97	0.38	3.36	0.77	3.39	1.49	27.01	27.52	1.26	27.55
13	-4.10	0.20	2.48	0.55	3.46	0.53	3.24	1.03	25.53	26.03	2.21	26.12
16	24.75	0.15	2.47	0.26	2.59	0.53	4.94	1.48	29.42	30.01	2.09	30.09
19	169.53	0.16	5.68	0.68	1.88	0.89	21.64	3.40	34.27	35.58	20.61	41.12
22	579.07	0.21	4.79	0.53	2.86	5.42	20.53	2.98	39.61	41.88	17.49	45.39
25	862.95	0.27	12.10	1.05	3.86	10.20	29.17	2.89	48.14	49.03	32.23	58.68
28	950.16	0.39	27.82	0.78	5.40	11.78	40.67	3.86	52.24	53.02	50.29	73.08
31	821.04	0.82	40.28	2.65	11.44	13.93	39.92	4.55	59.22	61.07	57.85	84.12
34	553.68	1.18	30.72	2.41	14.32	8.13	34.40	3.85	66.01	68.02	46.36	82.32
37	321.02	2.76	12.95	0.84	14.26	12.43	34.65	3.33	71.85	73.96	37.92	83.12
40	167.56	3.13	4.43	2.23	21.25	27.46	34.66	3.85	75.35	78.91	43.68	90.19
43	59.04	4.78	1.62	2.41	31.17	34.68	35.34	4.07	78.40	85.00	48.92	98.07
46	14.44	5.25	1.25	1.46	31.56	27.48	27.41	2.97	66.93	74.51	38.35	83.80
49	6.89	3.68	0.68	0.71	24.04	16.87	16.83	1.77	46.85	52.95	23.54	57.95

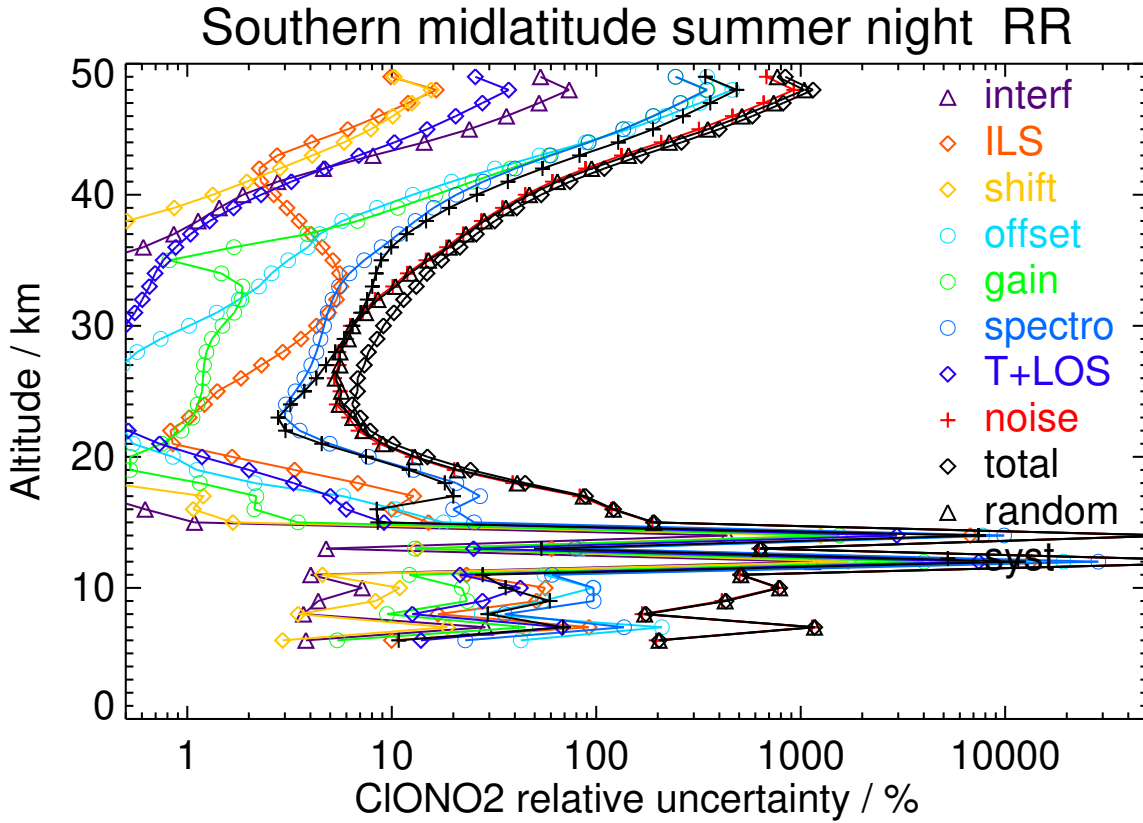


Figure S58: V8R_CLONO2_261 Southern midlatitude summer night

Table S63: CLONO2 error budget for Southern midlatitude autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-6.20	0.54	2.34	0.54	5.02	1.47	5.74	1.96	28.16	29.37	0.79	29.38
10	5.35	0.20	1.30	0.29	1.80	0.99	3.48	1.23	23.65	24.05	0.71	24.06
13	7.38	0.11	2.37	0.54	2.48	0.81	4.03	1.02	26.34	26.85	1.78	26.90
16	62.04	0.07	2.98	0.27	1.81	1.22	9.14	1.75	31.31	32.06	7.29	32.88
19	262.23	0.08	2.35	0.94	1.91	1.45	18.41	2.81	37.28	38.42	16.51	41.82
22	597.75	0.09	5.17	0.71	2.89	4.34	18.87	2.46	43.46	45.25	16.04	48.01
25	802.48	0.15	11.55	0.84	4.07	7.64	32.97	2.85	51.29	52.34	34.57	62.73
28	791.46	0.43	19.45	0.94	6.75	9.34	41.68	3.84	57.93	58.71	46.62	74.97
31	635.35	0.89	23.45	1.82	12.98	10.29	39.59	4.28	64.59	66.29	46.81	81.16
34	404.45	1.11	18.73	1.31	16.37	3.96	35.75	3.61	72.72	74.77	40.31	84.95
37	227.48	2.72	10.54	0.66	23.58	10.30	33.78	3.06	83.41	86.98	36.37	94.28
40	124.58	3.95	5.61	0.96	35.37	19.54	28.78	3.23	92.98	99.92	34.35	105.66
43	56.50	4.56	2.53	0.85	40.61	22.11	21.85	3.36	90.40	99.62	30.05	104.05
46	21.82	3.75	1.57	0.49	32.31	16.55	13.59	2.59	65.90	73.80	20.57	76.61

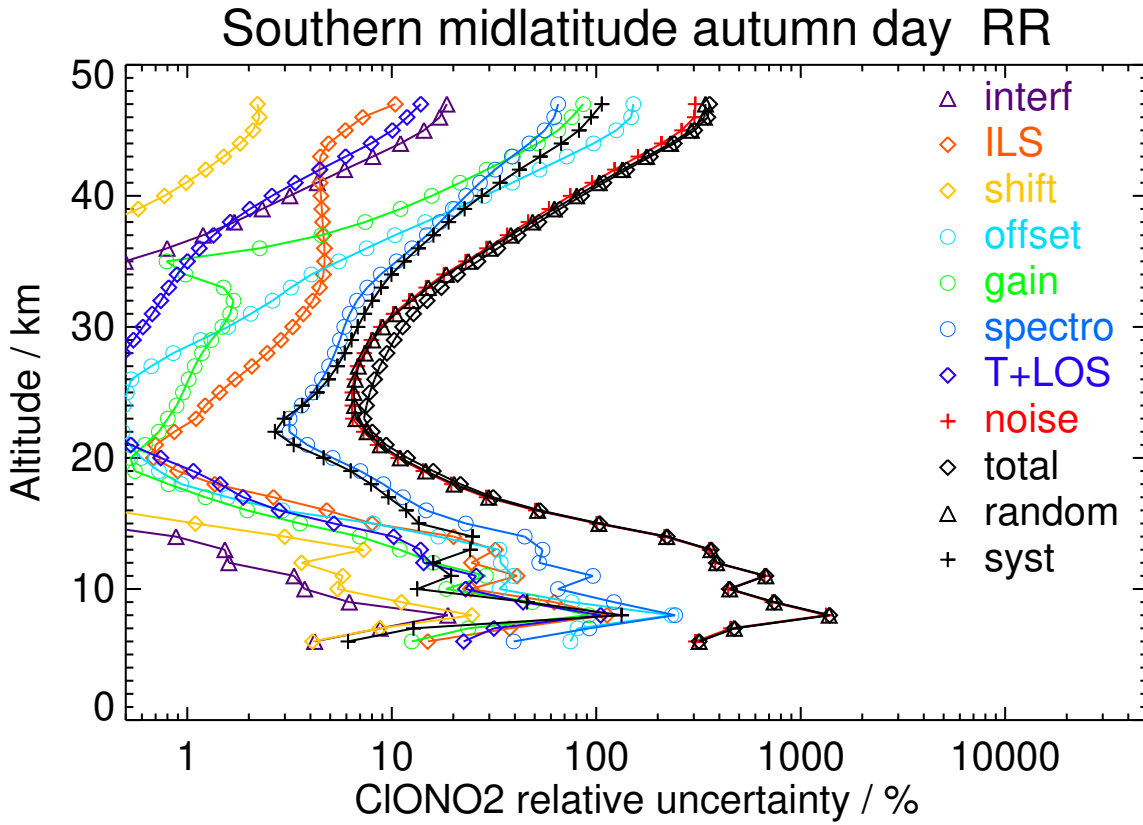


Figure S59: V8R_CLONO2_261 Southern midlatitude autumn day

Table S64: CIONO2 error budget for Southern midlatitude autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-9.91	0.66	1.46	0.52	4.96	1.65	3.50	1.69	28.96	29.69	1.49	29.73
10	-3.83	0.24	2.20	0.27	2.34	1.32	3.69	1.30	24.36	24.91	0.54	24.92
13	-4.56	0.14	2.42	0.53	2.63	0.59	3.02	1.03	25.54	25.90	2.21	26.00
16	70.47	0.11	4.15	0.30	2.08	1.21	11.86	2.11	30.33	31.39	10.14	32.99
19	299.07	0.10	2.36	1.00	1.89	1.80	18.62	3.00	35.98	37.43	16.20	40.79
22	625.62	0.14	5.34	0.69	2.95	4.87	20.58	2.60	41.81	44.21	16.88	47.32
25	880.81	0.24	10.85	0.95	4.46	8.04	31.89	2.99	51.61	52.82	33.21	62.39
28	902.69	0.50	20.21	0.80	6.51	10.27	42.94	3.80	56.34	57.30	48.03	74.77
31	812.66	1.01	26.42	1.90	12.95	12.07	43.06	4.28	64.32	66.24	51.35	83.81
34	668.25	1.09	23.09	1.79	16.40	6.60	42.00	3.97	71.90	74.17	47.95	88.32
37	467.52	2.71	12.86	0.76	22.70	9.90	42.97	3.76	82.02	85.45	45.54	96.83
40	268.59	4.06	6.26	0.98	33.97	20.85	38.22	3.70	91.01	97.64	43.23	106.78
43	114.27	4.77	2.74	0.94	39.84	24.08	28.80	3.54	89.37	98.43	36.60	105.01
46	31.15	4.00	1.82	0.54	32.26	18.06	16.92	2.61	66.08	73.95	24.01	77.75

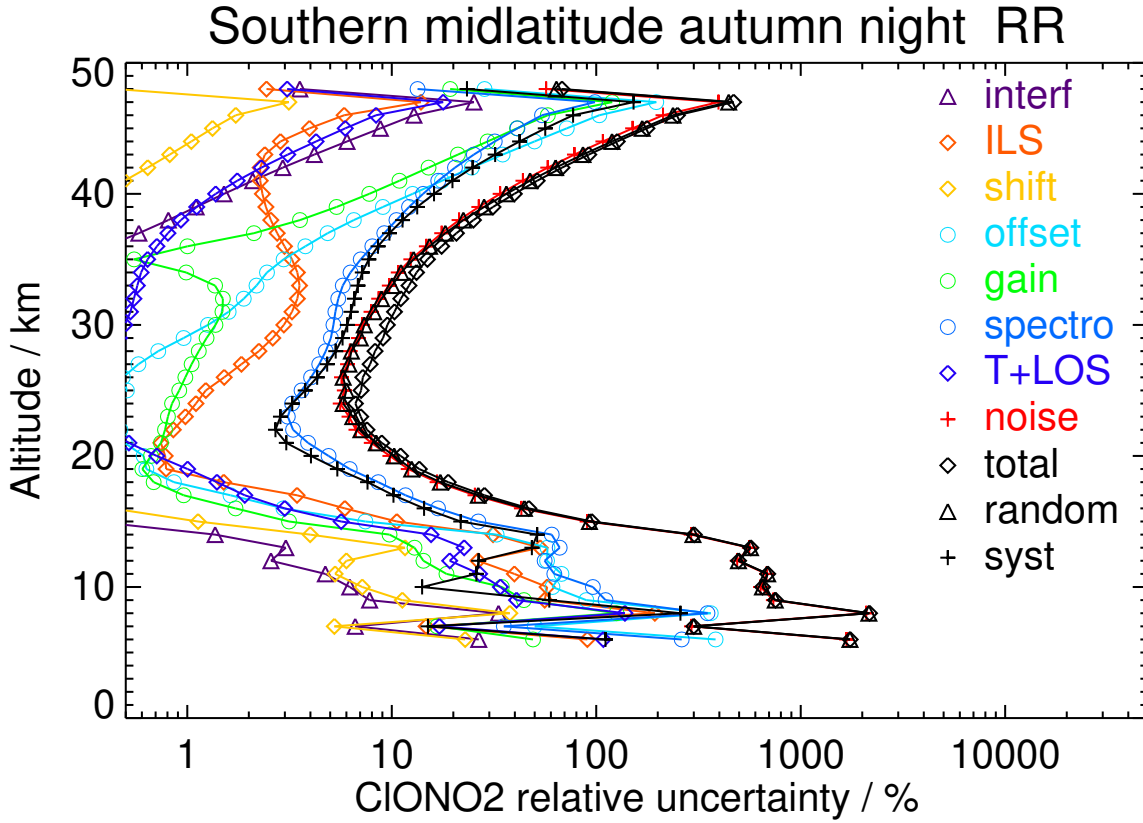


Figure S60: V8R_CLONO2.261 Southern midlatitude autumn night

Table S65: CLONO2 error budget for Southern polar winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	1.94	0.26	2.32	0.34	7.89	1.20	7.34	2.23	30.97	32.93	1.68	32.97
10	16.83	0.10	3.43	0.33	2.43	1.15	10.84	2.12	27.40	29.30	5.81	29.87
13	178.04	0.10	7.70	0.47	3.24	2.14	22.33	3.64	31.43	37.16	13.93	39.68
16	380.86	0.08	5.62	0.58	2.85	5.37	26.30	4.73	37.32	44.78	13.05	46.64
19	740.64	0.10	9.02	1.03	4.29	9.83	42.64	7.29	45.34	58.42	26.67	64.22
22	1395.25	0.14	17.10	1.20	5.65	14.17	69.83	8.79	53.36	75.97	50.55	91.25
25	1376.06	0.34	30.62	1.65	7.21	15.03	91.47	10.24	61.78	73.00	90.43	116.22
28	1035.04	0.82	35.94	2.60	11.80	12.38	80.42	10.35	69.83	75.03	86.10	114.20
31	727.81	1.09	30.95	2.00	19.58	8.22	58.79	8.06	75.89	79.92	65.62	103.41
34	467.37	0.80	23.99	1.33	27.40	2.53	41.34	5.48	86.72	91.48	47.17	102.93
37	273.56	3.65	15.69	1.18	35.31	8.87	30.77	3.59	98.66	105.17	34.94	110.82
40	139.92	5.88	8.14	1.07	43.13	17.76	24.28	3.75	105.95	114.91	30.04	118.77
43	52.87	5.65	3.70	0.79	44.21	19.72	17.96	3.81	95.41	105.68	25.73	108.77
46	16.92	3.83	2.49	0.43	33.93	15.73	11.29	2.88	66.27	74.79	18.80	77.11

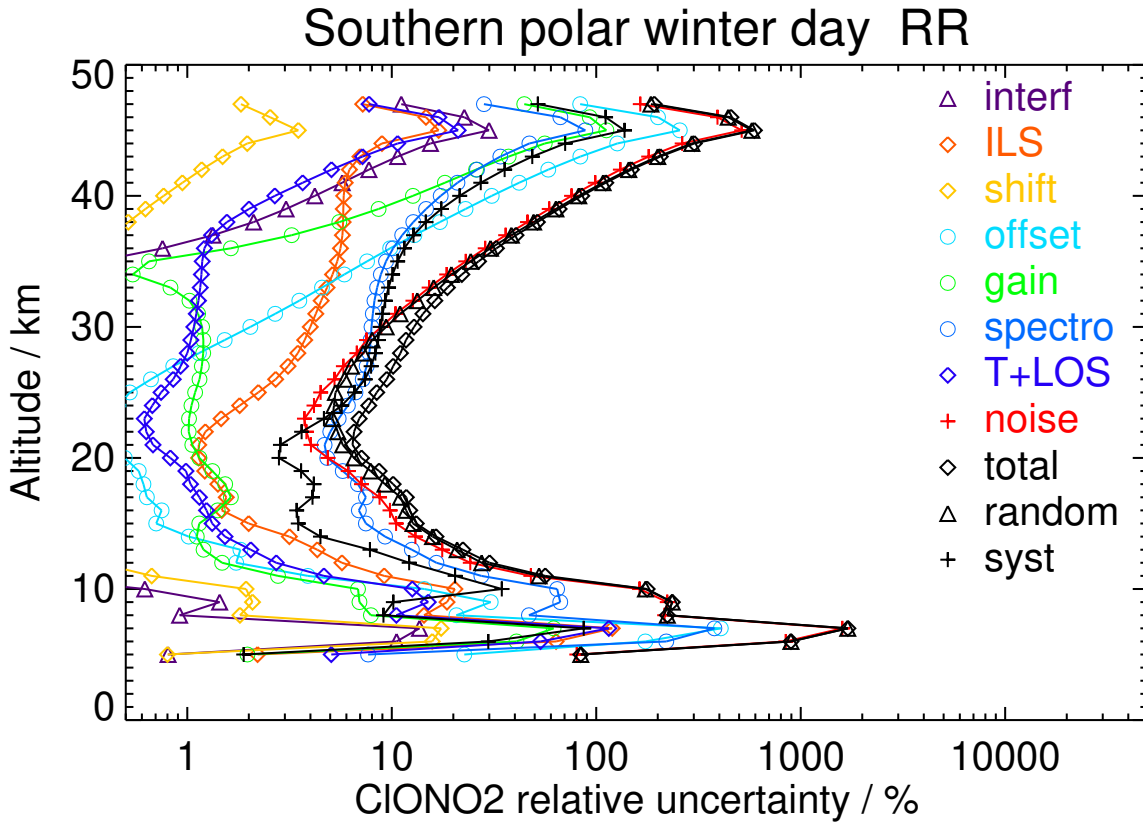


Figure S61: V8R_CLONO2.261 Southern polar winter day

Table S66: CLONO2 error budget for Southern polar winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-13.69	0.31	2.58	0.35	7.52	1.11	4.88	2.29	30.18	31.48	3.69	31.70
10	20.81	0.12	2.62	0.28	2.96	0.88	8.15	1.85	27.73	28.83	4.89	29.25
13	132.19	0.10	5.03	0.43	3.31	1.40	15.21	2.71	31.39	33.93	10.52	35.53
16	335.04	0.07	9.74	0.86	3.02	5.99	32.33	4.72	37.18	49.14	13.27	50.90
19	624.40	0.11	7.36	1.27	3.90	13.58	35.67	5.68	45.21	56.70	19.73	60.03
22	1130.53	0.18	19.25	1.52	5.43	11.12	63.32	8.61	53.50	80.64	31.11	86.44
25	1463.66	0.43	28.00	2.06	7.22	13.95	78.13	8.79	61.69	76.15	72.27	104.98
28	1255.33	0.83	37.09	2.94	11.95	13.46	84.76	10.29	70.72	77.22	89.65	118.32
31	934.61	1.10	34.92	2.22	19.97	9.84	71.04	9.27	76.41	81.25	78.03	112.65
34	640.24	0.72	27.86	1.36	28.52	4.37	54.17	7.02	87.55	93.20	59.78	110.73
37	375.27	3.02	18.38	1.16	35.91	6.80	41.51	4.74	99.21	106.36	44.26	115.20
40	176.34	5.46	9.49	1.05	42.81	16.63	31.77	4.13	106.25	115.47	34.81	120.61
43	66.95	5.55	4.57	0.78	43.63	19.24	21.90	3.73	95.25	105.55	27.39	109.05
46	16.84	4.39	2.91	0.41	33.37	17.12	11.78	2.93	66.12	74.46	20.25	77.16

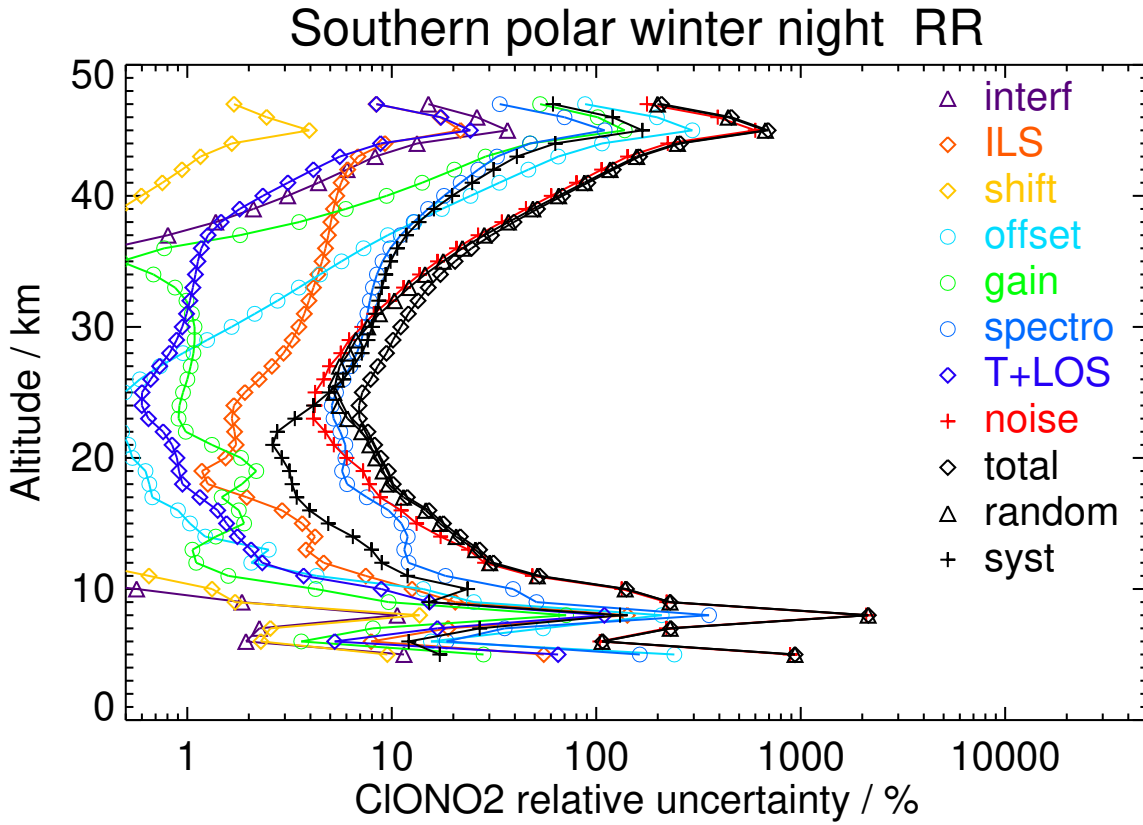


Figure S62: V8R_CLONO2_261 Southern polar winter night

Table S67: CLONO2 error budget for Southern polar spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-10.77	0.32	2.38	0.36	6.01	0.86	4.82	1.82	28.29	29.40	2.32	29.49
10	0.92	0.12	7.44	0.35	1.91	1.53	13.57	2.43	27.11	30.27	8.38	31.41
13	182.71	0.14	14.99	0.59	2.86	3.36	25.01	3.73	30.46	40.76	12.26	42.56
16	315.20	0.11	13.05	0.51	2.37	5.26	27.01	4.25	35.23	45.96	8.98	46.83
19	457.62	0.12	14.11	1.07	2.49	9.05	32.78	4.75	40.44	52.67	15.69	54.96
22	860.44	0.16	11.54	0.93	3.17	11.18	27.90	3.69	45.89	49.65	26.48	56.27
25	900.22	0.16	23.98	0.96	3.41	9.59	45.14	4.67	49.66	51.20	50.83	72.15
28	648.90	0.29	30.82	1.61	5.68	6.85	42.97	4.77	58.21	59.89	51.98	79.30
31	384.59	0.77	28.00	1.81	10.74	6.59	28.72	2.96	60.61	62.07	40.01	73.85
34	218.90	1.11	23.56	1.49	16.55	5.45	17.58	1.99	71.19	73.40	29.25	79.02
37	126.59	2.28	13.36	1.30	19.43	10.27	16.92	2.45	79.03	81.92	22.28	84.89
40	67.57	4.00	5.51	2.07	26.10	26.26	20.25	3.85	83.79	88.68	31.68	94.17
43	29.31	5.19	3.23	1.97	34.38	31.86	19.03	4.45	84.60	92.20	35.74	98.88
46	12.12	4.69	2.44	1.12	30.87	24.81	13.57	3.59	67.34	74.65	27.50	79.56

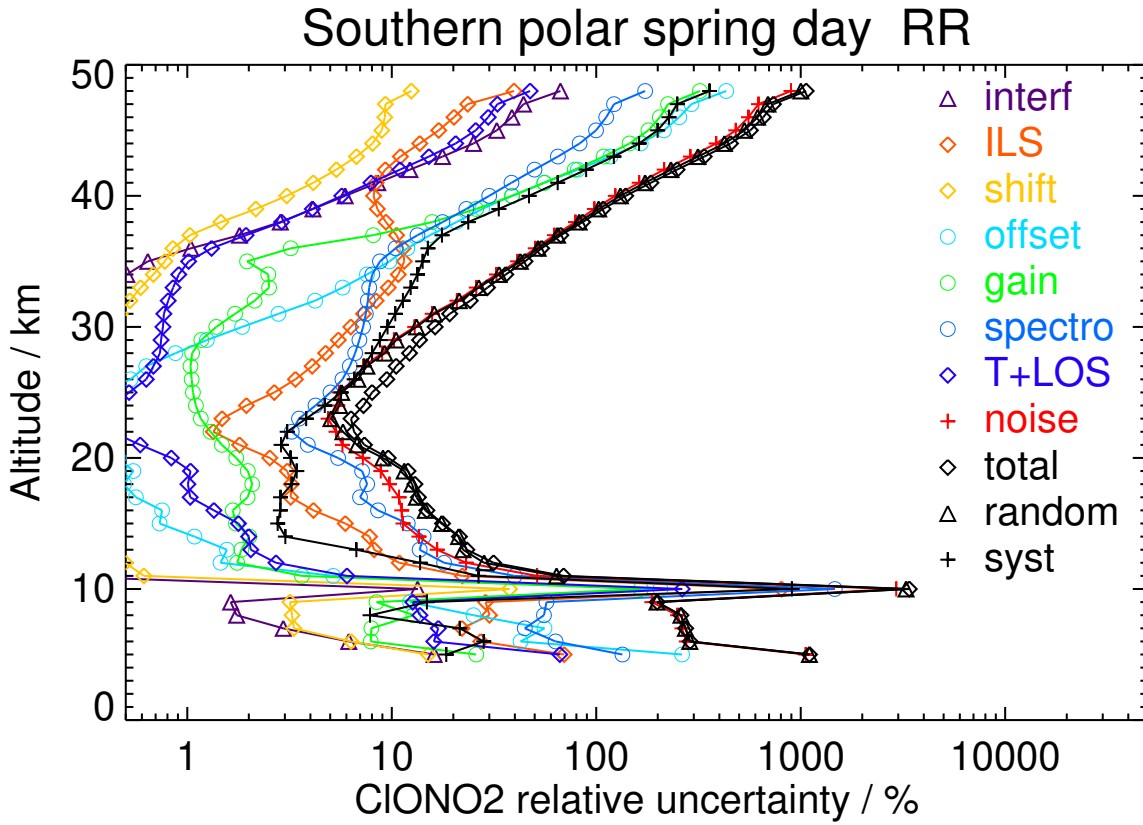


Figure S63: V8R_CLONO2.261 Southern polar spring day

Table S68: CLONO2 error budget for Southern polar spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-18.74	0.29	2.82	0.38	6.06	1.42	3.93	1.80	29.40	30.45	1.57	30.49
10	27.72	0.13	5.33	0.30	2.64	1.77	8.52	1.94	27.48	29.21	4.17	29.50
13	166.97	0.21	20.63	0.65	3.35	4.25	33.71	4.66	30.54	44.20	24.35	50.46
16	528.37	0.16	20.27	0.68	3.12	9.50	32.43	5.16	34.45	51.10	12.86	52.69
19	583.62	0.17	17.10	1.09	2.86	10.82	40.55	4.85	39.24	56.57	20.63	60.22
22	909.40	0.20	11.90	0.92	2.91	11.93	28.82	3.54	44.47	47.51	29.27	55.81
25	1000.27	0.22	23.05	1.11	3.37	12.61	45.30	4.30	48.37	50.15	50.98	71.51
28	835.55	0.33	31.14	1.57	5.62	9.86	46.38	4.71	57.44	59.24	55.37	81.08
31	647.68	0.75	32.49	2.10	10.58	9.56	36.27	3.66	60.22	61.67	49.16	78.86
34	453.15	1.13	28.72	1.76	16.16	7.60	27.16	2.80	70.61	72.76	39.83	82.95
37	295.10	2.15	16.35	0.89	18.90	9.27	26.27	2.63	78.20	80.99	31.12	86.76
40	170.36	3.76	6.04	1.65	26.06	25.14	28.37	3.67	83.32	88.14	36.84	95.52
43	84.33	5.30	3.24	1.67	34.46	30.37	25.01	4.00	84.35	91.91	38.20	99.53
46	43.60	5.09	2.57	0.94	30.83	23.42	16.62	3.16	67.26	74.54	28.04	79.64

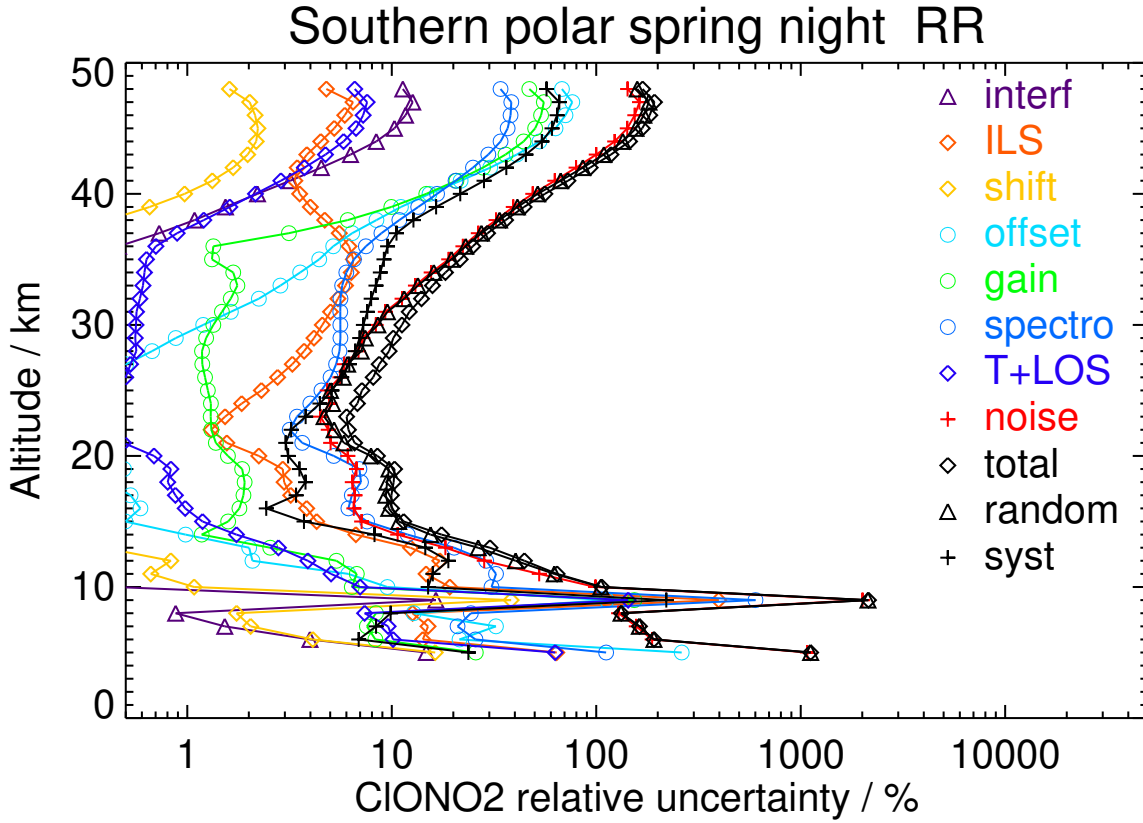


Figure S64: V8R_CLONO2_261 Southern polar spring night

Table S69: CLONO2 error budget for Southern polar summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-10.03	0.63	2.15	0.41	6.10	1.35	5.88	2.87	28.98	30.12	4.40	30.44
10	11.52	0.17	1.42	0.30	2.64	0.61	3.16	1.16	24.46	24.83	1.68	24.88
13	9.44	0.17	2.51	0.58	3.66	0.68	4.22	1.16	26.77	27.27	3.56	27.51
16	42.93	0.12	3.58	0.29	2.78	0.80	7.31	1.59	30.30	30.78	6.94	31.55
19	249.11	0.11	2.30	0.55	2.45	0.77	16.80	2.51	34.67	35.23	16.17	38.76
22	506.22	0.13	8.40	0.84	2.56	6.56	18.74	1.56	40.44	41.30	20.11	45.93
25	420.83	0.13	12.46	0.59	2.54	6.70	25.26	2.03	42.71	43.27	28.30	51.70
28	368.50	0.25	15.02	0.51	4.77	5.32	20.53	1.76	54.08	55.33	23.79	60.22
31	307.41	0.68	19.55	1.19	9.74	6.84	15.51	1.60	56.51	58.03	24.38	62.94
34	222.59	1.15	18.56	1.40	15.07	5.67	12.05	1.47	66.83	68.92	21.71	72.26
37	132.68	2.54	12.41	1.02	16.14	9.35	18.30	2.37	73.28	75.62	22.40	78.87
40	44.47	3.83	6.56	2.22	21.02	24.49	30.23	3.76	76.06	79.39	38.93	88.42
43	-25.63	4.79	5.26	2.46	30.98	30.38	36.69	3.74	78.05	84.54	47.37	96.91
46	-46.85	4.40	3.48	1.54	31.58	23.34	28.14	2.55	66.76	74.26	36.28	82.65
49	-38.62	2.99	1.66	0.78	24.20	14.55	16.53	1.50	46.68	52.83	21.75	57.13

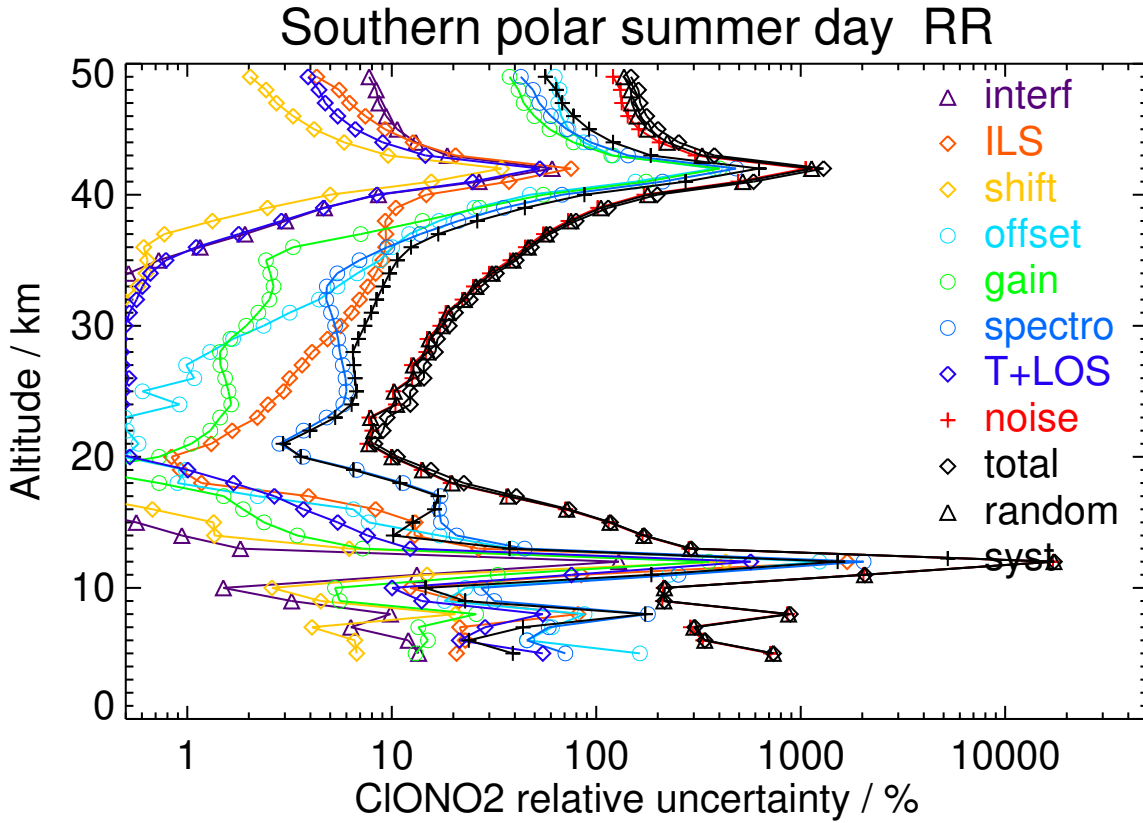


Figure S65: V8R_CLONO2_261 Southern polar summer day

Table S70: CIONO2 error budget for Southern polar summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-7.97	0.73	2.42	0.39	6.38	1.46	5.85	2.80	29.55	30.61	5.27	31.06
10	2.98	0.20	1.59	0.39	2.91	0.68	3.00	1.04	23.86	24.30	0.75	24.31
13	9.74	0.21	3.17	0.69	3.79	0.62	4.52	1.20	26.80	27.44	3.48	27.66
16	50.03	0.13	4.37	0.39	2.59	0.93	9.32	1.73	30.62	31.21	8.96	32.47
19	284.35	0.13	1.88	0.74	2.27	1.02	16.42	2.54	35.39	36.15	15.23	39.23
22	537.56	0.18	6.28	0.69	3.01	5.98	16.55	1.79	41.40	42.36	16.78	45.56
25	648.34	0.23	12.40	0.70	3.13	8.56	26.54	2.19	44.76	45.70	29.35	54.32
28	649.14	0.43	21.54	0.58	5.68	9.12	29.71	2.74	53.90	55.22	36.42	66.15
31	583.31	0.95	29.13	1.79	12.05	11.32	25.29	2.76	57.86	59.92	39.12	71.56
34	458.43	1.57	19.58	1.32	13.87	3.79	25.51	2.56	66.12	67.88	31.87	74.99
37	295.55	3.20	7.17	1.12	13.86	14.12	34.94	3.35	71.48	73.27	37.77	82.43
40	157.79	3.96	3.73	1.83	23.09	24.54	41.31	3.67	76.15	80.08	47.69	93.20
43	78.43	5.03	3.33	1.73	33.02	27.30	40.80	3.13	79.59	86.65	48.75	99.42
46	29.51	4.39	2.02	1.00	32.33	19.77	27.34	2.02	67.06	74.79	33.39	81.91
49	2.07	2.99	0.95	0.52	24.19	12.65	15.61	1.23	46.41	52.52	19.90	56.16

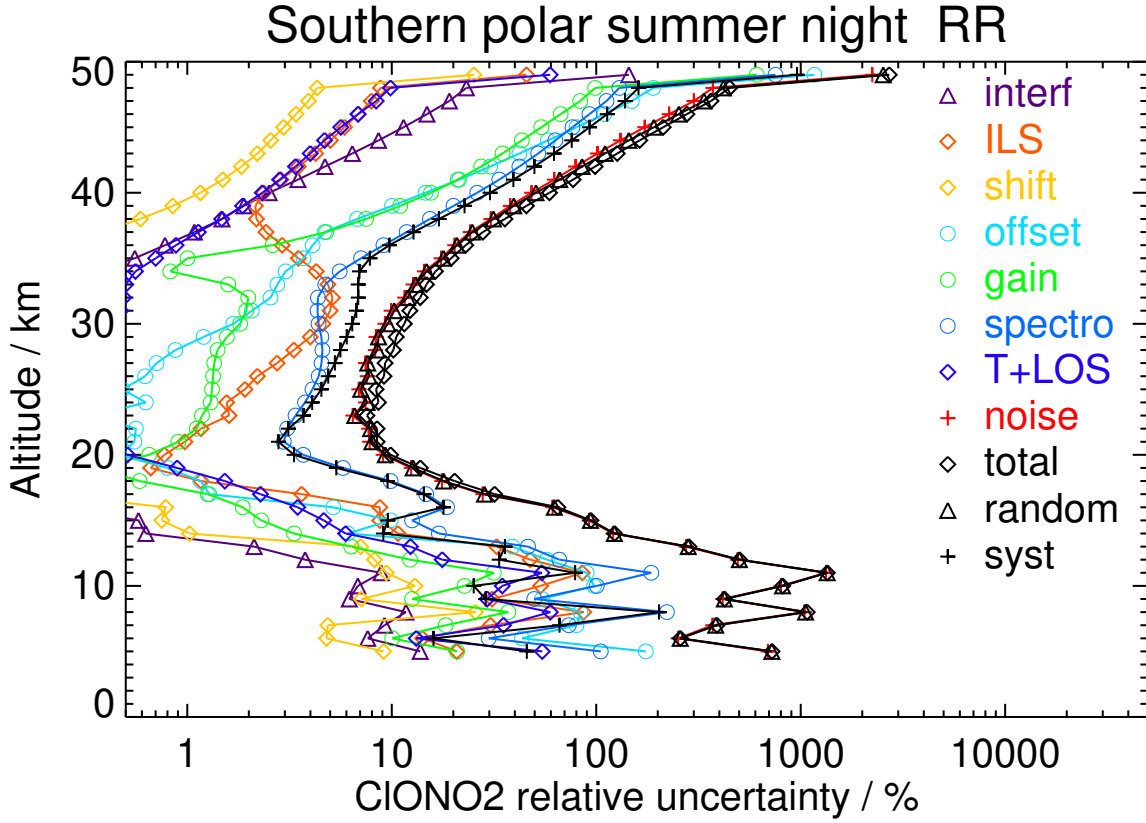


Figure S66: V8R_CLONO2.261 Southern polar summer night

Table S71: CLONO2 error budget for Southern polar autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	-12.97	0.27	1.52	0.34	6.53	1.15	4.23	2.48	28.83	29.91	2.61	30.03
10	6.75	0.11	1.66	0.26	2.38	0.96	4.31	1.17	25.64	26.20	0.62	26.21
13	35.52	0.11	3.79	0.61	3.35	1.25	7.82	1.49	28.06	29.01	6.04	29.64
16	195.82	0.07	3.86	0.40	2.51	1.74	17.41	2.85	32.85	34.15	15.76	37.61
19	454.56	0.08	5.83	1.11	2.50	4.27	19.91	2.52	39.12	42.81	12.65	44.64
22	588.96	0.08	8.64	0.49	2.98	6.77	25.99	2.47	45.53	46.49	26.88	53.70
25	589.27	0.17	10.11	0.67	3.77	7.50	31.03	2.63	51.85	53.04	31.91	61.89
28	624.05	0.52	12.36	0.68	7.49	7.31	31.40	2.77	62.45	64.03	32.51	71.81
31	618.98	0.90	15.80	0.80	14.76	6.92	32.96	3.14	69.29	71.76	35.55	80.09
34	556.92	0.64	16.54	0.84	23.15	4.07	33.59	3.28	81.15	84.84	36.80	92.47
37	443.73	3.07	14.17	0.99	32.55	3.32	33.79	3.24	96.07	101.80	36.08	108.00
40	292.45	4.80	9.98	1.03	41.46	7.55	28.94	2.84	104.67	112.94	30.75	117.05
43	156.20	4.43	5.23	0.80	42.60	9.00	18.93	2.24	93.97	103.46	20.82	105.53
46	33.77	3.06	1.50	0.43	32.35	8.17	10.30	1.76	65.13	72.94	12.51	74.00

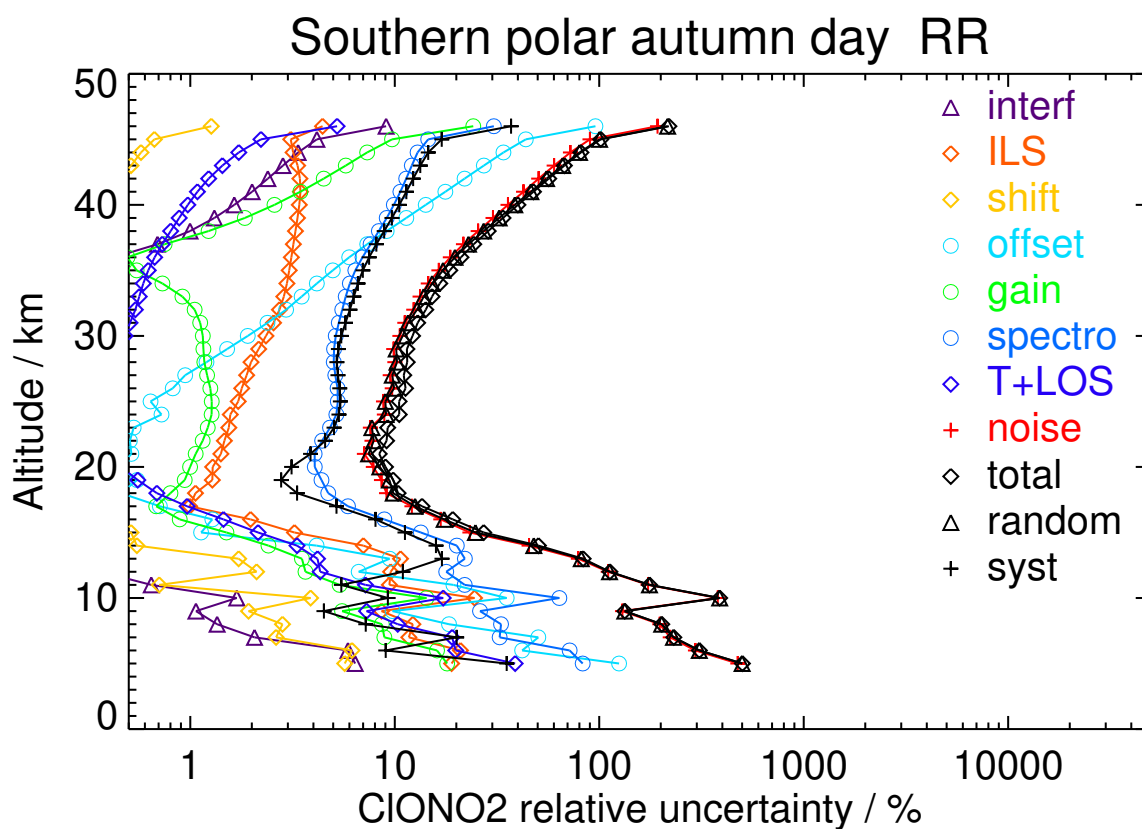


Figure S67: V8R-CLONO2_261 Southern polar autumn day

Table S72: CLONO2 error budget for Southern polar autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
7	7.54	0.31	1.45	0.31	5.60	1.17	4.71	2.07	28.04	29.05	1.92	29.12
10	14.65	0.13	1.52	0.19	2.73	1.16	3.31	1.00	25.37	25.82	0.70	25.83
13	29.37	0.14	3.81	0.57	3.03	1.48	9.35	1.70	28.08	29.04	7.84	30.08
16	265.38	0.07	5.66	0.62	2.47	1.82	25.01	4.22	33.64	34.90	24.48	42.63
19	581.23	0.09	8.26	1.01	2.51	6.67	22.74	2.57	40.12	42.92	20.28	47.47
22	566.57	0.13	10.96	0.54	3.05	8.22	35.53	3.62	46.48	48.19	36.21	60.27
25	491.26	0.30	10.13	0.73	4.05	7.04	27.18	2.67	53.33	54.81	27.47	61.31
28	541.83	0.68	10.65	0.68	8.19	6.24	25.53	2.27	63.73	65.55	25.34	70.28
31	632.31	0.97	13.56	0.71	15.90	6.23	28.09	2.54	71.01	73.48	30.25	79.47
34	644.01	0.90	14.85	0.82	24.23	3.55	33.02	3.04	83.17	87.11	35.37	94.01
37	538.56	3.18	13.15	0.95	33.79	3.74	35.27	3.26	97.68	103.81	36.87	110.16
40	375.43	4.69	9.33	0.94	42.62	7.94	30.49	2.92	105.84	114.47	32.01	118.86
43	213.92	4.31	4.79	0.71	43.27	9.33	20.28	2.35	94.44	104.14	22.19	106.47
46	58.53	3.07	1.24	0.33	32.96	8.66	10.70	1.83	65.26	73.28	13.36	74.49

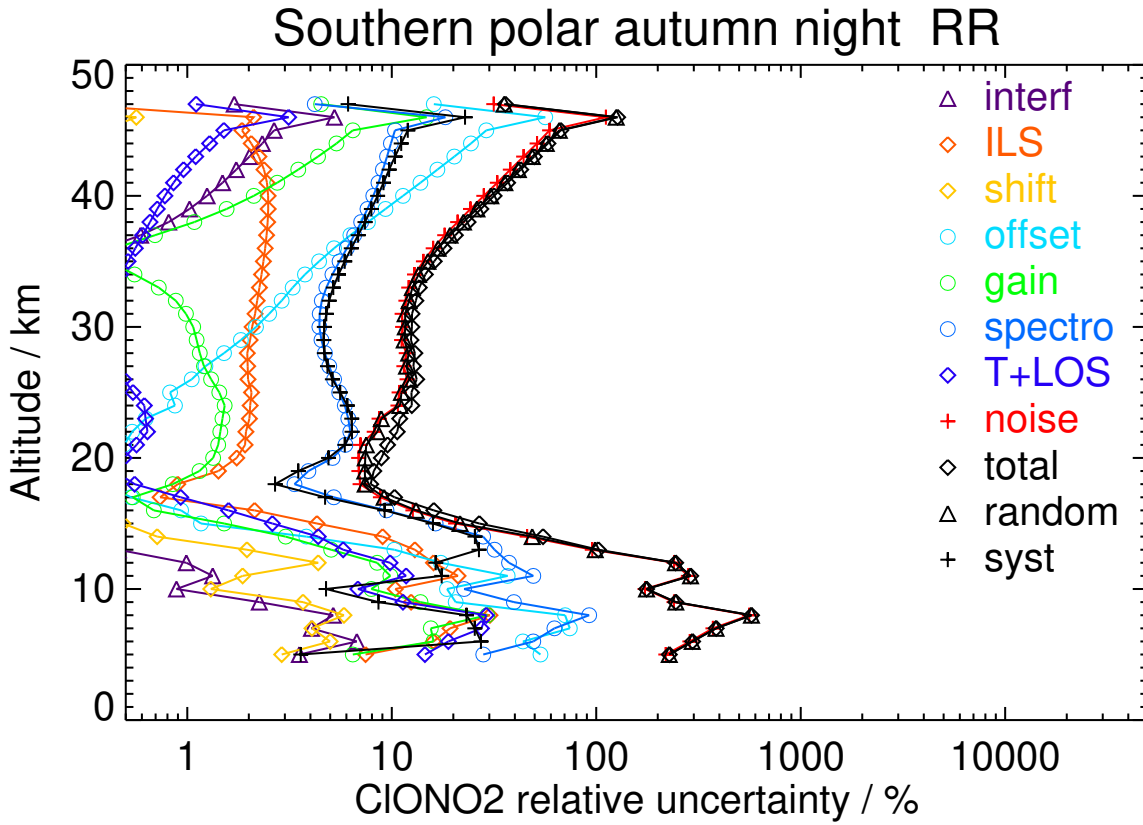


Figure S68: V8R.CLONO2.261 Southern polar autumn night

Table S73: CIONO2 error budget for Northern polar winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
16	828.47	0.23	10.14	0.81	9.96	21.80	67.59	6.33	33.96	63.24	49.39	80.24
19	771.47	0.15	10.00	1.19	10.92	14.11	51.63	5.19	40.77	57.45	38.40	69.10
22	832.78	0.08	13.90	1.04	11.05	11.88	45.07	4.24	47.50	58.37	36.82	69.01
25	790.61	0.10	13.21	0.78	10.03	9.57	40.13	3.48	53.55	55.48	42.18	69.69
28	716.74	0.35	14.39	0.70	9.58	9.49	37.33	3.16	60.53	61.89	40.33	73.87
31	675.25	0.71	15.35	0.80	12.83	8.69	35.49	2.95	68.73	70.34	39.02	80.43
34	612.13	0.73	13.31	0.62	19.86	5.13	38.98	3.15	78.01	81.07	40.53	90.63
37	502.45	2.61	9.49	0.40	31.36	4.73	40.36	3.40	91.21	96.83	41.07	105.18
40	359.75	4.25	6.71	0.49	41.85	7.72	36.04	3.18	101.55	110.12	36.99	116.17
43	205.70	4.19	4.33	0.44	41.91	7.61	26.03	2.37	90.47	99.93	27.10	103.53
46	40.88	3.29	1.71	0.42	31.62	7.91	14.70	1.68	62.78	70.41	16.69	72.37

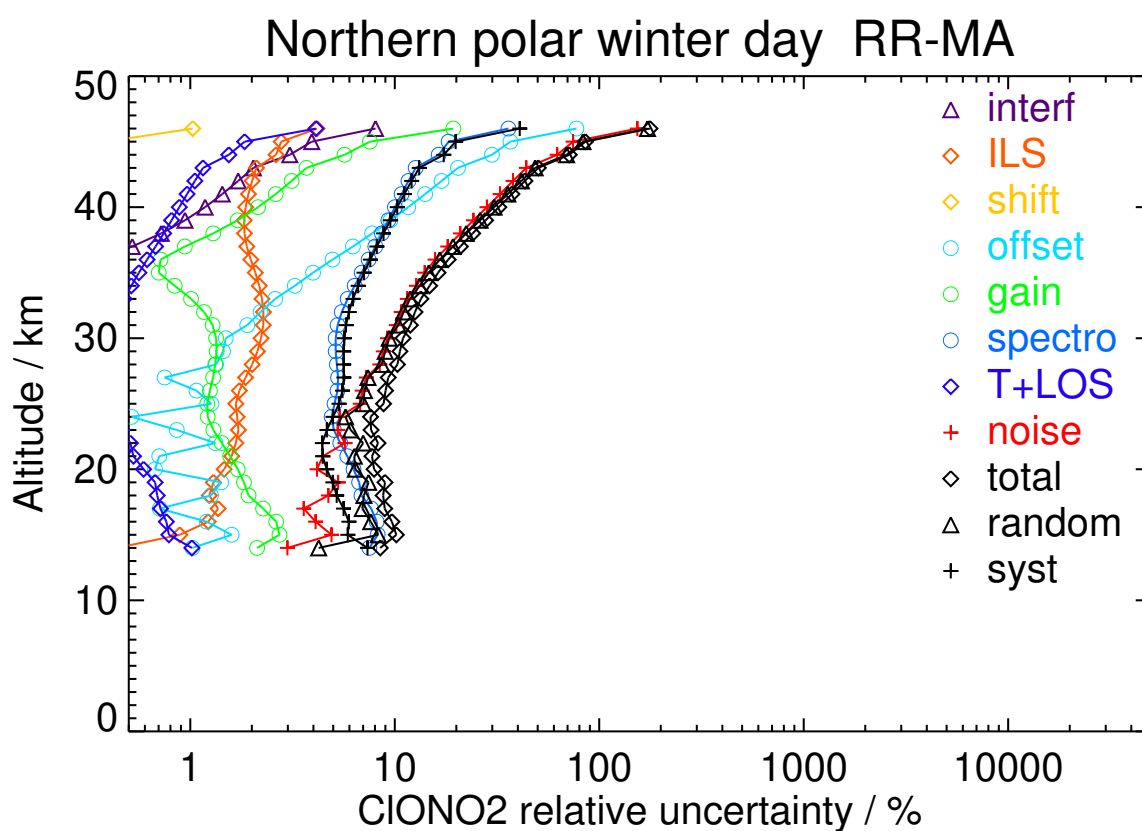


Figure S69: V8R_CLONO2_561 Northern polar winter day

Table S74: CLONO2 error budget for Northern polar winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
16	833.53	0.28	6.80	0.92	10.23	20.72	77.75	8.17	34.79	78.24	42.21	88.90
19	493.60	0.08	7.88	0.80	10.70	8.58	34.40	4.11	42.96	54.61	17.73	57.42
22	707.43	0.11	6.85	0.84	11.49	7.05	30.37	4.62	54.13	60.84	20.05	64.05
25	1129.74	0.30	12.63	0.71	9.56	9.75	40.28	4.71	61.23	63.69	41.02	75.76
28	1172.13	0.74	21.73	1.09	11.80	12.11	62.28	6.85	69.23	73.49	63.86	97.35
31	1011.35	1.00	23.89	1.01	18.31	10.70	65.33	7.35	77.89	82.50	67.87	106.82
34	786.35	0.72	20.27	0.59	26.58	5.39	59.87	6.47	87.36	92.23	62.45	111.38
37	554.62	3.50	14.68	0.54	36.92	4.72	52.84	5.19	99.77	106.82	54.54	119.94
40	352.18	5.82	9.63	0.68	45.70	9.06	42.90	4.04	106.38	116.18	44.41	124.38
43	191.50	5.81	5.21	0.56	45.37	10.02	29.39	2.95	93.23	104.04	30.97	108.56
46	8.47	6.10	1.51	0.41	37.77	10.49	13.99	2.33	66.35	76.67	17.33	78.61

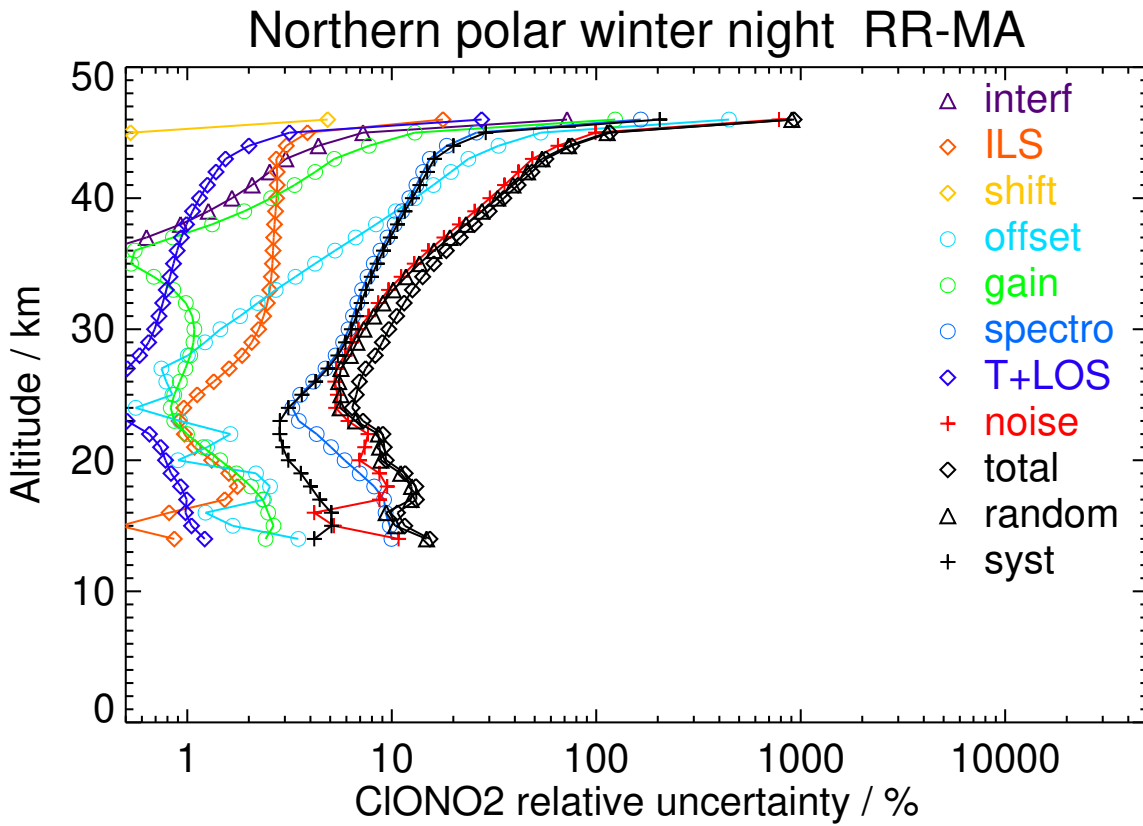


Figure S70: V8R_CLONO2_561 Northern polar winter night

Table S75: CLONO2 error budget for Northern polar spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	765.54	0.14	7.97	0.88	8.06	8.40	27.98	3.07	37.47	40.29	27.79	48.95
22	910.52	0.16	11.97	0.74	10.87	10.32	39.93	4.43	51.23	53.40	41.90	67.88
25	813.07	0.26	15.64	0.66	9.88	10.17	48.77	5.12	57.34	58.75	51.85	78.35
28	603.53	0.72	18.54	0.97	9.79	9.13	42.31	4.58	63.90	65.34	46.36	80.12
31	425.29	1.46	19.93	1.37	14.69	8.22	30.01	3.68	71.91	74.00	35.97	82.28
34	255.46	1.06	17.49	0.84	19.82	4.21	21.85	2.43	79.92	82.68	27.43	87.11
37	128.12	3.74	10.10	0.79	24.15	8.20	23.99	2.67	86.34	89.92	26.80	93.83
40	54.53	6.87	6.30	1.90	32.78	18.16	29.32	3.80	90.79	97.20	34.11	103.01
43	31.09	7.32	4.89	1.84	40.11	20.85	28.69	3.86	88.25	97.72	34.66	103.68
46	12.71	5.15	3.20	1.10	35.34	15.39	19.17	2.81	67.52	76.72	23.90	80.36

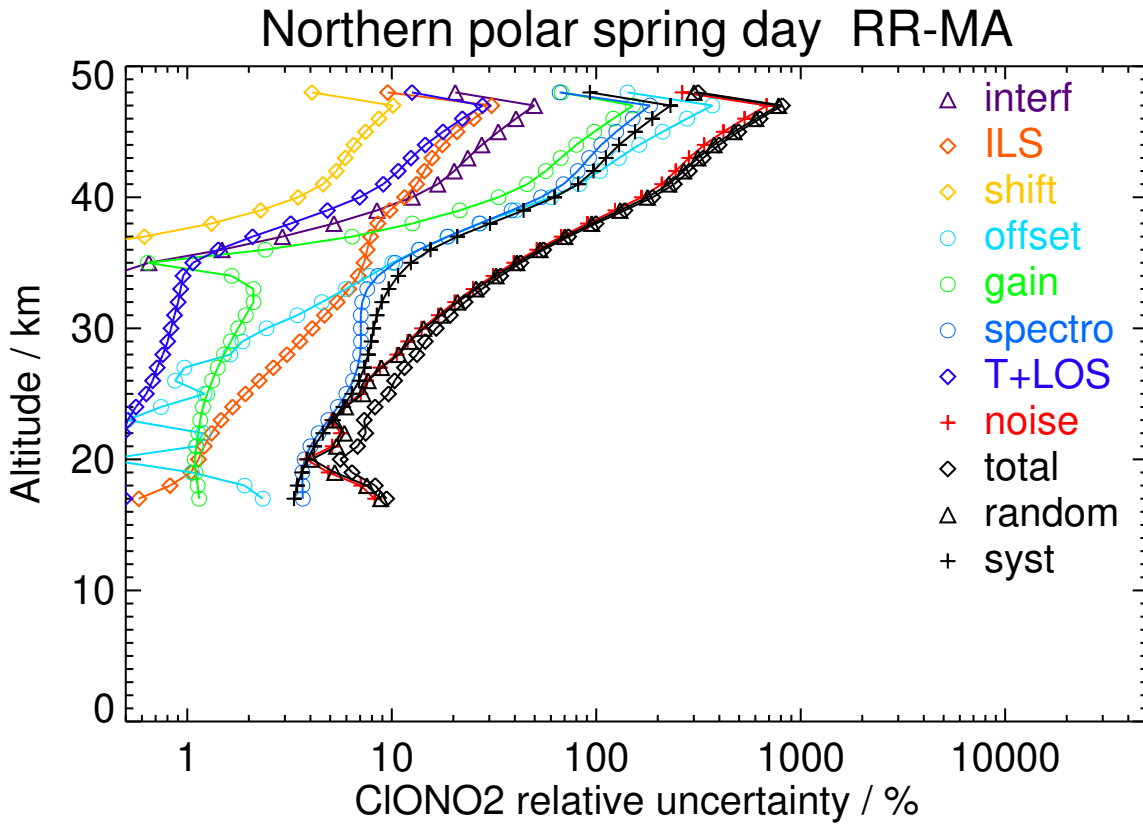


Figure S71: V8R.CLONO2.561 Northern polar spring day

Table S76: CLONO2 error budget for Northern polar spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	690.50	0.16	6.75	0.85	8.35	7.42	23.93	2.95	37.80	41.45	21.52	46.71
22	940.80	0.22	10.55	0.84	11.03	9.50	35.36	3.89	51.50	54.36	35.87	65.13
25	961.94	0.37	15.07	0.65	9.85	11.24	46.42	4.72	57.45	58.99	49.48	76.99
28	900.21	0.82	20.37	1.01	9.63	11.61	48.15	4.97	63.96	65.23	53.13	84.13
31	791.86	1.60	24.60	1.82	14.44	11.43	44.33	5.06	71.37	73.41	51.44	89.64
34	561.32	1.26	22.90	1.42	19.07	7.02	38.83	4.25	78.52	81.18	45.20	92.91
37	297.13	3.59	14.01	0.40	23.25	7.27	38.18	3.60	84.69	88.14	40.94	97.19
40	117.60	7.01	7.95	1.79	32.25	18.19	37.89	4.15	89.93	96.23	42.02	105.01
43	43.52	7.76	5.00	1.95	39.83	21.44	33.06	4.13	88.25	97.59	38.85	105.04
46	15.61	5.56	2.89	1.24	34.92	15.98	21.32	3.01	67.45	76.47	26.13	80.81

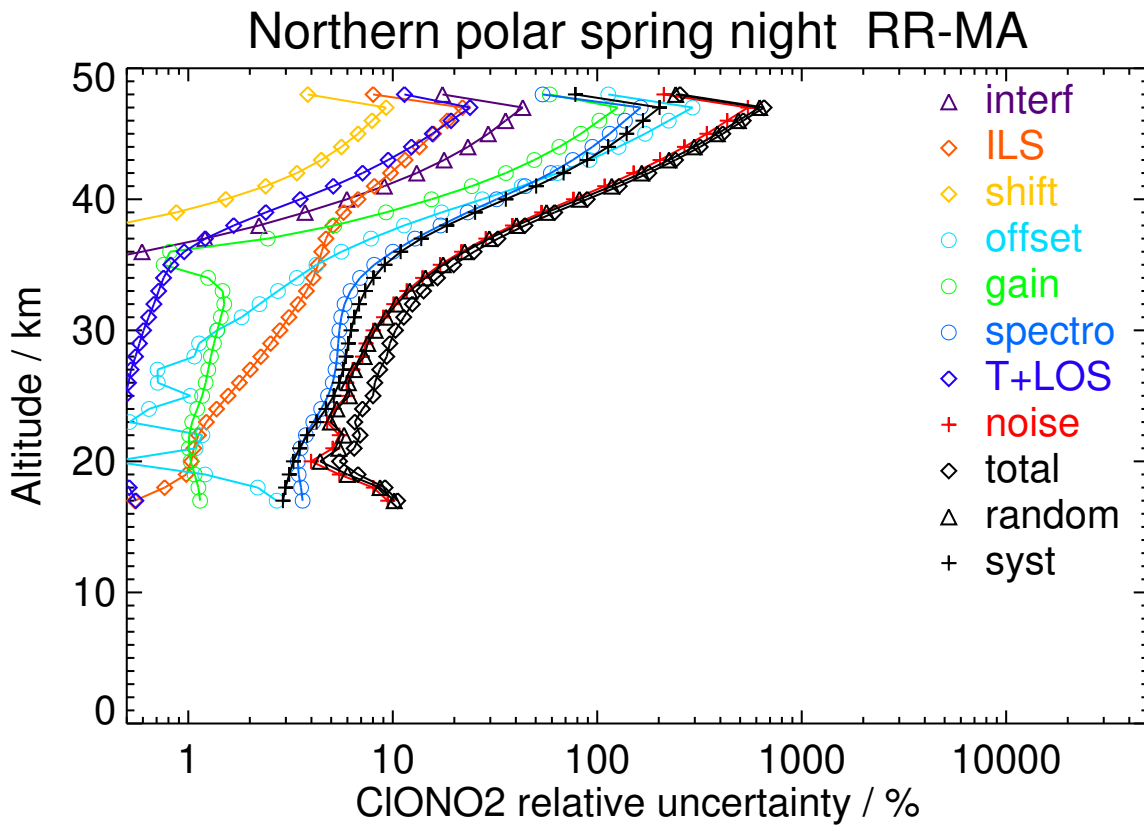


Figure S72: V8R.CLONO2_561 Northern polar spring night

Table S77: CLONO2 error budget for Northern polar summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	174.38	0.10	3.56	0.31	6.09	1.57	7.86	1.35	29.20	30.48	6.29	31.12
22	336.24	0.16	4.55	0.52	9.55	3.00	9.88	1.13	44.38	45.73	9.94	46.80
25	409.51	0.20	7.90	0.40	9.89	5.72	15.27	1.35	51.72	53.05	17.01	55.71
28	481.34	0.44	13.96	0.40	9.44	7.07	19.55	1.70	57.63	58.84	24.05	63.56
31	451.92	1.32	22.01	1.09	11.72	8.89	20.44	2.15	63.56	64.97	30.74	71.88
34	311.53	1.65	21.62	1.04	14.86	7.04	18.06	1.93	70.55	72.33	28.58	77.77
37	154.35	3.51	9.06	0.90	14.91	7.94	24.21	2.94	73.62	75.39	26.67	79.97
40	55.59	5.86	2.48	2.38	18.72	19.87	30.16	4.06	74.84	77.66	35.86	85.54
43	19.38	7.28	1.62	2.63	28.64	24.25	32.07	4.14	77.31	83.09	39.86	92.16
46	15.45	5.62	1.25	1.78	31.03	18.86	23.96	3.06	66.41	73.73	30.22	79.68
49	11.56	3.42	0.74	0.97	25.61	11.83	14.45	1.98	48.02	54.64	18.50	57.69

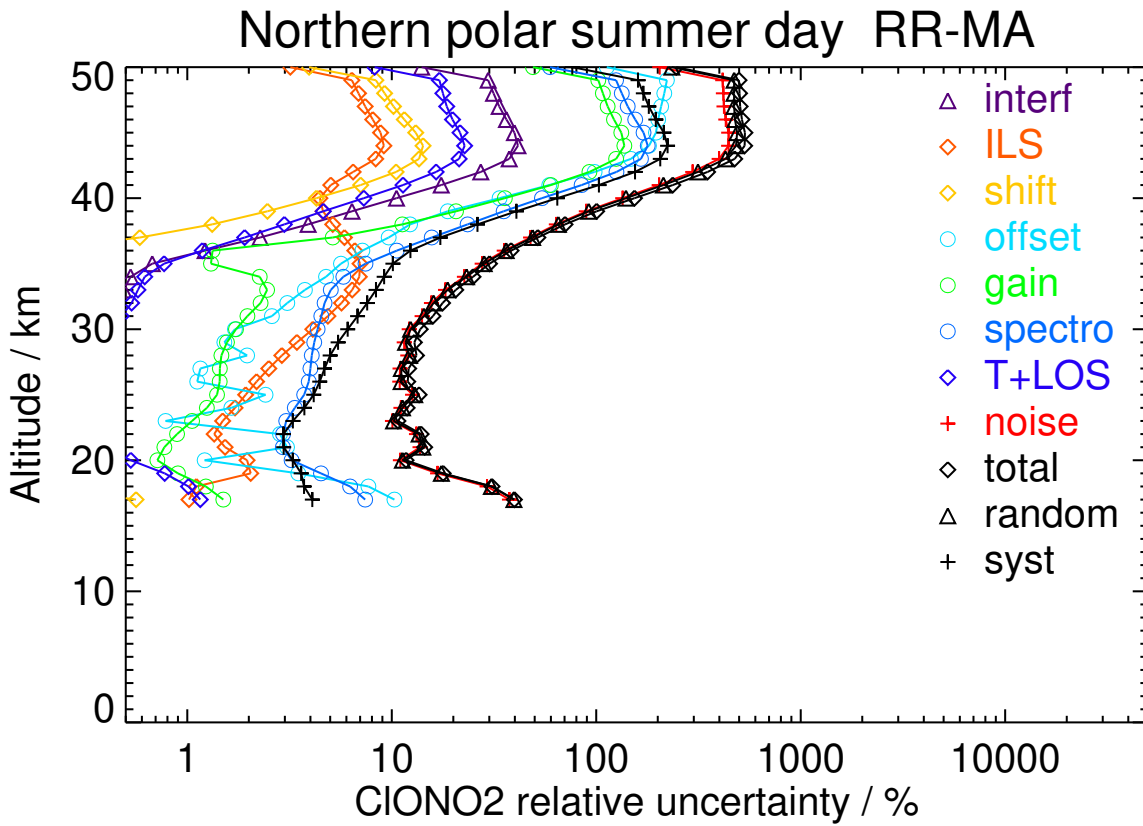


Figure S73: V8R_CLONO2_561 Northern polar summer day

Table S78: CIONO2 error budget for Northern polar summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	238.00	0.12	3.23	0.47	7.19	1.59	11.34	1.83	30.95	32.92	8.43	33.99
22	484.92	0.20	4.54	0.64	10.66	3.30	14.47	1.86	46.29	48.28	13.04	50.01
25	653.59	0.29	8.10	0.67	10.46	6.64	22.12	2.17	53.07	54.60	23.44	59.42
28	758.15	0.54	15.19	0.45	9.65	9.13	30.36	2.64	58.72	60.35	33.80	69.17
31	752.14	1.27	24.12	1.38	12.12	11.05	34.06	3.38	64.79	66.75	42.05	78.89
34	601.63	1.29	24.38	1.62	15.88	8.44	33.99	3.34	72.89	75.06	42.04	86.03
37	365.72	3.32	13.18	0.26	17.88	5.85	39.45	3.61	78.15	80.48	41.70	90.64
40	184.88	5.83	5.66	1.27	25.02	15.07	41.58	3.83	81.42	85.60	44.34	96.40
43	61.01	6.07	2.96	1.53	34.56	17.35	34.87	3.31	82.90	90.23	38.76	98.20
46	4.40	4.46	1.38	0.98	33.12	12.70	20.18	2.27	67.47	75.42	23.62	79.03
49	7.33	3.02	0.39	0.55	25.30	8.69	10.23	1.67	46.76	53.32	13.26	54.94

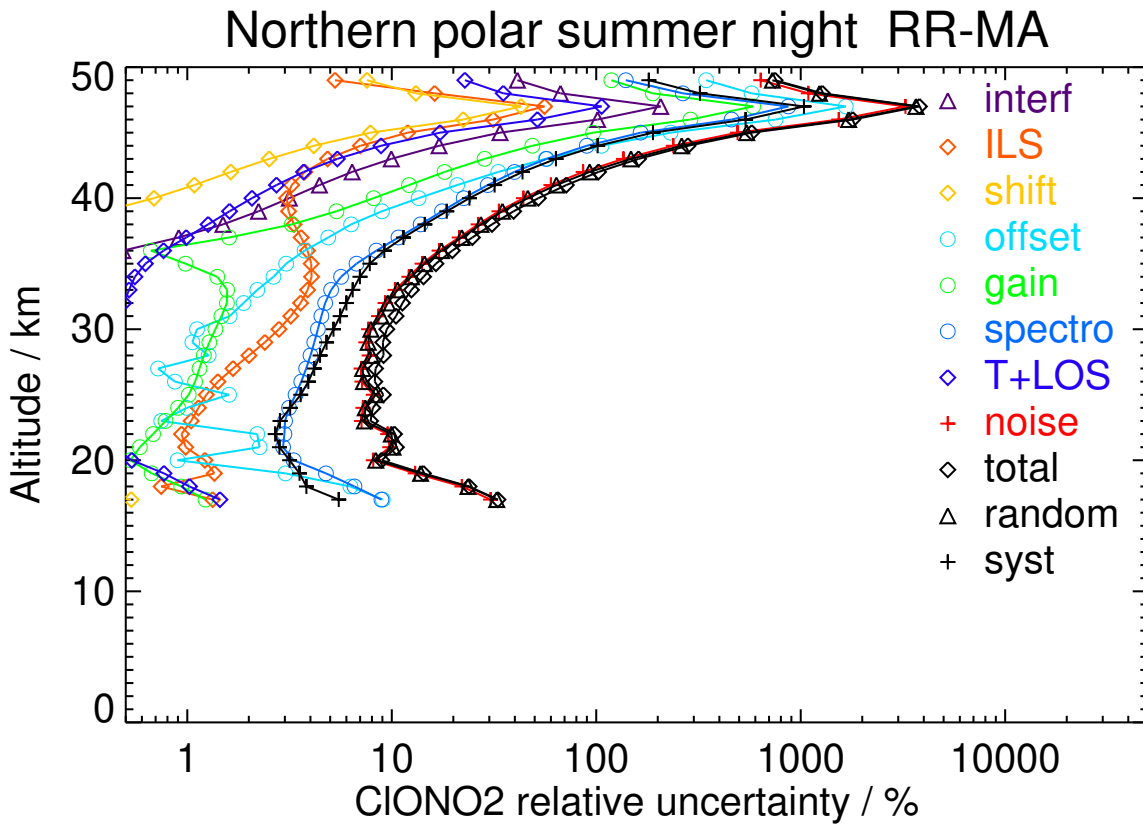


Figure S74: V8R_CLONO2_561 Northern polar summer night

Table S79: CLONO2 error budget for Northern polar autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	373.51	0.09	4.57	0.61	8.74	3.73	14.84	1.87	36.55	39.37	11.02	40.88
22	559.56	0.11	6.55	0.66	11.43	4.86	18.45	2.20	50.78	52.94	17.86	55.87
25	670.54	0.19	9.32	0.57	9.97	6.94	26.56	2.56	57.26	58.63	28.08	65.00
28	691.07	0.56	13.42	0.59	9.52	8.35	34.16	3.13	63.99	65.51	36.33	74.91
31	655.69	1.12	16.66	0.90	14.02	8.29	36.62	3.53	71.96	74.04	39.93	84.12
34	522.52	0.61	16.84	0.79	20.11	5.47	35.77	3.38	80.42	83.36	39.08	92.07
37	339.46	3.23	12.35	0.30	27.72	3.49	33.71	3.18	90.12	94.64	35.42	101.05
40	191.31	5.55	7.58	0.52	37.65	9.07	26.93	2.96	98.10	105.47	28.68	109.30
43	86.83	5.49	3.46	0.55	42.01	10.84	17.14	2.65	91.85	101.37	19.67	103.26
46	33.75	3.87	0.82	0.36	33.76	8.62	8.69	2.14	65.59	74.04	11.38	74.91

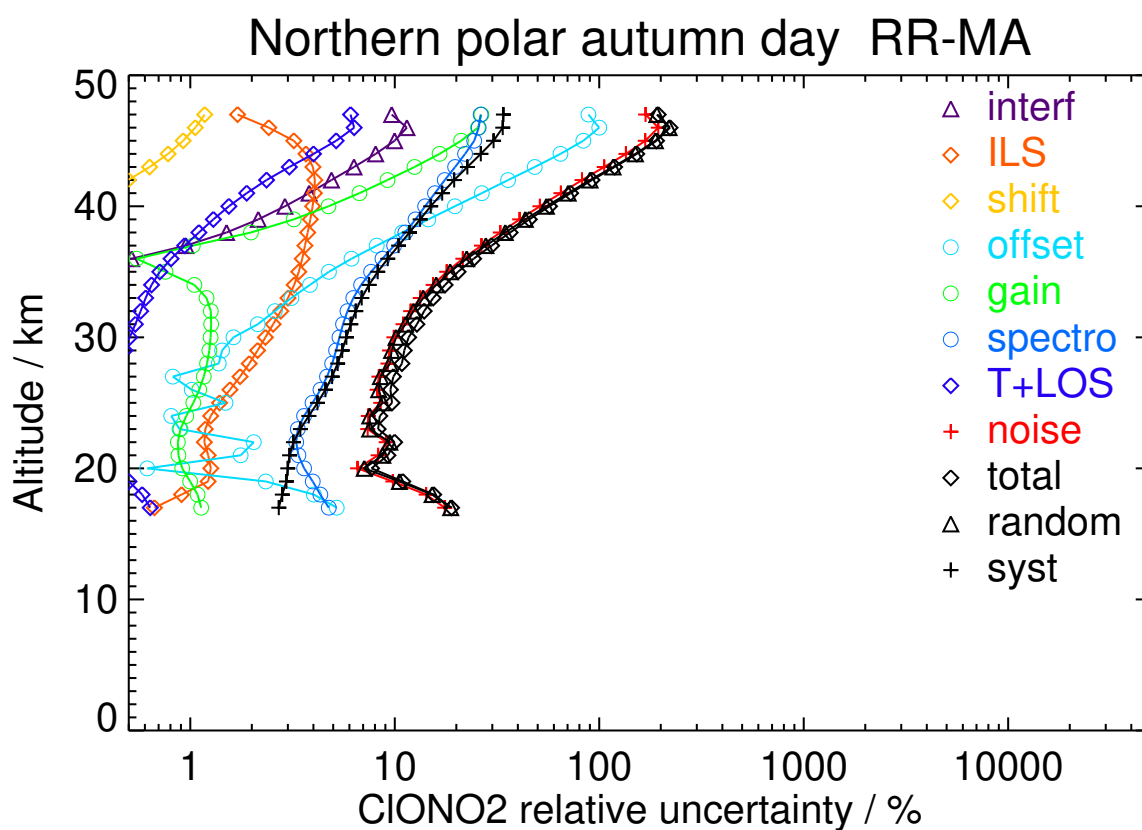


Figure S75: V8R-CLONO2_561 Northern polar autumn day

Table S80: CLONO2 error budget for Northern polar autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	450.41	0.11	5.49	0.60	9.74	4.85	18.66	2.00	39.25	42.21	16.12	45.18
22	562.29	0.14	7.74	0.64	11.91	6.12	23.42	2.45	51.90	53.94	24.05	59.06
25	579.90	0.28	9.15	0.54	10.06	6.86	26.89	2.55	58.00	59.34	28.35	65.77
28	628.79	0.67	11.14	0.54	9.43	7.31	28.23	2.59	65.19	66.45	30.07	72.94
31	720.46	1.17	14.16	0.58	14.74	7.75	32.98	3.07	74.03	75.97	35.86	84.01
34	681.59	0.66	15.54	0.52	22.02	5.68	37.92	3.43	83.60	86.83	40.74	95.91
37	507.50	3.04	13.01	0.34	30.61	2.60	39.45	3.61	94.46	99.69	40.96	107.77
40	305.68	5.66	9.02	0.38	39.99	6.66	32.68	3.24	101.86	109.86	33.79	114.94
43	144.58	5.97	4.75	0.34	43.03	8.53	20.68	2.74	93.07	102.90	22.17	105.26
46	28.57	4.26	1.45	0.21	34.11	7.23	9.36	2.17	65.56	74.13	11.45	75.01

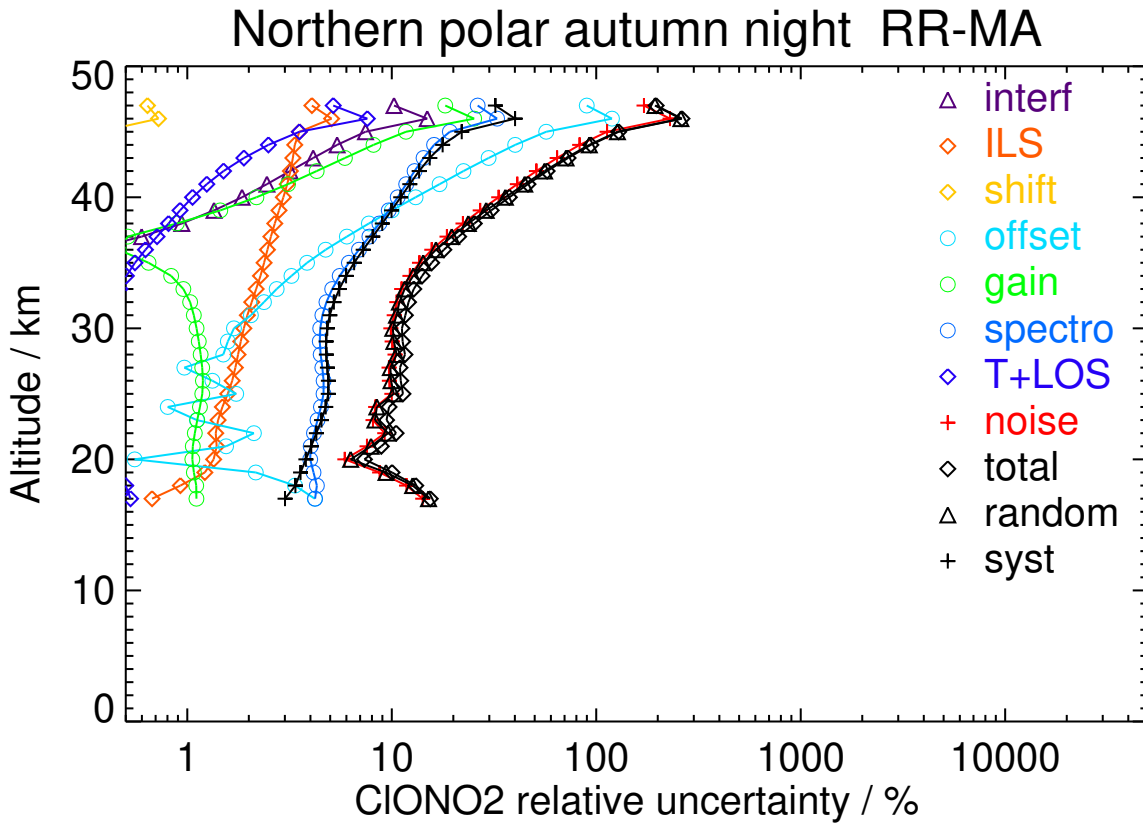


Figure S76: V8R.CLONO2.561 Northern polar autumn night

Table S81: CIONO2 error budget for Northern midlatitude winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
16	189.08	0.09	2.11	0.22	9.62	4.39	23.81	2.94	32.15	40.80	7.80	41.54
19	465.04	0.11	3.05	0.83	11.28	3.72	22.50	3.09	42.03	46.20	17.31	49.33
22	810.66	0.13	7.66	0.81	10.72	9.52	30.79	3.12	48.97	54.21	26.12	60.18
25	865.27	0.20	13.52	0.70	9.35	10.66	43.96	3.87	55.10	57.59	45.29	73.26
28	724.44	0.67	19.36	0.83	10.04	10.44	43.76	4.21	60.97	62.71	47.98	78.96
31	552.85	1.28	20.47	1.22	13.53	9.72	35.60	3.64	68.53	70.43	41.43	81.71
34	389.91	1.15	13.13	0.52	16.01	3.38	33.88	3.11	74.66	76.74	35.86	84.70
37	254.40	3.50	6.96	0.59	23.60	9.90	31.68	3.00	81.46	85.10	33.50	91.46
40	169.57	6.04	3.97	1.10	36.23	16.80	28.58	3.47	91.55	98.90	32.82	104.20
43	109.41	6.84	2.44	1.08	42.01	18.79	24.91	3.58	89.39	99.30	30.56	103.90
46	61.76	5.02	1.57	0.70	34.72	14.02	17.46	2.62	65.85	74.85	21.79	77.96

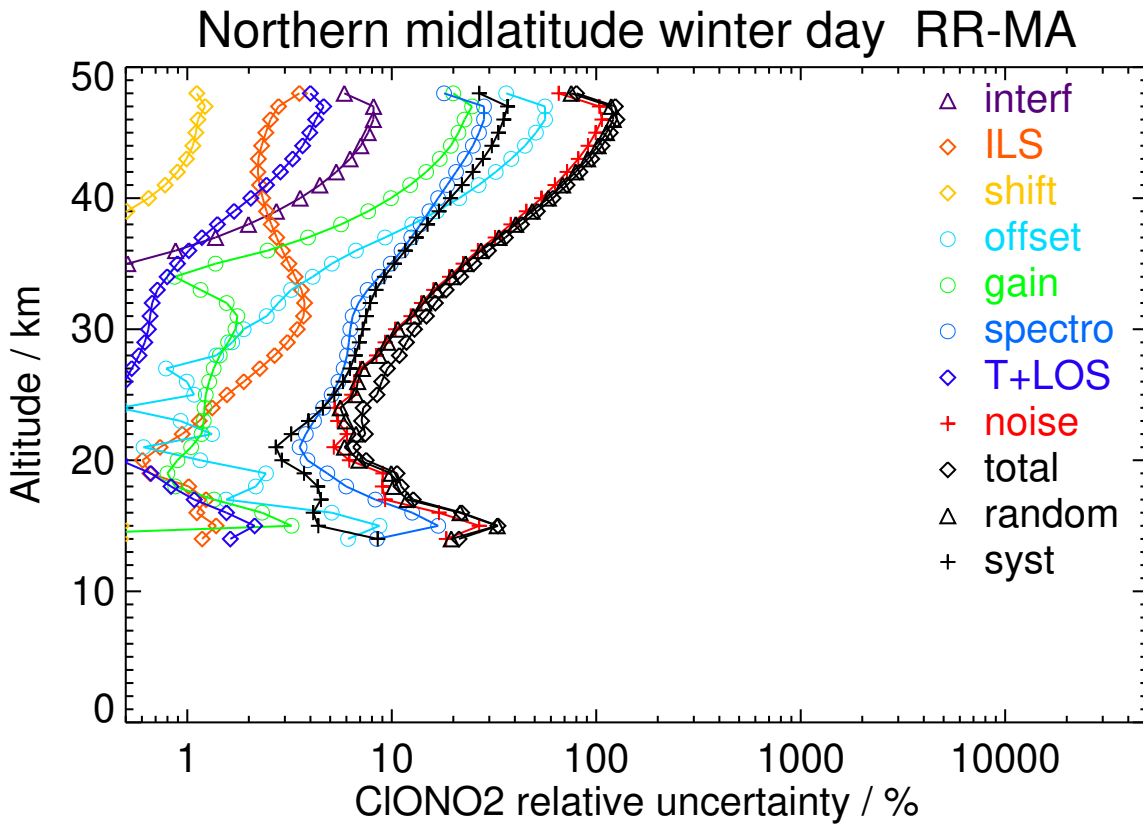


Figure S77: V8R_CLONO2_561 Northern midlatitude winter day

Table S82: CIONO2 error budget for Northern midlatitude winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
16	485.03	0.22	3.09	0.55	13.72	9.25	37.24	4.09	44.22	58.83	13.47	60.35
19	620.51	0.09	6.79	1.11	7.96	8.00	31.96	3.56	35.01	46.23	17.24	49.34
22	872.45	0.13	9.41	0.86	6.70	9.78	34.67	3.21	43.47	48.93	30.63	57.73
25	936.18	0.21	14.47	0.81	6.66	10.72	43.75	3.95	51.70	53.32	46.13	70.51
28	875.04	0.54	20.64	0.97	8.36	11.11	45.92	4.28	59.06	60.28	51.01	78.97
31	771.85	1.10	24.59	1.55	13.44	12.26	42.56	4.33	67.91	69.89	49.97	85.91
34	615.39	1.02	19.41	0.98	17.03	6.38	41.99	3.90	75.26	77.59	46.18	90.29
37	428.48	2.76	10.12	0.47	23.12	9.22	42.66	3.63	81.79	85.36	44.33	96.19
40	239.92	4.75	4.87	1.29	34.73	18.91	38.57	3.84	89.93	96.96	42.42	105.84
43	102.66	5.77	2.88	1.39	41.39	22.28	32.01	4.01	88.81	98.64	38.10	105.74
46	29.73	4.63	2.04	0.91	34.77	16.79	21.45	3.01	66.52	75.53	26.57	80.07

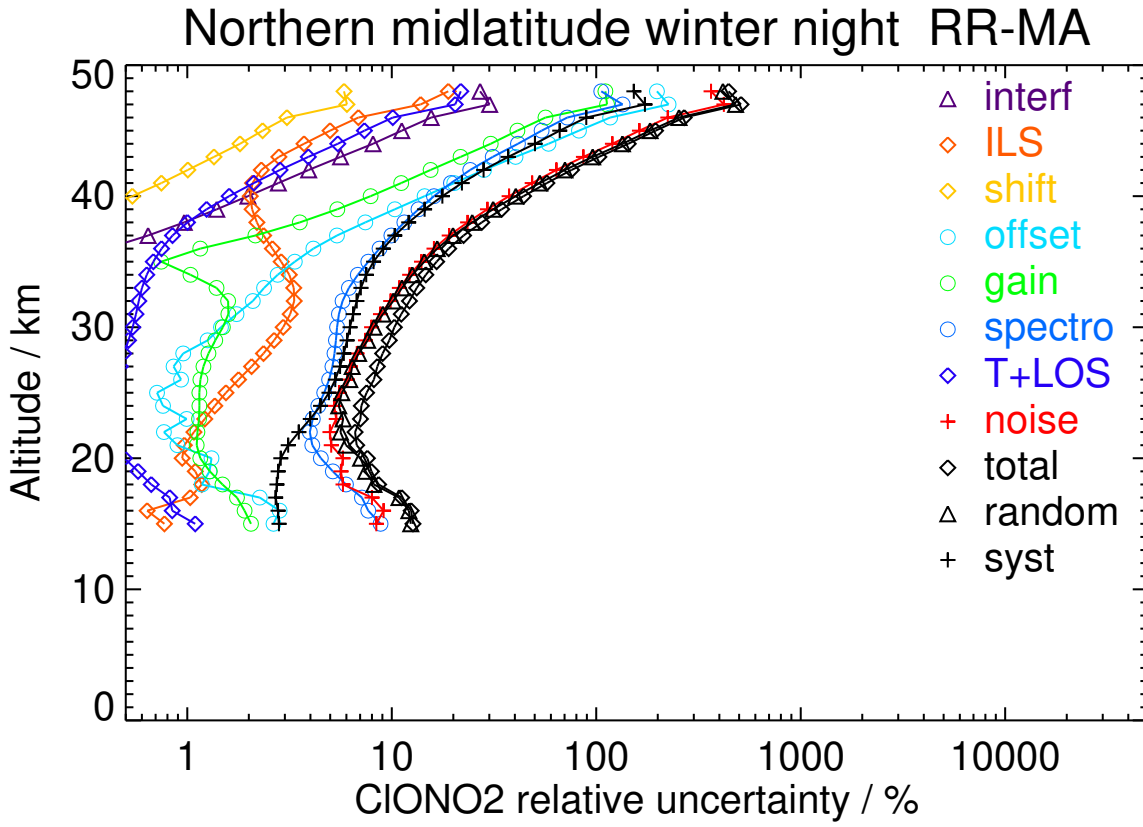


Figure S78: V8R_CLONO2_561 Northern midlatitude winter night

Table S83: CIONO2 error budget for Northern midlatitude spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	300.02	0.10	2.24	0.48	7.35	2.60	16.88	2.92	33.86	36.20	13.99	38.81
22	709.26	0.15	5.27	0.79	10.61	5.61	19.82	2.82	49.46	51.69	18.65	54.96
25	877.68	0.20	13.15	0.67	9.50	9.25	37.77	3.75	55.14	56.60	40.33	69.50
28	773.30	0.48	22.82	0.96	8.96	9.94	45.32	4.59	60.35	61.47	51.36	80.11
31	546.92	1.15	28.02	1.89	12.81	10.48	37.68	4.38	66.51	68.16	47.76	83.23
34	305.12	1.11	23.66	1.36	16.22	6.60	27.35	3.06	73.75	75.74	36.46	84.06
37	150.78	2.93	10.48	0.58	18.70	8.55	24.97	2.64	78.78	81.20	28.03	85.90
40	81.72	5.01	2.22	1.93	27.46	21.22	24.91	4.18	83.24	88.17	32.10	93.84
43	61.46	6.15	2.96	1.99	36.42	26.11	23.58	4.97	84.65	92.82	34.51	99.02
46	52.37	5.17	3.27	1.24	33.40	20.43	17.58	4.04	67.33	75.67	26.53	80.19

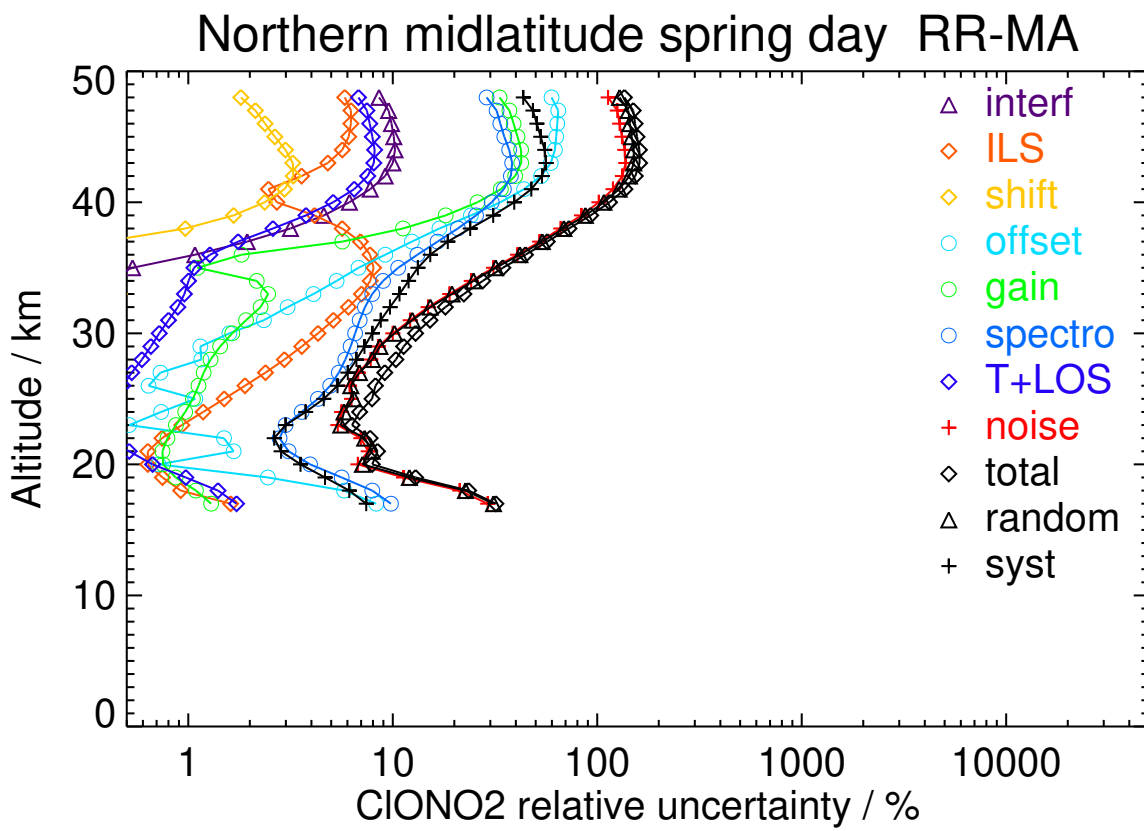


Figure S79: V8R_CLONO2_561 Northern midlatitude spring day

Table S84: CLONO2 error budget for Northern midlatitude spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	365.41	0.14	2.66	0.57	7.58	3.23	17.36	2.91	34.62	37.40	13.59	39.79
22	771.55	0.22	5.21	0.88	10.80	5.99	21.21	3.04	49.75	51.98	20.32	55.81
25	1007.65	0.33	12.82	0.80	9.87	10.53	38.28	3.76	55.97	57.47	41.03	70.61
28	1017.46	0.67	22.86	0.88	9.33	12.50	50.29	4.91	61.81	63.11	56.19	84.50
31	890.73	1.41	29.84	2.04	13.27	13.38	49.02	5.37	68.42	70.38	58.41	91.46
34	656.76	1.30	27.48	1.92	17.13	9.35	42.92	4.66	75.46	77.77	51.49	93.27
37	380.80	3.18	14.66	0.39	20.16	7.28	41.26	3.84	80.79	83.58	44.07	94.49
40	172.15	5.99	6.17	1.76	28.81	19.65	38.64	4.28	85.42	90.83	43.01	100.50
43	53.35	7.13	3.41	2.07	37.45	24.12	32.56	4.54	85.93	94.57	39.65	102.54
46	10.61	5.57	2.53	1.35	33.87	18.55	20.89	3.53	67.52	76.11	27.31	80.86

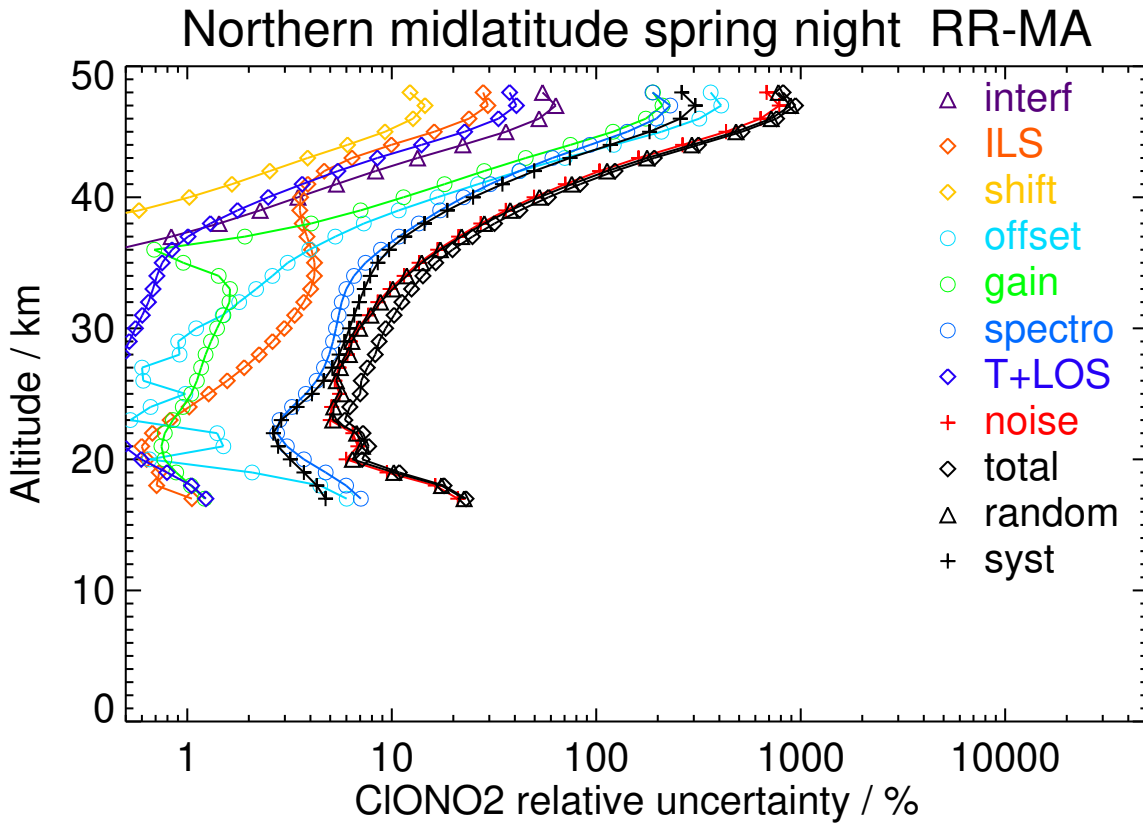


Figure S80: V8R_CLONO2_561 Northern midlatitude spring night

Table S85: CIONO2 error budget for Northern midlatitude summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	151.94	0.09	1.91	0.36	6.57	0.94	12.57	2.35	31.71	33.02	11.25	34.89
22	477.16	0.15	2.83	0.63	9.79	2.57	15.66	2.53	47.47	48.93	14.89	51.14
25	739.00	0.19	9.42	0.68	9.27	7.97	23.94	2.33	53.46	54.63	26.29	60.62
28	784.97	0.42	21.36	0.59	8.79	10.86	37.77	3.55	58.76	59.88	44.25	74.46
31	588.07	1.14	29.88	1.69	11.84	11.53	35.72	3.98	64.78	66.19	47.73	81.60
34	338.81	1.32	25.39	1.42	15.01	7.56	26.82	2.95	71.86	73.62	37.43	82.59
37	171.46	3.14	10.41	0.52	15.81	7.74	27.76	2.92	75.56	77.44	30.35	83.17
40	75.61	5.02	1.91	1.87	22.03	19.35	30.29	3.81	77.74	81.27	35.53	88.70
43	42.02	6.30	1.66	2.04	31.81	23.53	28.70	4.03	80.21	86.83	36.69	94.27
46	32.19	5.36	2.30	1.30	31.88	18.45	19.83	3.25	67.09	74.72	26.73	79.36
49	10.23	3.54	1.42	0.73	24.96	11.77	12.16	2.18	47.19	53.64	16.70	56.18

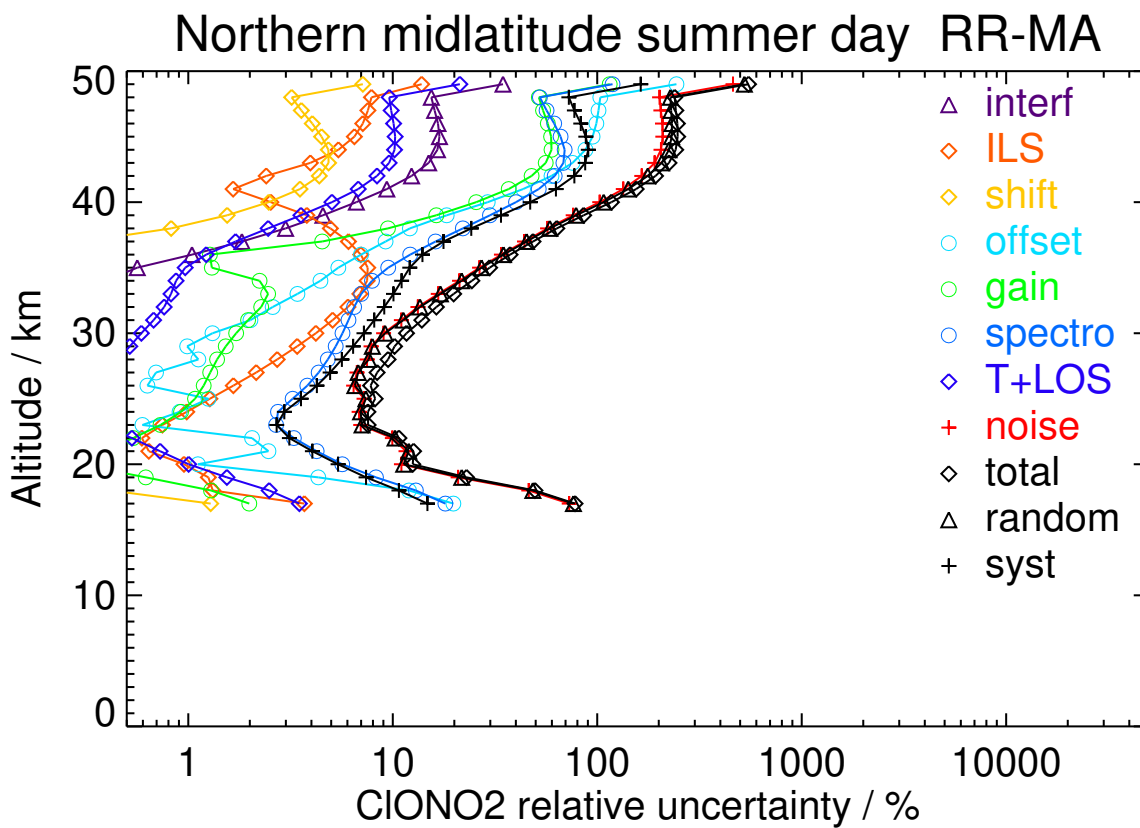


Figure S81: V8R_CLONO2_561 Northern midlatitude summer day

Table S86: CIONO2 error budget for Northern midlatitude summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	173.48	0.15	1.48	0.34	6.90	0.68	14.27	2.70	32.88	34.09	13.45	36.64
22	545.06	0.24	2.85	0.67	10.02	3.29	17.09	2.81	47.95	49.47	16.48	52.14
25	831.04	0.32	9.38	0.79	9.52	8.84	25.53	2.55	53.85	54.99	28.13	61.77
28	940.01	0.57	21.51	0.54	9.01	12.37	38.07	3.58	59.25	60.42	44.95	75.30
31	879.31	1.32	33.04	1.81	11.86	14.18	40.41	4.28	65.13	66.64	53.76	85.62
34	662.53	1.55	30.42	1.93	15.13	10.54	37.47	3.93	72.15	74.00	49.19	88.86
37	391.32	3.27	13.27	0.46	15.73	7.28	39.25	3.89	75.37	77.27	41.86	87.88
40	186.80	5.58	3.15	1.97	20.97	19.78	38.26	4.20	76.70	80.05	42.80	90.77
43	75.88	7.03	1.00	2.33	30.90	24.46	32.28	4.29	79.26	85.70	40.07	94.61
46	28.18	5.78	1.71	1.53	31.56	19.28	20.51	3.53	66.95	74.51	27.75	79.51
49	16.37	3.75	1.65	0.81	24.81	12.34	11.23	2.52	47.14	53.57	16.41	56.03

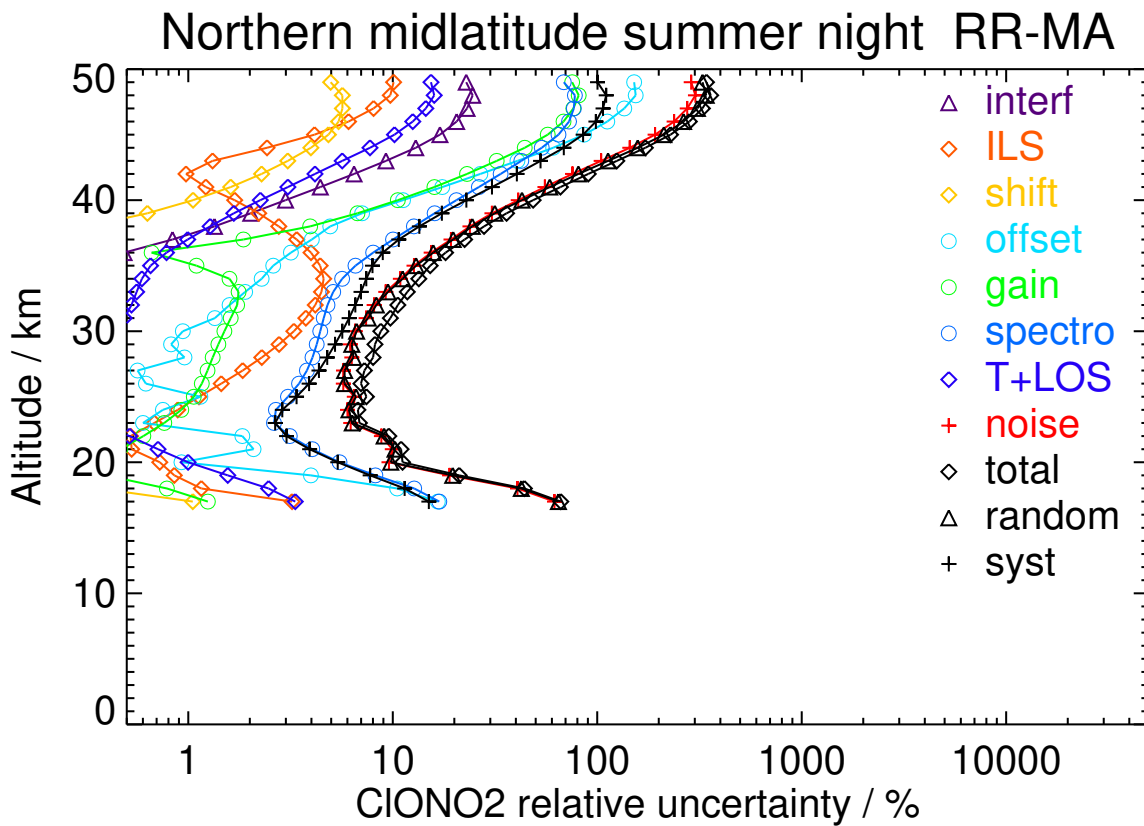


Figure S82: V8R_CLONO2_561 Northern midlatitude summer night

Table S87: CLONO2 error budget for Northern midlatitude autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	199.82	0.09	2.36	0.40	8.59	1.77	11.92	2.08	35.63	37.65	8.99	38.71
22	486.60	0.12	3.79	0.69	11.12	3.57	16.97	2.70	49.58	51.87	14.65	53.90
25	764.47	0.19	9.55	0.74	9.93	7.49	25.03	2.51	55.73	57.17	26.76	63.13
28	801.28	0.49	17.96	0.73	9.16	9.38	40.49	3.83	61.28	62.45	44.76	76.84
31	607.18	1.16	23.34	1.61	12.46	9.86	40.60	4.37	67.78	69.35	47.47	84.04
34	368.03	0.98	21.02	1.30	16.82	6.40	32.13	3.40	75.36	77.47	38.60	86.55
37	194.14	2.90	11.33	0.35	21.92	7.03	28.33	2.72	82.60	85.69	30.91	91.10
40	101.75	5.30	4.48	1.45	31.86	17.94	25.80	3.84	89.66	95.64	30.96	100.53
43	59.61	6.26	2.31	1.60	39.02	22.02	21.60	4.45	88.61	97.46	29.91	101.95
46	34.37	5.05	2.44	1.03	33.28	17.08	14.63	3.55	66.73	75.12	21.66	78.18

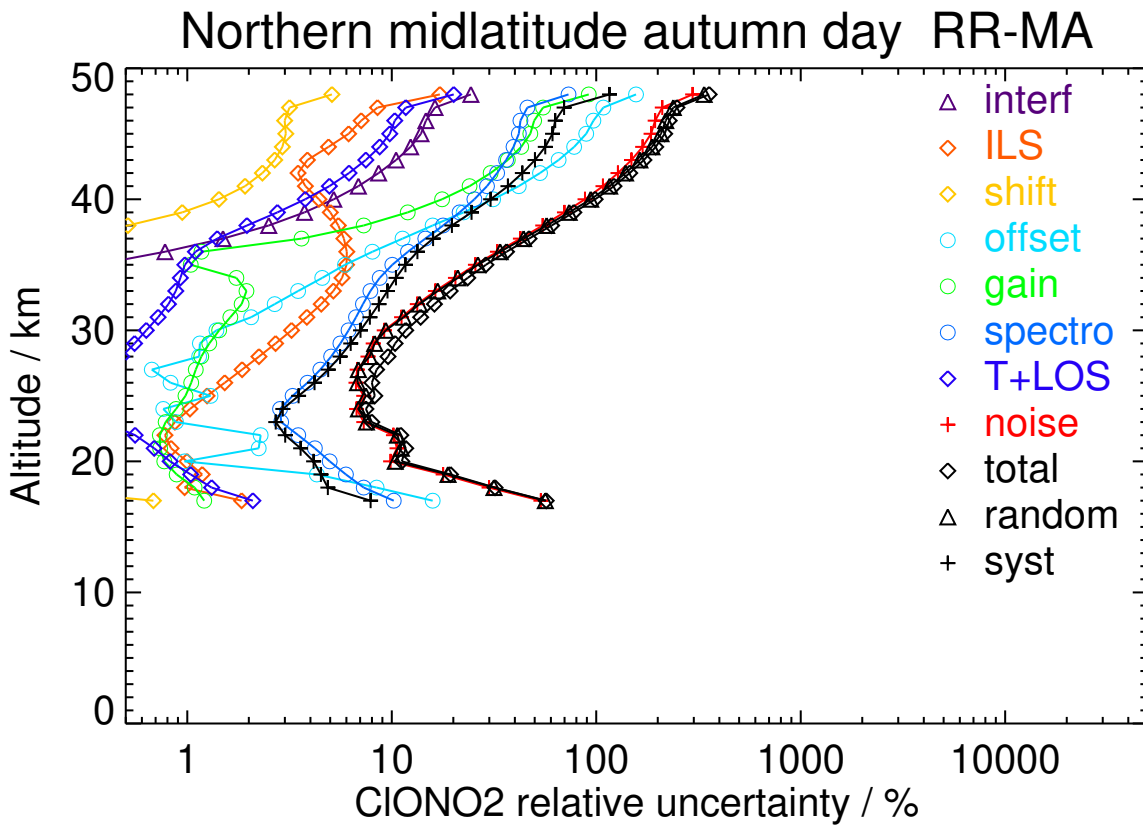


Figure S83: V8R.CLONO2_561 Northern midlatitude autumn day

Table S88: CIONO2 error budget for Northern midlatitude autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	256.26	0.12	2.69	0.44	8.58	2.09	15.34	2.51	35.95	38.65	11.20	40.24
22	598.95	0.17	4.36	0.81	11.17	3.77	18.18	2.84	49.47	51.61	16.75	54.26
25	893.48	0.25	10.27	0.80	10.00	8.69	28.85	2.86	55.33	56.86	30.84	64.68
28	992.27	0.51	19.08	0.75	9.16	12.14	44.69	4.07	61.40	62.80	49.36	79.88
31	869.56	1.04	25.18	1.63	12.52	12.55	48.68	4.90	67.81	69.40	55.92	89.13
34	665.59	0.97	24.26	1.60	16.89	9.28	44.39	4.43	75.40	77.62	51.14	92.95
37	445.21	2.59	14.25	0.29	22.16	6.04	42.57	3.75	82.93	86.14	44.95	97.16
40	243.64	4.48	5.92	1.08	32.19	17.21	37.63	4.03	90.54	96.54	41.21	104.97
43	99.58	5.22	2.01	1.37	39.14	21.27	28.69	4.27	89.02	97.79	34.95	103.84
46	30.60	4.40	1.85	0.93	33.13	16.39	17.50	3.39	66.62	74.85	23.32	78.40

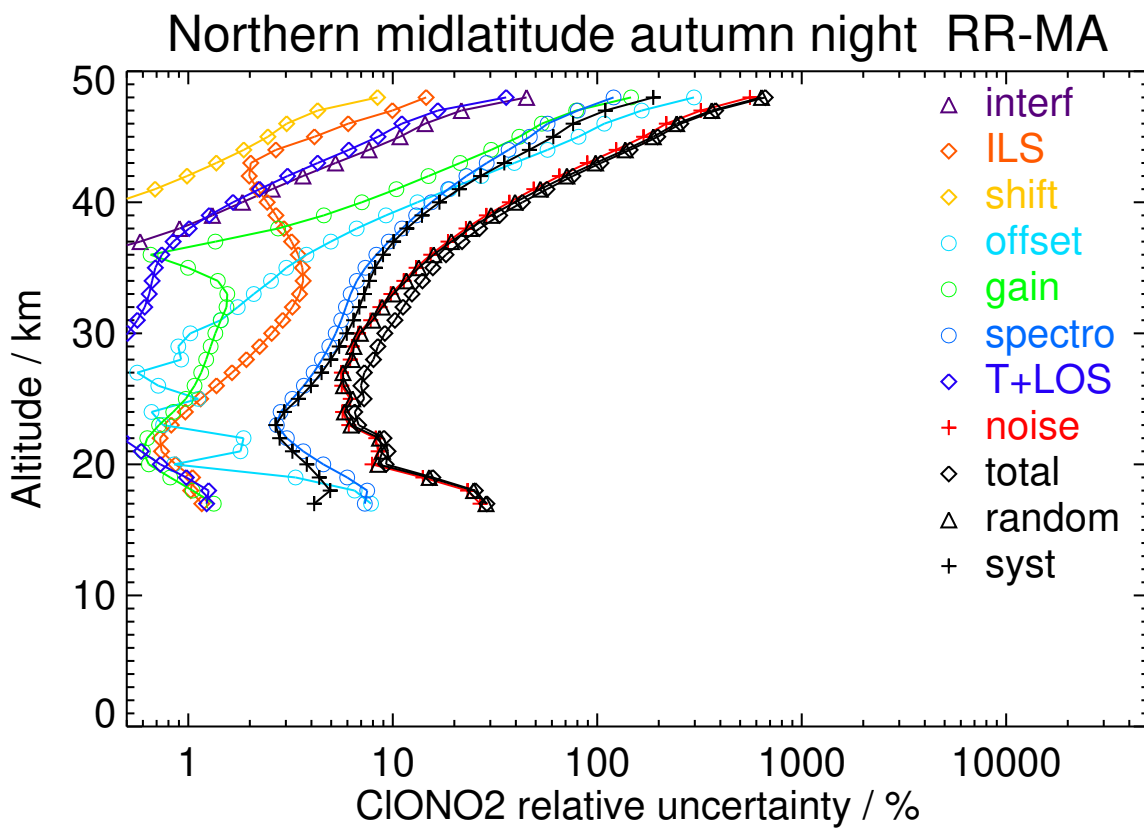


Figure S84: V8R_CLONO2_561 Northern midlatitude autumn night

Table S89: CLONO2 error budget for Tropics day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	14.00	0.07	2.00	0.27	8.16	0.49	8.80	1.36	36.97	38.48	6.05	38.95
22	229.12	0.14	1.68	0.45	10.24	2.03	14.30	2.42	48.87	50.48	12.71	52.06
25	478.33	0.19	7.91	0.57	9.05	4.58	16.67	1.75	54.28	56.08	15.76	58.25
28	517.61	0.48	19.54	0.68	8.73	6.97	27.21	2.53	59.01	60.69	32.43	68.82
31	377.48	1.23	26.59	1.52	12.07	9.33	24.56	2.96	65.26	66.81	36.75	76.25
34	203.58	1.15	22.70	1.19	15.54	6.51	19.12	2.17	72.99	74.81	30.07	80.62
37	83.46	3.23	9.28	0.83	17.27	9.25	23.35	2.65	77.58	79.68	26.51	83.98
40	33.79	4.82	0.83	2.47	25.43	23.44	25.64	4.64	81.03	85.41	34.32	92.04
43	25.20	6.17	4.22	2.68	34.80	29.93	25.93	5.78	83.09	90.75	39.27	98.89
46	16.91	5.42	4.32	1.72	32.90	23.90	20.83	4.71	67.30	75.46	31.56	81.80

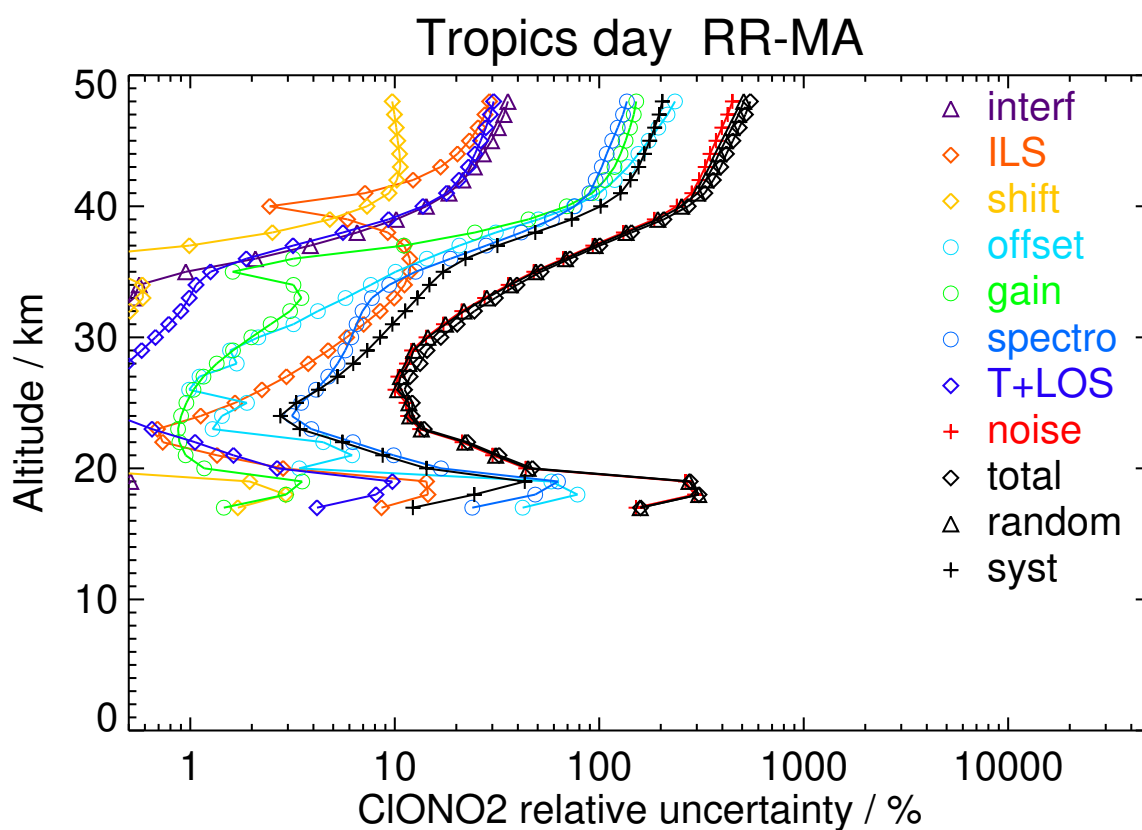


Figure S85: V8R_CLONO2_561 Tropics day

Table S90: CLONO2 error budget for Tropics night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	12.41	0.32	2.27	0.30	8.77	0.46	9.82	1.61	38.47	39.96	8.03	40.76
22	275.86	0.26	2.04	0.53	10.60	2.31	17.08	3.06	50.04	51.69	15.96	54.10
25	601.70	0.28	7.47	0.69	9.16	5.49	18.43	2.14	54.95	56.81	17.52	59.45
28	719.05	0.54	20.64	0.65	8.84	9.04	30.25	2.83	59.81	61.72	35.74	71.32
31	681.79	1.28	30.50	1.79	12.11	12.40	31.99	3.60	65.97	67.64	45.25	81.38
34	543.23	1.25	28.31	1.76	15.96	9.92	30.70	3.28	73.77	75.76	42.59	86.92
37	380.82	3.22	13.05	0.41	17.91	8.05	36.28	3.42	78.58	80.85	39.14	89.82
40	213.39	5.03	1.87	2.34	25.40	23.59	37.39	4.71	81.71	86.07	43.87	96.61
43	96.52	6.40	3.80	2.78	34.77	30.74	33.80	5.66	83.29	90.96	45.33	101.63
46	41.02	5.65	4.33	1.87	33.09	24.83	24.81	4.67	67.57	75.82	34.92	83.48

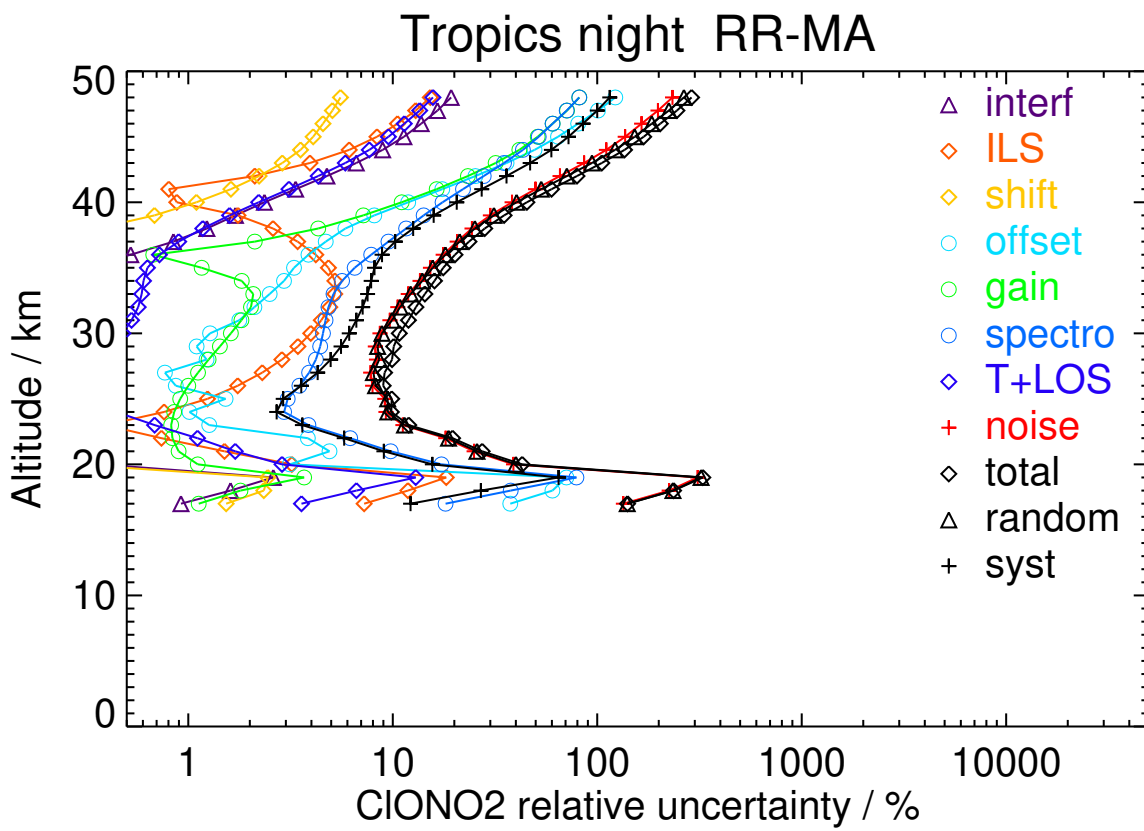


Figure S86: V8R.CLONO2.561 Tropics night

Table S91: ClONO2 error budget for Southern midlatitude winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	424.34	0.12	3.84	0.47	11.42	4.26	16.47	2.38	45.30	48.45	12.07	49.93
22	671.28	0.12	7.59	0.77	11.12	6.23	21.05	2.46	50.13	52.22	21.36	56.42
25	780.10	0.20	12.86	0.63	8.60	8.71	36.37	3.49	54.98	56.38	38.65	68.36
28	681.20	0.55	17.75	0.79	7.97	9.10	41.21	4.04	61.71	62.86	45.10	77.36
31	544.43	1.33	20.92	1.30	12.14	8.82	34.99	3.79	69.00	70.50	41.19	81.65
34	384.78	1.24	20.39	1.09	18.05	6.42	28.53	3.01	77.69	79.98	35.33	87.43
37	239.84	3.06	13.28	0.25	23.59	4.80	29.40	2.77	85.31	88.74	32.27	94.42
40	132.71	6.61	6.47	1.08	32.48	14.94	27.50	3.49	91.98	98.15	30.98	102.92
43	61.39	7.51	3.37	1.24	39.15	18.71	20.58	3.97	89.32	98.27	26.73	101.83
46	23.65	5.76	2.71	0.82	33.24	14.75	12.51	3.25	66.95	75.27	18.64	77.55

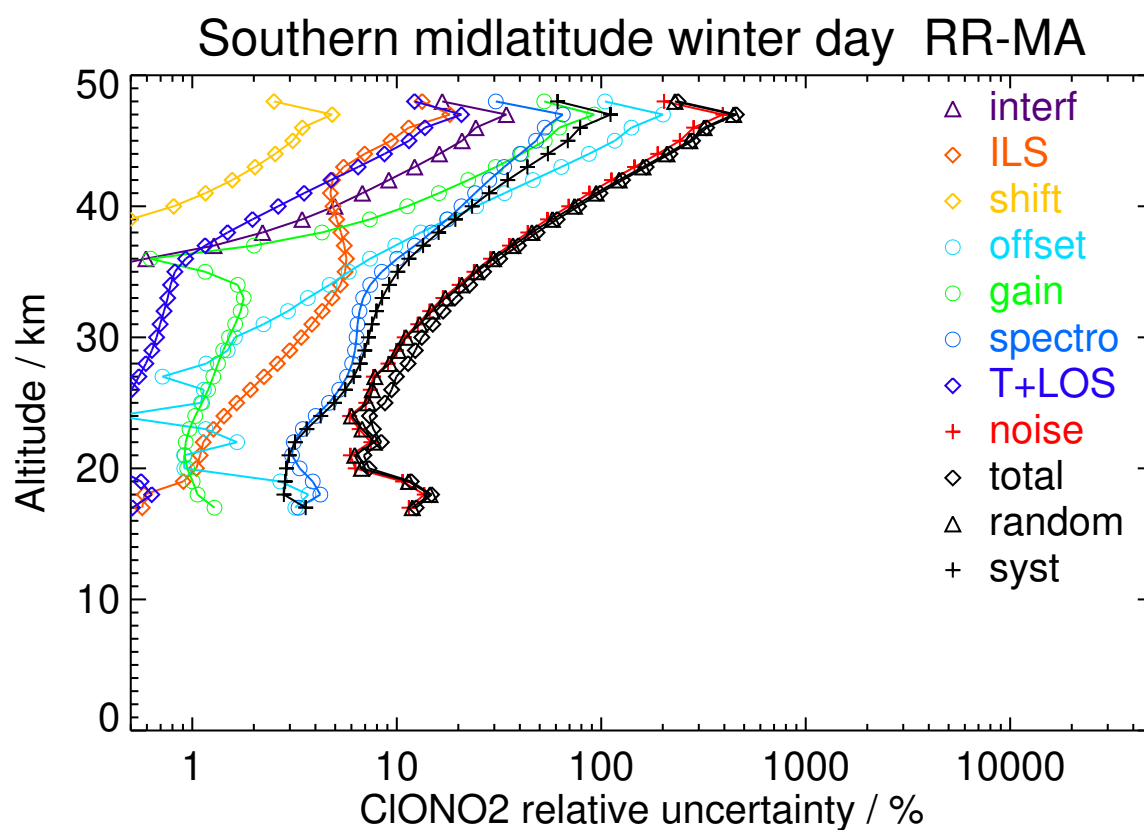


Figure S87: V8R_CLONO2_561 Southern midlatitude winter day

Table S92: CIONO2 error budget for Southern midlatitude winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	648.02	0.15	9.76	0.86	11.64	8.85	30.44	4.14	47.27	55.52	20.14	59.06
22	897.64	0.19	12.98	0.82	11.39	9.71	35.66	4.11	53.69	59.40	32.20	67.56
25	972.53	0.38	17.39	1.01	9.01	10.75	45.88	4.92	58.85	62.15	47.23	78.05
28	937.83	0.85	21.54	1.28	9.57	11.12	49.82	5.52	66.00	67.99	54.11	86.89
31	812.73	1.48	24.11	1.39	15.01	10.58	47.19	5.53	73.99	76.32	53.20	93.03
34	609.56	1.09	22.78	1.03	21.60	6.98	42.22	4.71	82.78	86.07	47.82	98.46
37	377.46	3.45	15.09	0.45	27.97	5.56	40.12	3.96	91.24	95.83	42.65	104.90
40	185.41	6.85	8.11	1.10	36.52	15.74	35.12	3.96	97.11	104.53	38.05	111.24
43	66.46	7.54	4.39	1.19	41.69	19.47	25.46	3.91	91.61	101.49	30.84	106.07
46	15.93	5.60	2.93	0.79	34.42	15.47	14.72	3.06	66.82	75.71	20.58	78.46

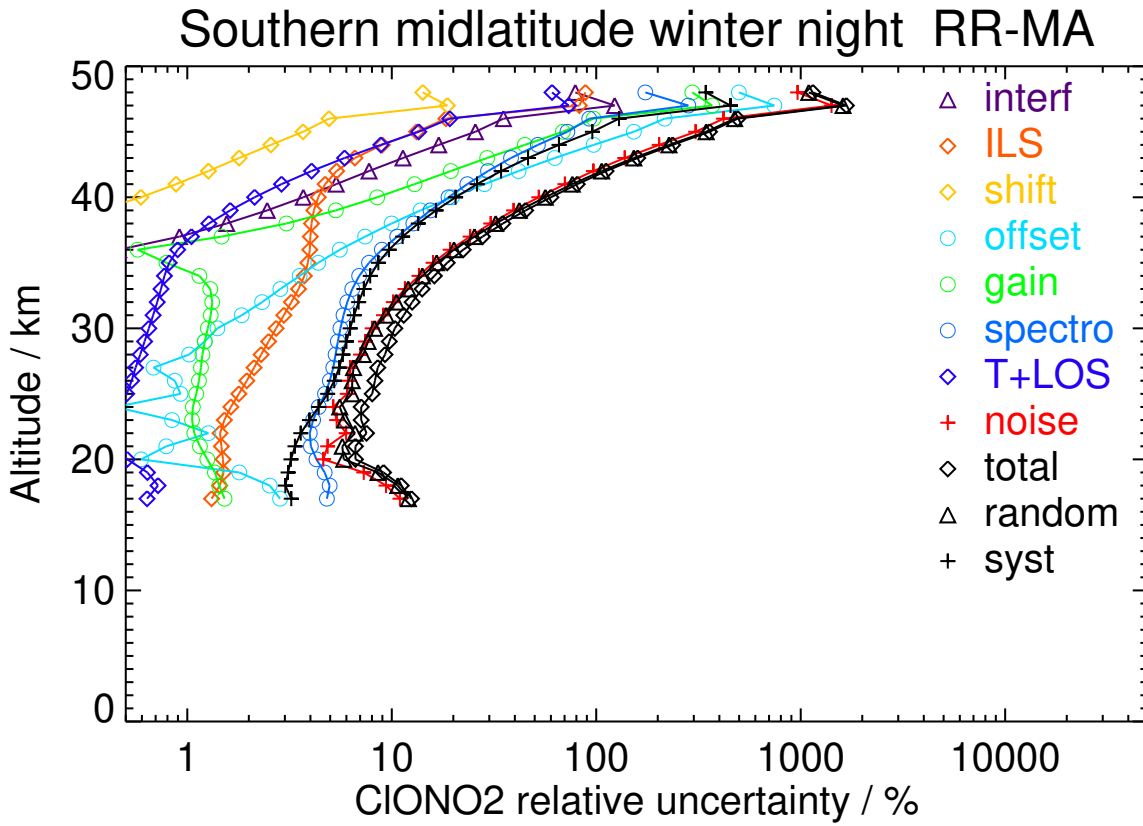


Figure S88: V8R_CLONO2_561 Southern midlatitude winter night

Table S93: CIONO2 error budget for Southern midlatitude spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	524.14	0.16	6.58	0.61	11.51	7.40	24.09	2.99	45.91	51.27	17.30	54.11
22	686.34	0.12	9.88	0.75	10.63	7.88	25.19	2.88	48.25	51.12	25.11	56.96
25	739.26	0.17	14.52	0.60	8.17	9.08	35.03	3.44	52.57	53.68	38.49	66.05
28	604.11	0.40	19.28	0.87	7.44	8.68	36.99	3.49	58.91	59.85	42.09	73.17
31	425.29	1.11	21.87	1.34	10.91	8.28	29.18	3.06	65.78	67.08	36.83	76.53
34	263.62	1.28	20.37	1.07	16.45	6.32	21.04	2.23	74.60	76.61	29.52	82.10
37	127.72	2.70	11.64	0.53	20.42	5.66	21.18	2.22	81.28	84.00	24.40	87.48
40	62.87	5.59	4.32	1.76	28.62	17.37	23.04	3.75	87.10	92.16	28.48	96.46
43	44.30	6.64	2.05	1.93	36.97	21.99	20.95	4.53	86.89	95.02	29.71	99.56
46	29.53	5.50	2.28	1.24	33.20	17.51	14.41	3.81	67.57	75.75	22.26	78.96

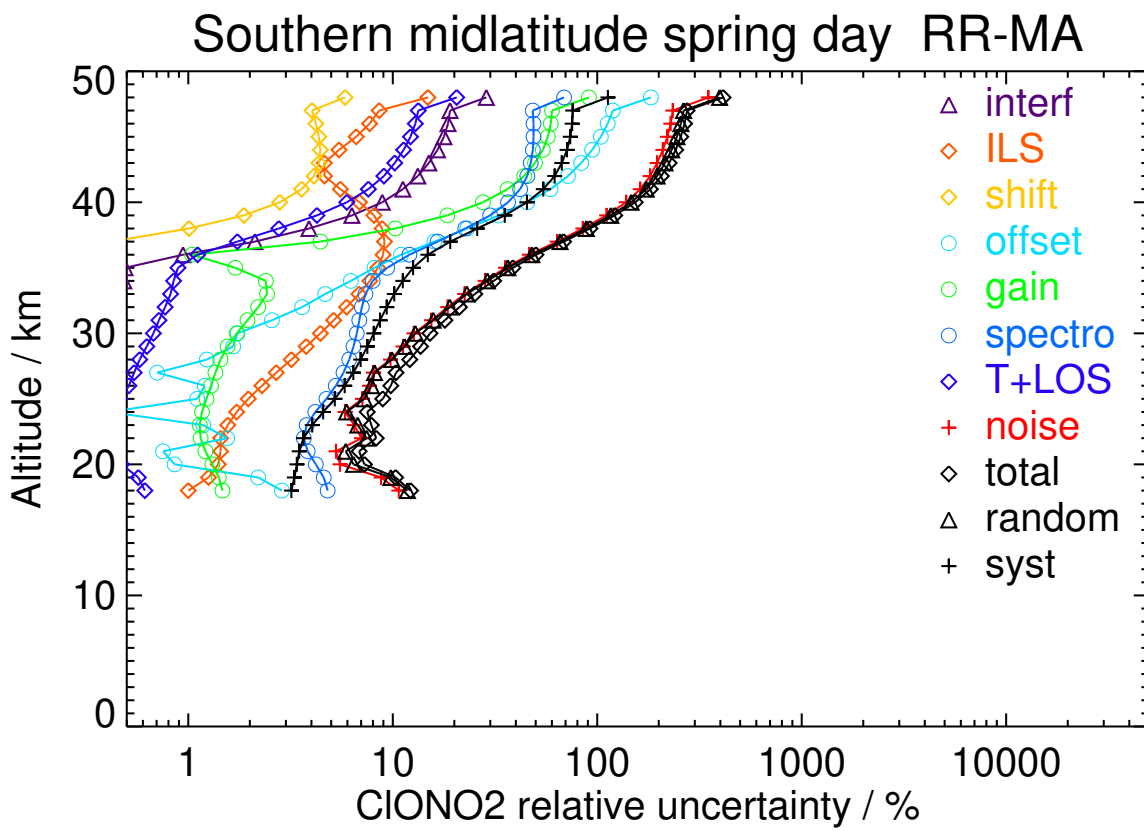


Figure S89: V8R_CLONO2_561 Southern midlatitude spring day

Table S94: CLONO2 error budget for Southern midlatitude spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	507.71	0.16	6.45	0.66	9.68	6.66	21.18	2.71	39.89	44.72	15.07	47.19
22	769.06	0.18	8.69	0.89	11.07	8.19	23.84	2.82	49.85	52.48	23.94	57.68
25	932.73	0.25	14.16	0.75	9.48	10.92	37.76	3.67	54.99	56.29	41.28	69.81
28	893.62	0.49	23.17	0.97	8.70	12.14	44.87	4.23	60.52	61.87	51.26	80.35
31	760.53	1.18	28.91	1.83	11.97	12.69	41.39	4.33	66.75	68.50	51.38	85.63
34	568.47	1.28	26.62	1.64	16.41	9.65	35.70	3.67	74.71	76.81	45.22	89.13
37	374.27	2.82	14.43	0.25	19.90	6.27	37.56	3.38	80.92	83.61	40.39	92.86
40	224.96	5.40	5.29	1.52	28.33	18.57	36.75	4.03	86.37	91.44	40.91	100.17
43	101.99	6.70	2.10	1.82	36.75	23.31	29.56	4.41	86.59	94.70	37.01	101.67
46	27.14	5.60	2.28	1.19	33.01	18.29	18.16	3.66	67.43	75.55	25.36	79.70

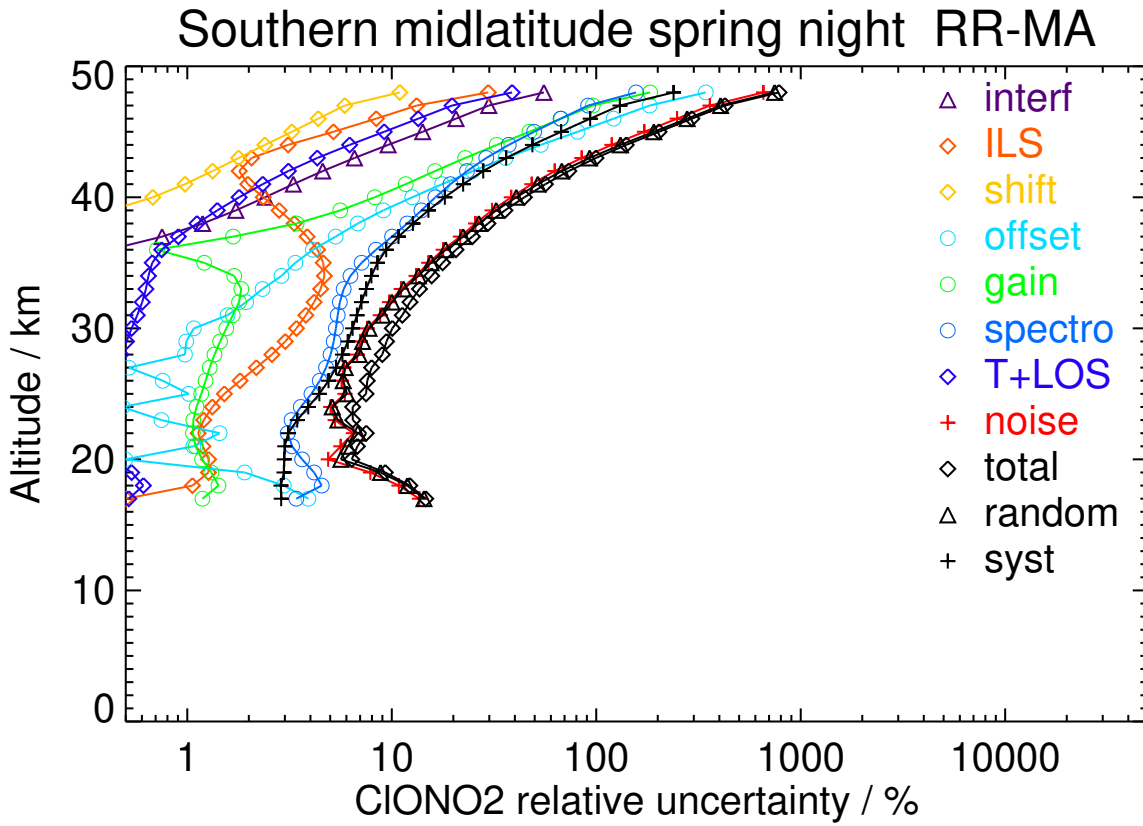


Figure S90: V8R_CLONO2_561 Southern midlatitude spring night

Table S95: CIONO2 error budget for Southern midlatitude summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
16	-28.00	0.15	3.72	1.06	14.51	0.55	6.41	1.76	45.57	47.97	6.77	48.44
19	150.37	0.08	1.78	0.59	3.39	0.73	13.00	2.31	25.07	25.84	12.29	28.61
22	478.87	0.14	2.85	0.57	7.10	3.34	16.05	2.52	40.51	41.70	15.37	44.44
25	739.18	0.20	9.99	0.69	8.18	8.01	24.46	2.26	49.62	50.71	26.95	57.42
28	752.90	0.46	22.44	0.74	8.84	10.01	37.71	3.54	56.33	57.39	44.67	72.73
31	530.44	1.24	30.26	2.01	12.38	10.78	35.03	3.92	63.50	65.27	46.97	80.41
34	259.47	1.34	23.38	1.46	15.16	6.24	25.36	2.70	70.77	72.75	34.43	80.48
37	94.53	3.21	8.67	0.87	15.97	9.60	24.81	2.78	74.26	76.22	27.58	81.06
40	42.90	4.99	1.56	2.48	23.39	21.54	27.44	4.23	77.50	81.55	34.22	88.44
43	27.58	6.48	2.50	2.60	33.43	26.17	28.29	4.79	80.57	88.14	37.45	95.77
46	23.74	5.54	3.19	1.64	33.22	20.69	20.44	3.85	67.24	75.69	28.29	80.81
49	18.32	3.71	2.90	0.91	25.70	13.63	11.96	2.71	46.80	53.83	17.65	56.65

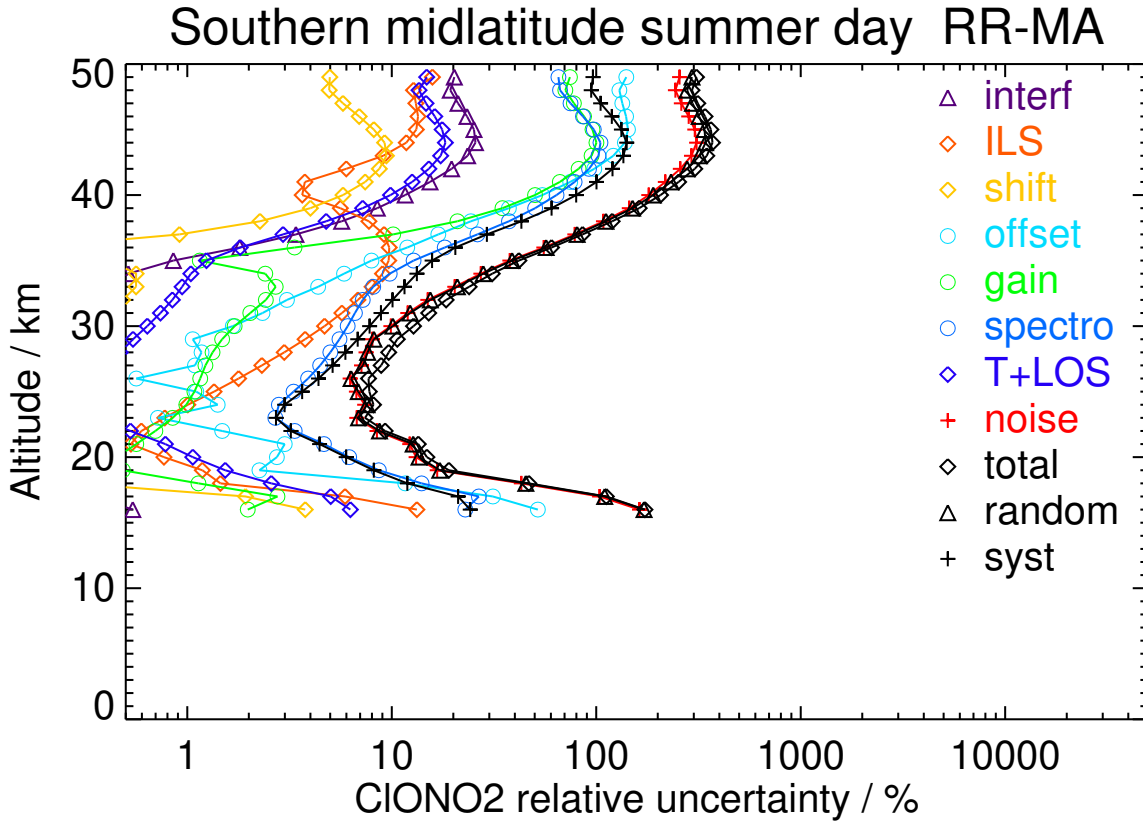


Figure S91: V8R_CLONO2_561 Southern midlatitude summer day

Table S96: CIONO2 error budget for Southern midlatitude summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	169.12	0.17	1.50	0.46	5.80	0.86	15.27	2.66	29.65	30.89	14.20	34.00
22	555.03	0.25	3.08	0.68	9.64	3.82	18.47	2.88	44.85	46.75	17.13	49.79
25	852.75	0.33	10.75	0.83	9.36	9.70	27.74	2.67	51.77	53.09	30.61	61.28
28	922.91	0.60	24.41	0.68	9.16	12.55	40.17	3.74	57.69	58.91	48.20	76.12
31	800.67	1.33	34.68	2.27	12.44	13.92	39.65	4.33	63.87	65.68	53.99	85.02
34	578.50	1.49	29.93	2.13	15.75	10.08	33.85	3.59	71.24	73.38	45.84	86.52
37	357.47	3.45	11.70	0.48	16.24	8.44	35.78	3.50	74.80	76.92	38.13	85.86
40	187.71	5.10	1.08	2.47	21.96	22.79	38.62	4.48	76.62	80.33	44.33	91.75
43	87.42	6.68	3.58	2.84	32.38	28.17	36.24	4.68	79.24	86.47	45.21	97.58
46	36.93	5.71	3.73	1.85	33.01	22.07	24.83	3.66	66.95	75.33	32.63	82.09
49	19.47	3.70	2.56	1.00	25.95	13.81	14.36	2.39	47.20	54.25	19.56	57.67

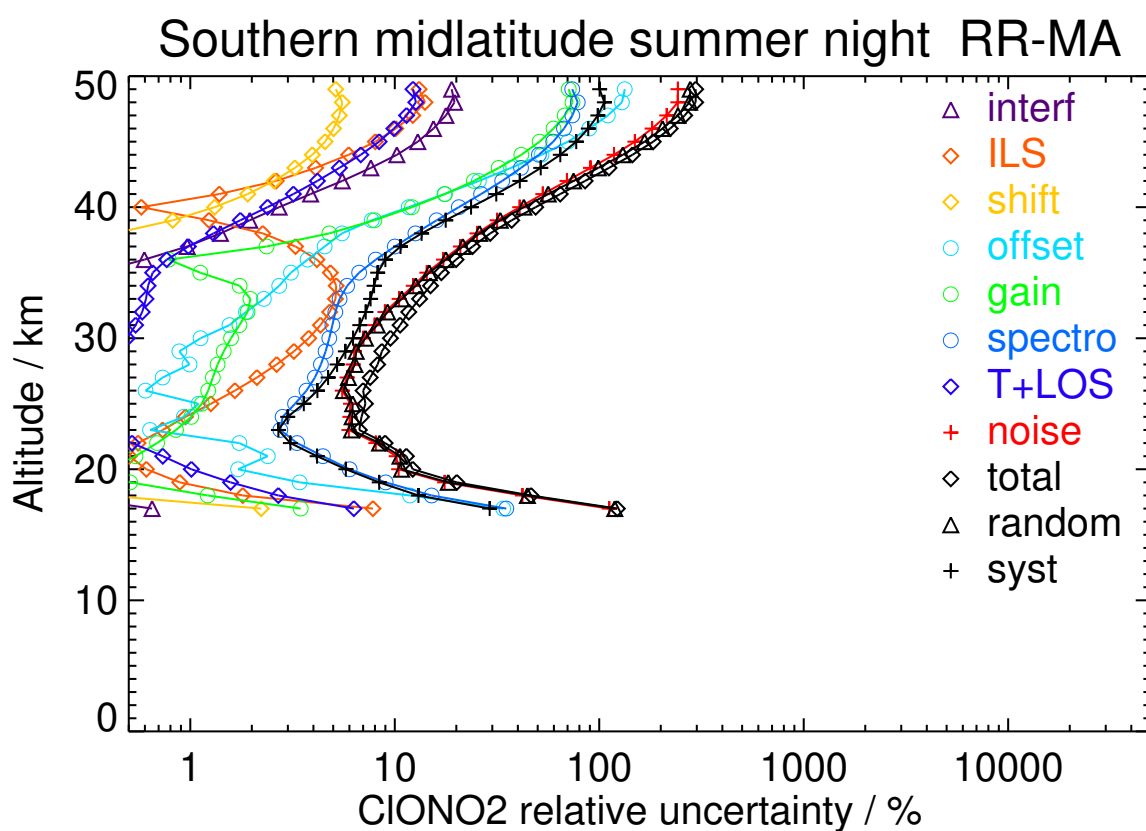


Figure S92: V8R_CLONO2_561 Southern midlatitude summer night

Table S97: CLONO2 error budget for Southern midlatitude autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	160.42	0.10	2.00	0.28	11.09	1.54	16.18	2.72	42.45	44.90	13.58	46.91
22	517.68	0.11	3.31	0.80	11.58	3.07	17.42	2.98	50.02	52.19	15.67	54.49
25	797.44	0.16	9.69	0.72	9.26	6.80	27.40	2.63	54.49	55.75	29.08	62.88
28	800.40	0.37	18.64	0.83	8.23	9.30	42.63	3.98	60.67	61.68	47.04	77.57
31	611.23	0.92	23.65	1.63	11.64	10.13	41.28	4.38	67.45	68.84	48.32	84.10
34	387.03	0.93	22.25	1.41	17.13	7.59	32.31	3.55	75.62	77.76	39.71	87.31
37	202.75	2.38	12.43	0.23	22.39	5.65	27.76	2.55	82.97	86.12	30.63	91.40
40	94.63	4.47	3.87	1.31	31.85	17.66	24.56	3.68	90.43	96.24	29.95	100.79
43	44.84	5.26	2.22	1.54	39.10	22.19	20.20	4.56	89.06	97.74	29.41	102.07
46	24.20	4.46	2.99	1.02	33.24	17.24	13.72	3.70	66.70	74.92	21.70	77.99

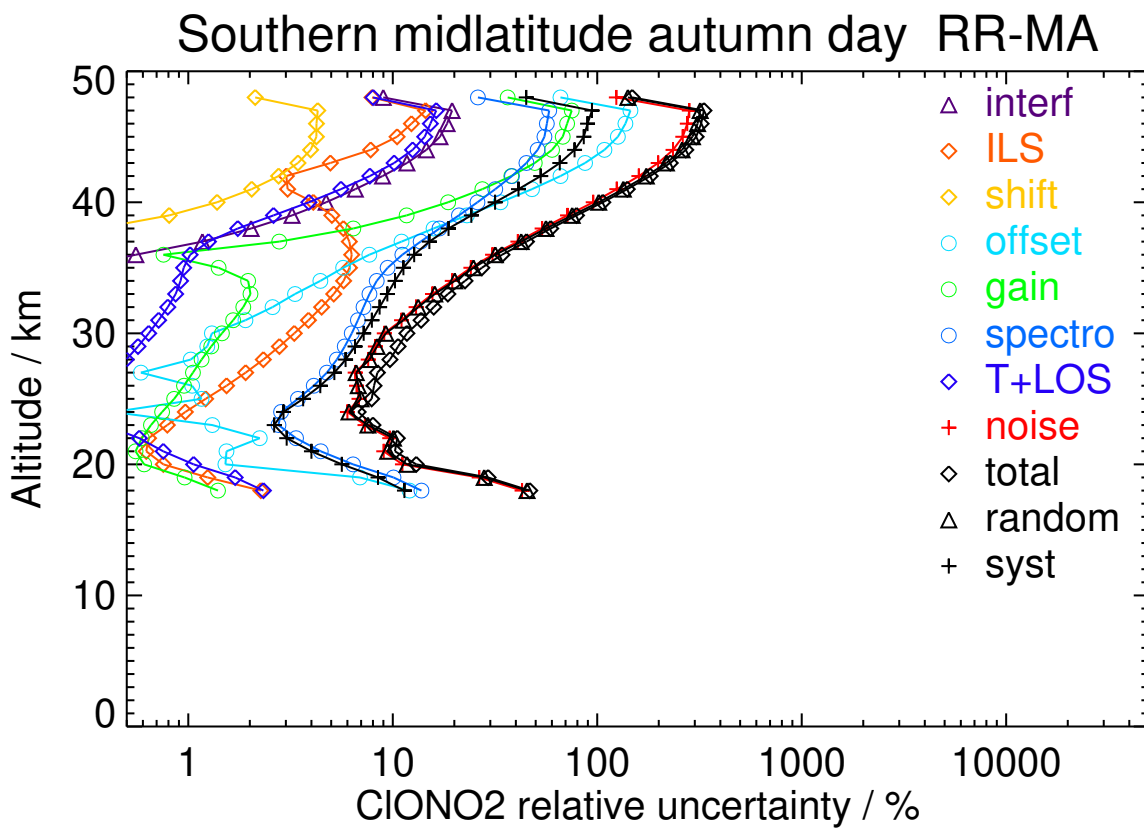


Figure S93: V8R.CLONO2_561 Southern midlatitude autumn day

Table S98: CIONO2 error budget for Southern midlatitude autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	184.73	0.15	2.14	0.35	10.94	1.65	17.28	2.94	42.80	45.36	14.47	47.61
22	577.61	0.19	3.38	0.83	11.54	3.50	20.30	3.38	50.83	53.33	17.91	56.26
25	923.45	0.29	9.83	0.83	9.19	8.49	29.08	2.92	55.32	56.71	30.85	64.56
28	984.84	0.59	19.21	0.78	8.42	11.22	46.16	4.27	61.48	62.55	50.83	80.60
31	842.06	1.22	25.22	1.75	12.17	12.21	47.51	4.89	68.16	69.66	54.89	88.68
34	662.97	1.19	24.78	1.69	17.48	9.71	41.70	4.32	76.29	78.59	49.19	92.71
37	467.58	2.70	14.69	0.30	22.58	5.34	39.16	3.54	83.46	86.69	41.94	96.30
40	283.02	5.28	5.35	1.28	31.93	17.77	34.96	4.12	90.47	96.37	39.13	104.01
43	129.20	6.27	1.90	1.61	39.23	22.61	26.77	4.60	89.02	97.85	34.41	103.72
46	42.34	5.14	2.59	1.08	33.37	17.52	16.40	3.67	66.80	75.13	23.57	78.74

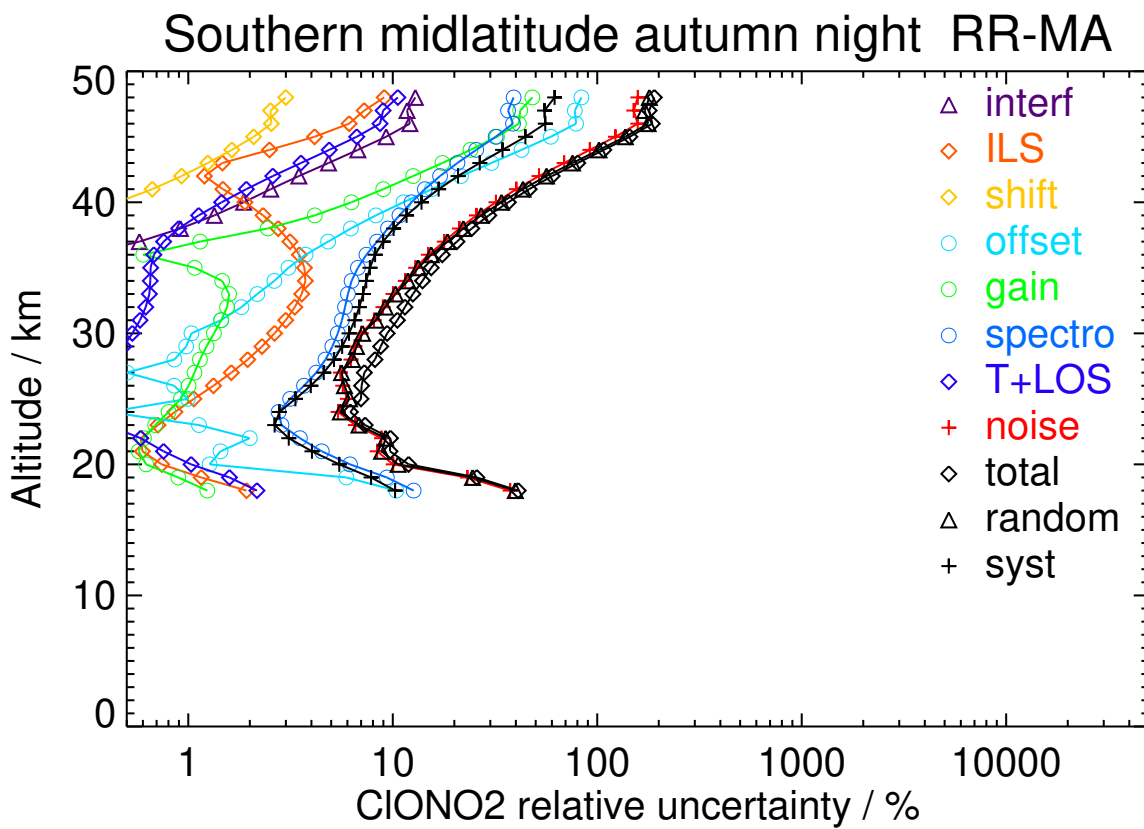


Figure S94: V8R_CLONO2_561 Southern midlatitude autumn night

Table S99: CLONO2 error budget for Southern polar winter day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	850.65	0.16	26.40	1.93	15.83	14.43	63.44	11.72	64.99	93.62	27.93	97.70
22	1314.77	0.26	25.90	1.57	11.01	12.39	71.00	10.46	61.38	81.43	56.88	99.33
25	1312.77	0.58	35.85	2.53	8.65	11.21	82.23	11.55	68.67	77.98	83.80	114.47
28	1022.85	1.26	37.73	2.88	12.27	10.01	74.24	11.53	73.53	78.05	81.51	112.85
31	711.09	1.86	33.14	2.12	19.11	8.25	56.59	8.94	79.74	83.49	64.88	105.73
34	425.90	0.95	25.50	0.93	25.64	3.53	40.24	5.68	87.60	91.98	46.77	103.18
37	221.40	4.83	13.25	0.74	31.03	9.84	29.26	3.69	94.79	100.33	32.38	105.43
40	126.47	9.41	5.01	1.78	38.42	21.99	22.70	5.02	100.09	108.29	30.13	112.40
43	71.93	9.53	4.74	1.68	42.41	24.96	17.05	5.39	92.49	102.85	28.86	106.82
46	19.77	6.61	4.35	1.12	34.07	19.70	10.72	4.19	66.04	74.98	22.01	78.14

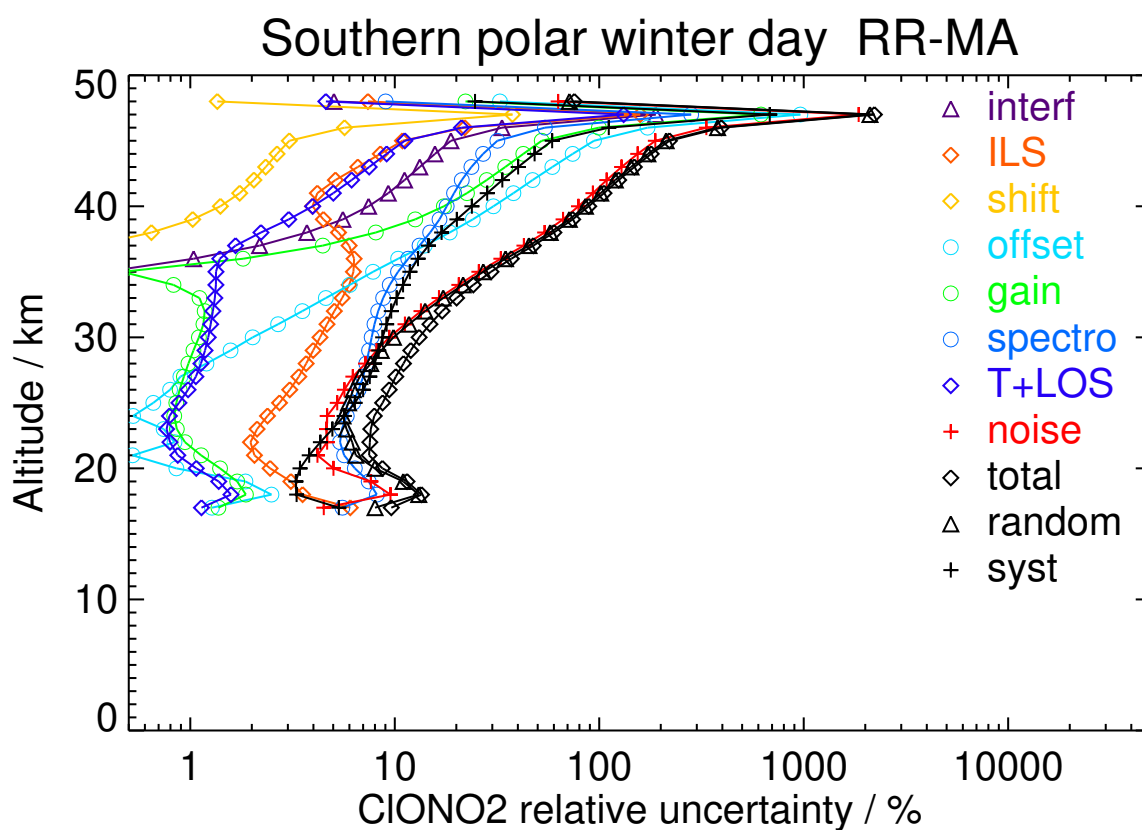


Figure S95: V8R_CLONO2_561 Southern polar winter day

Table S100: CIONO2 error budget for Southern polar winter night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	949.67	0.25	24.58	2.21	17.57	16.03	67.81	12.52	69.96	99.58	30.13	104.04
22	1330.16	0.37	28.62	2.06	9.18	14.33	70.87	10.91	55.92	81.88	51.74	96.86
25	1427.49	0.71	34.97	2.38	7.71	13.05	78.36	10.96	65.92	76.83	78.50	109.84
28	1187.10	1.24	40.05	3.06	11.89	11.47	76.86	11.47	72.18	78.02	83.96	114.62
31	858.64	1.73	37.16	2.47	19.05	9.22	62.74	9.60	79.26	83.57	71.87	110.22
34	520.41	0.96	28.85	1.15	25.79	4.37	46.52	6.52	87.42	92.14	53.65	106.62
37	257.44	4.43	14.91	0.65	30.87	10.12	34.47	4.08	94.30	100.10	37.09	106.75
40	90.32	8.53	6.25	1.62	38.20	22.88	26.71	4.86	99.52	107.93	32.99	112.86
43	6.79	8.55	6.28	1.60	42.65	26.13	19.63	5.13	92.39	102.99	30.96	107.54
46	-21.11	5.92	5.47	1.08	34.55	20.61	11.99	3.96	66.32	75.49	23.32	79.01

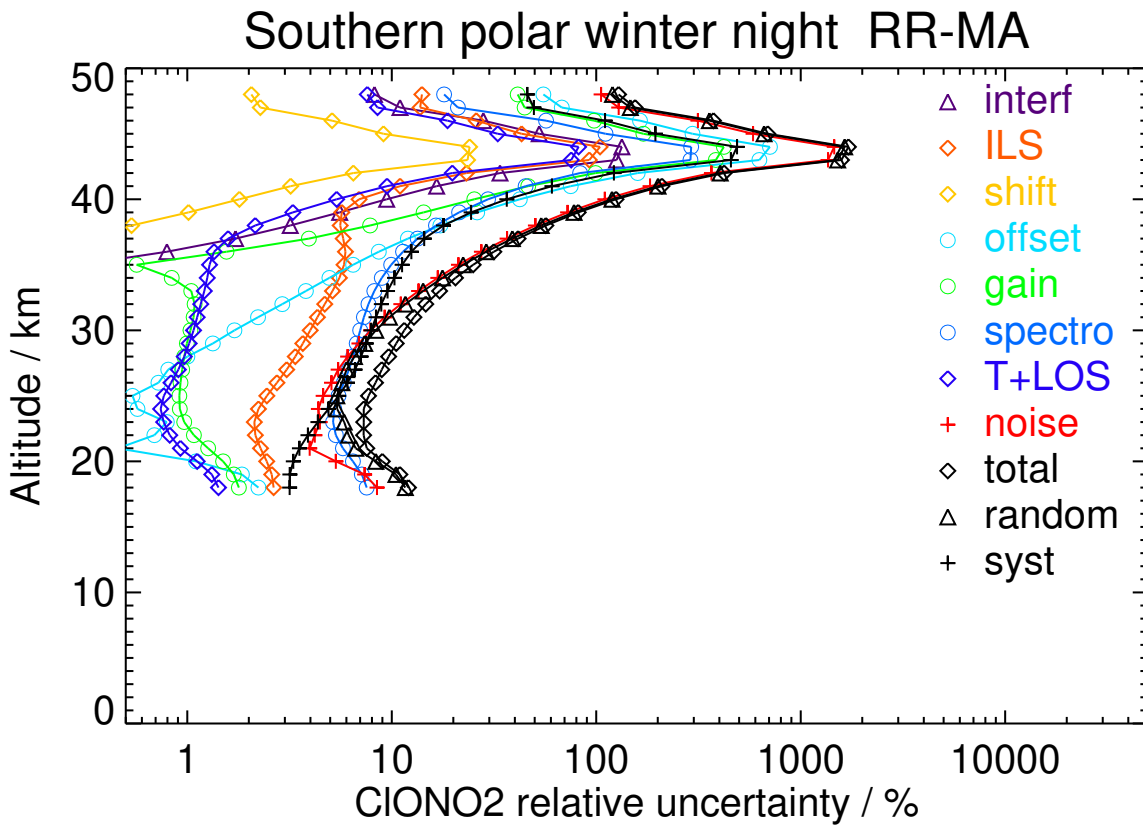


Figure S96: V8R_CLONO2_561 Southern polar winter night

Table S101: CLONO2 error budget for Southern polar spring day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	318.63	0.41	14.57	0.84	13.23	6.83	27.78	5.26	56.71	62.46	23.43	66.71
22	915.86	0.27	9.92	0.65	9.80	9.16	25.31	3.64	52.37	54.73	26.08	60.62
25	901.45	0.23	26.73	0.90	7.06	8.34	44.64	5.40	56.01	57.45	51.89	77.42
28	591.46	0.46	30.93	1.69	7.47	6.46	39.08	4.64	60.76	62.07	49.44	79.36
31	358.84	1.17	27.36	1.44	11.82	7.10	25.32	2.78	66.22	67.70	37.32	77.30
34	187.41	1.36	22.87	0.76	16.65	5.45	16.28	1.95	74.58	76.67	28.00	81.63
37	73.47	3.40	9.82	1.57	18.84	10.91	16.44	2.83	79.23	81.81	21.13	84.50
40	42.24	5.74	2.93	2.85	24.89	25.52	19.09	4.58	82.21	86.72	30.74	92.00
43	68.12	6.16	4.53	2.76	34.14	29.80	18.25	5.53	83.90	91.46	34.01	97.58
46	65.85	5.29	4.04	1.73	32.09	23.08	13.45	4.66	67.35	75.23	26.23	79.67

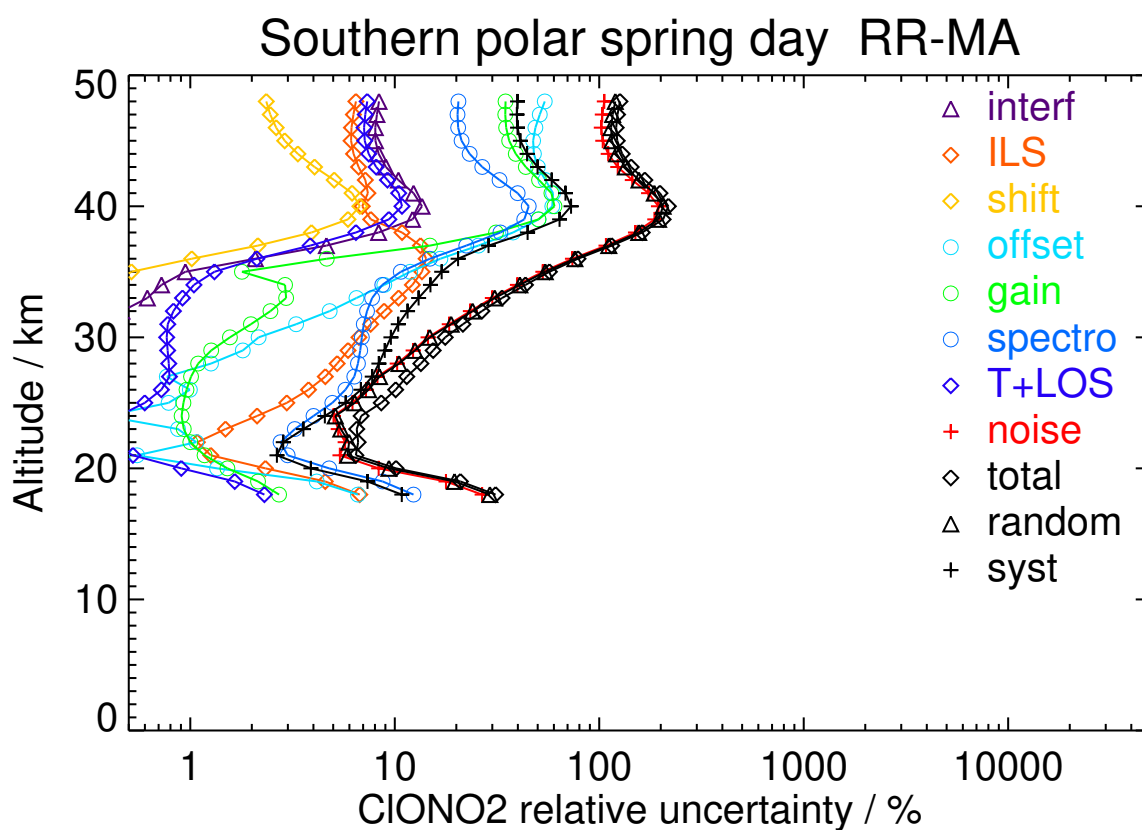


Figure S97: V8R.CLONO2.561 Southern polar spring day

Table S102: CIONO2 error budget for Southern polar spring night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	538.65	0.47	15.31	0.94	12.85	8.65	32.71	5.60	53.41	64.01	18.22	66.56
22	1000.71	0.32	11.89	0.85	10.38	11.09	30.87	4.44	52.01	55.92	30.40	63.65
25	1076.27	0.29	26.23	0.75	7.95	12.51	48.18	5.45	55.84	57.40	55.52	79.86
28	847.29	0.47	34.24	1.85	8.27	10.72	48.55	5.19	61.04	63.11	59.04	86.43
31	622.95	1.13	33.49	2.11	12.13	10.36	36.76	3.89	66.67	68.53	49.97	84.82
34	422.42	1.24	28.19	1.15	16.61	7.61	27.44	2.74	74.76	76.86	39.68	86.50
37	244.87	3.26	11.98	0.89	18.98	10.03	27.31	2.93	79.33	81.98	30.69	87.54
40	115.49	5.33	2.99	2.31	25.58	24.52	27.75	4.22	82.64	87.37	35.82	94.43
43	49.82	5.86	4.98	2.32	34.76	28.62	23.21	4.89	84.31	92.02	35.99	98.80
46	15.88	5.08	4.56	1.43	32.21	21.85	15.22	4.11	67.28	75.15	26.30	79.62

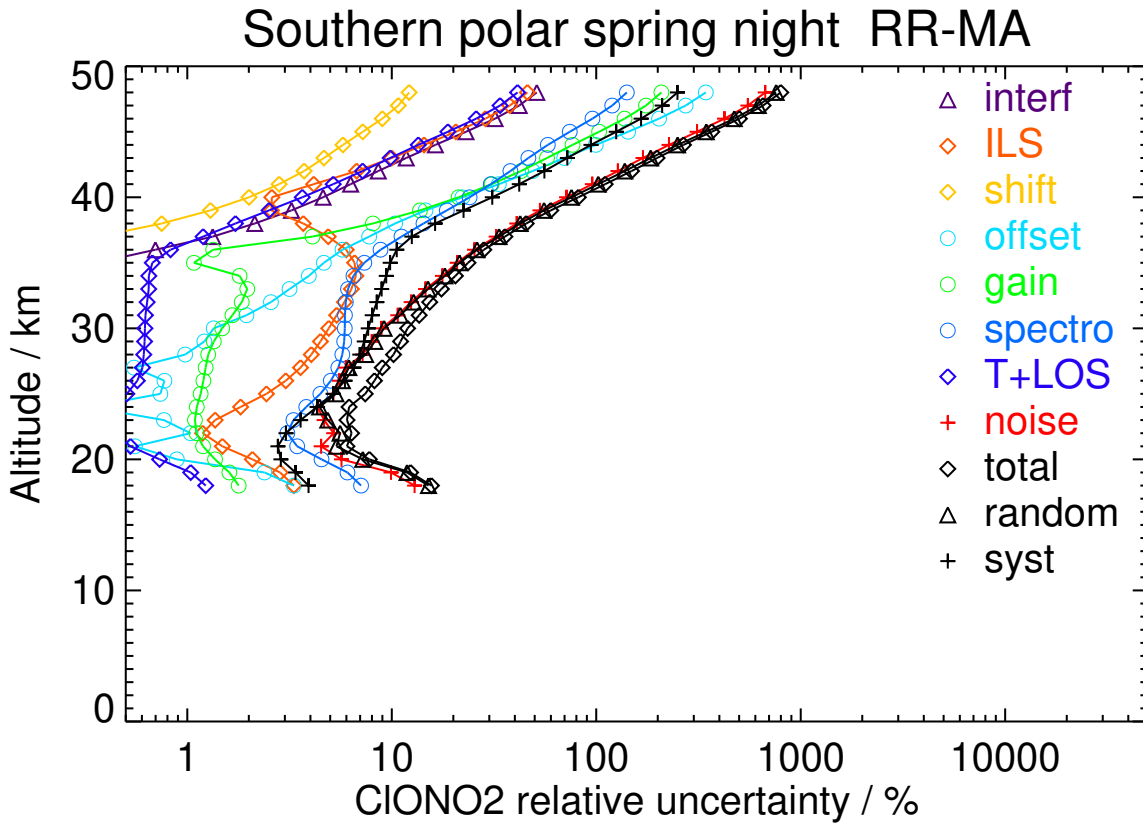


Figure S98: V8R.CLONO2_561 Southern polar spring night

Table S103: CIONO2 error budget for Southern polar summer day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	295.57	0.15	3.70	0.28	9.55	3.63	12.74	1.83	38.85	41.10	10.18	42.34
22	530.65	0.15	8.53	0.64	10.01	6.82	17.81	1.59	44.58	46.22	19.75	50.27
25	483.67	0.20	12.86	0.48	8.59	7.74	27.61	2.14	49.40	50.77	30.48	59.22
28	402.48	0.43	15.86	0.54	7.75	6.04	24.59	1.91	55.70	57.08	28.32	63.72
31	290.90	1.33	19.23	1.21	10.51	6.65	17.49	1.78	61.57	63.00	25.66	68.03
34	148.00	1.81	19.69	0.92	15.38	7.13	9.98	1.35	69.48	71.47	22.37	74.89
37	74.27	3.92	9.94	1.35	16.09	7.23	13.91	2.74	73.12	75.20	17.84	77.29
40	39.91	6.05	2.41	3.55	18.64	22.96	26.44	4.87	74.35	77.46	34.37	84.74
43	16.78	7.31	2.06	3.95	29.21	28.74	34.01	5.02	76.73	83.05	43.87	93.93
46	3.56	6.00	1.76	2.64	32.15	22.51	26.79	3.57	66.31	74.32	34.51	81.94
49	-0.90	3.75	1.01	1.45	26.74	14.25	16.06	2.28	48.24	55.49	21.11	59.37

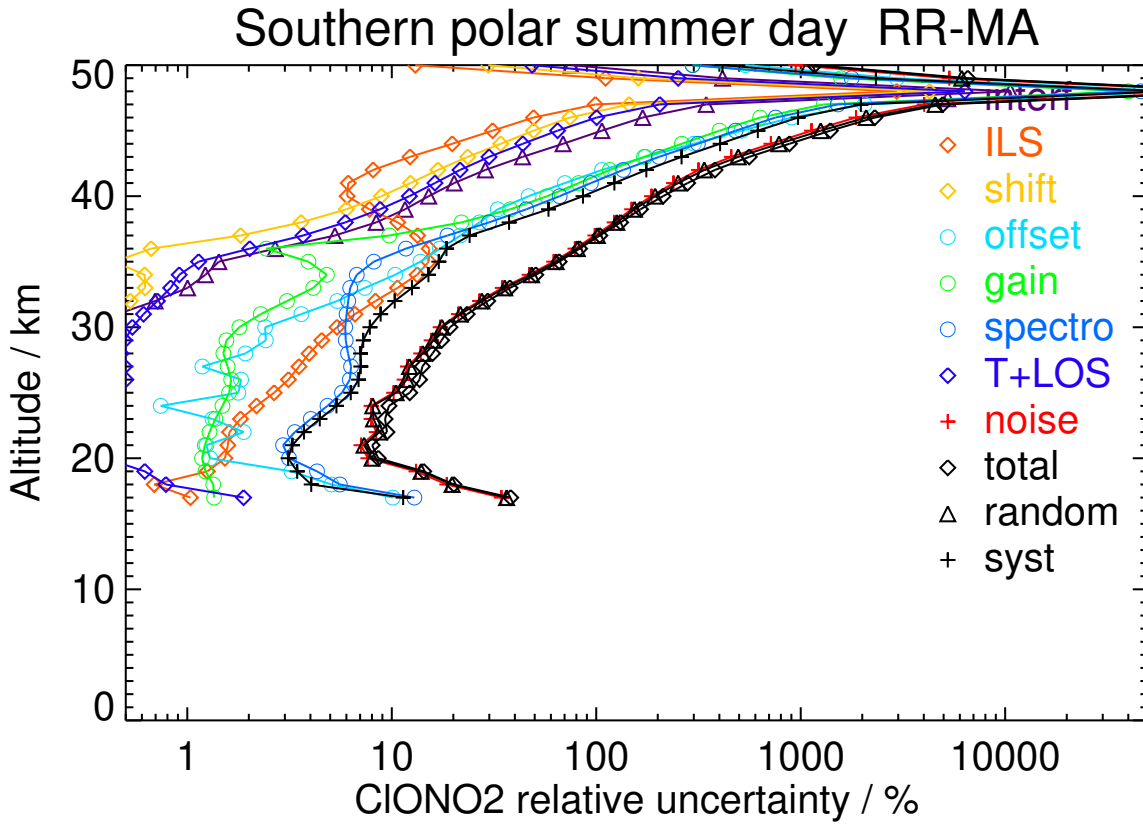


Figure S99: V8R_CLONO2_561 Southern polar summer day

Table S104: CLONO2 error budget for Southern polar summer night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	327.80	0.16	3.85	0.46	9.96	3.31	13.50	1.82	40.57	43.20	9.52	44.24
22	542.64	0.20	6.51	0.60	10.06	5.07	15.68	1.79	45.66	47.38	16.10	50.04
25	690.88	0.30	10.75	0.65	8.22	8.63	25.67	2.21	50.73	52.05	28.04	59.12
28	724.21	0.58	18.08	0.53	7.63	10.24	31.94	2.76	57.25	58.53	37.00	69.25
31	659.46	1.38	25.02	1.43	11.30	11.04	29.93	3.11	64.02	65.41	40.05	76.70
34	512.06	1.54	24.44	1.52	16.61	8.47	26.11	2.78	72.54	74.69	36.38	83.08
37	332.87	3.49	13.03	0.37	18.21	6.37	32.73	3.23	77.19	79.62	35.44	87.15
40	165.89	6.27	4.54	1.77	23.99	17.92	41.96	4.24	79.95	84.01	45.52	95.55
43	55.86	6.36	2.11	2.08	34.15	20.31	39.98	3.84	81.49	88.86	44.56	99.40
46	6.43	4.57	1.18	1.33	33.75	14.46	25.04	2.44	67.32	75.60	28.67	80.85
49	6.10	3.04	0.32	0.80	26.10	9.86	14.50	1.57	47.09	53.99	17.41	56.73

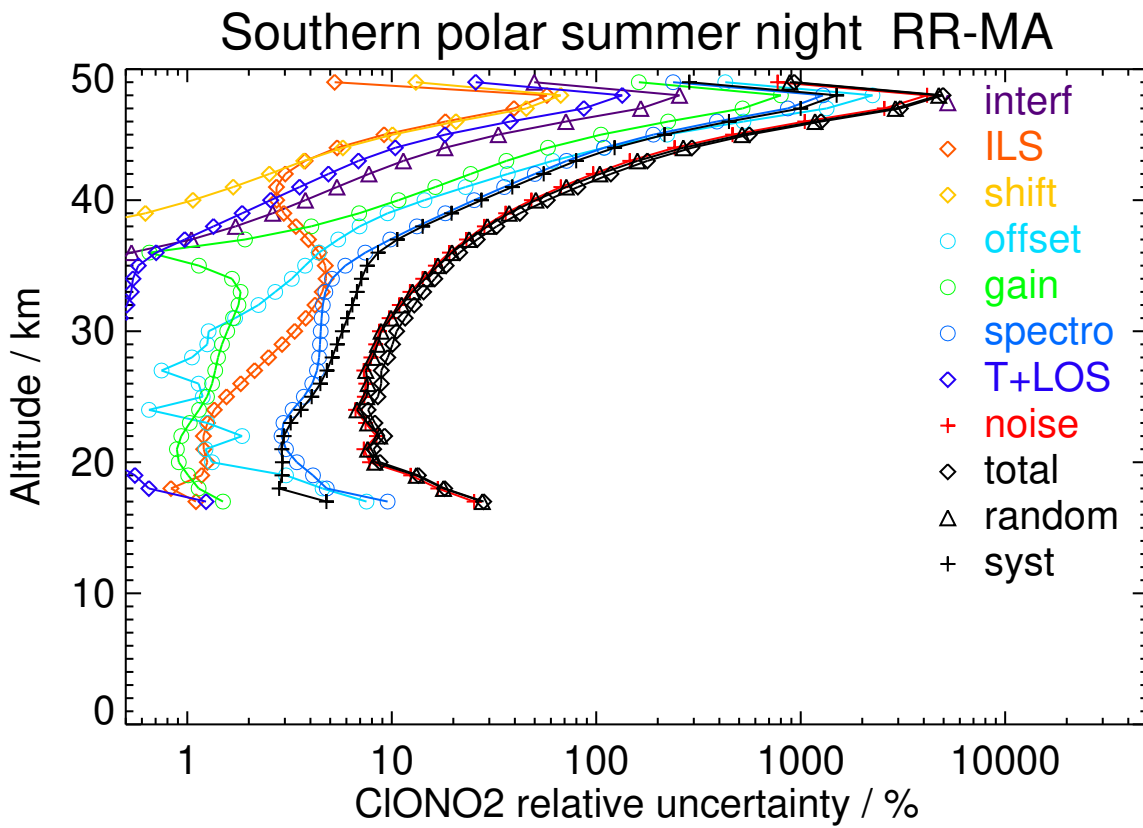


Figure S100: V8R_CLONO2_561 Southern polar summer night

Table S105: CLONO2 error budget for Southern polar autumn day. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	494.05	0.12	6.78	0.67	13.13	6.10	20.51	2.43	49.21	53.06	17.00	55.72
22	632.83	0.11	9.12	0.63	11.13	6.26	25.95	2.77	50.53	52.60	26.73	59.00
25	644.56	0.20	10.93	0.59	7.53	7.19	31.57	3.13	55.62	56.75	33.29	65.79
28	635.35	0.56	12.56	0.65	7.93	7.84	34.88	3.18	63.94	65.56	36.06	74.82
31	621.98	1.07	14.72	0.74	14.35	7.58	34.88	3.31	73.40	75.66	37.05	84.24
34	548.93	0.56	15.45	0.54	22.55	5.31	33.75	3.20	83.89	87.30	36.62	94.67
37	443.33	2.89	13.33	0.36	31.34	2.28	34.11	3.20	95.24	100.62	35.96	106.86
40	319.98	5.74	9.61	0.47	40.42	6.32	29.91	3.09	103.22	111.27	31.26	115.58
43	185.50	5.83	5.30	0.42	42.88	7.94	19.84	2.63	93.52	103.25	21.25	105.41
46	94.00	3.88	2.02	0.28	33.62	6.65	10.28	1.96	65.23	73.61	11.83	74.55

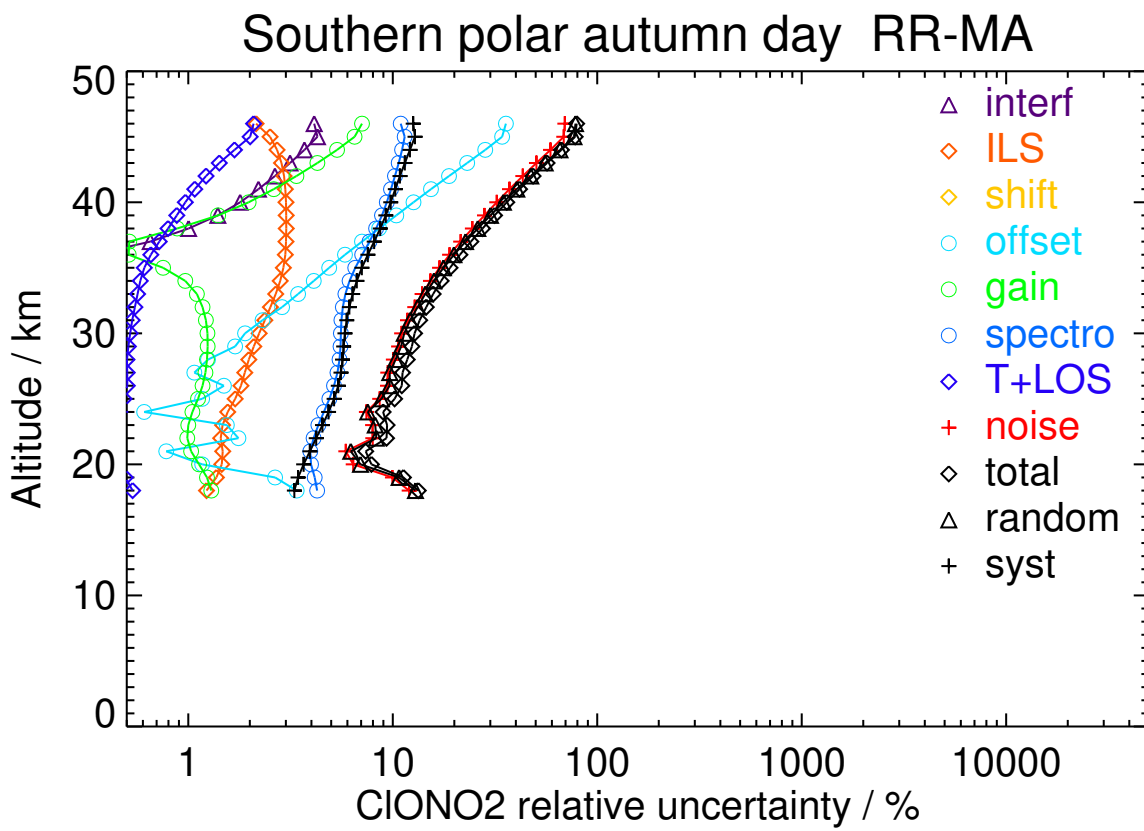


Figure S101: V8R_CLONO2.561 Southern polar autumn day

Table S106: CLONO2 error budget for Southern polar autumn night. All uncertainties are 1σ .

altitude (km)	mean target (pptv)	interf (pptv)	ILS (pptv)	shift (pptv)	offset (pptv)	gain (pptv)	spectro (pptv)	T+LOS (pptv)	noise (pptv)	random (pptv)	syst (pptv)	total (pptv)
19	529.67	0.13	8.02	0.70	13.25	6.68	30.07	3.51	49.93	56.22	23.10	60.78
22	573.82	0.17	9.80	0.60	11.27	6.73	28.06	3.34	51.79	54.28	28.34	61.24
25	569.57	0.33	9.92	0.59	7.45	6.98	28.27	2.80	57.08	58.84	28.40	65.33
28	626.51	0.71	12.14	0.62	8.63	7.68	30.35	2.77	65.70	68.12	29.77	74.34
31	687.55	1.13	14.54	0.67	15.67	7.50	33.21	3.17	75.47	78.32	34.47	85.57
34	646.52	0.66	15.30	0.51	24.31	5.22	34.88	3.36	86.28	90.16	37.37	97.60
37	516.17	2.82	12.98	0.39	33.33	2.23	34.81	3.32	97.95	103.77	36.62	110.04
40	348.12	5.51	8.86	0.45	42.00	6.36	29.36	3.04	105.05	113.46	30.77	117.56
43	184.42	5.70	4.45	0.37	43.69	8.15	19.13	2.58	94.20	104.12	20.80	106.18
46	59.13	4.07	1.24	0.24	33.63	7.33	9.38	2.04	65.04	73.43	11.51	74.33

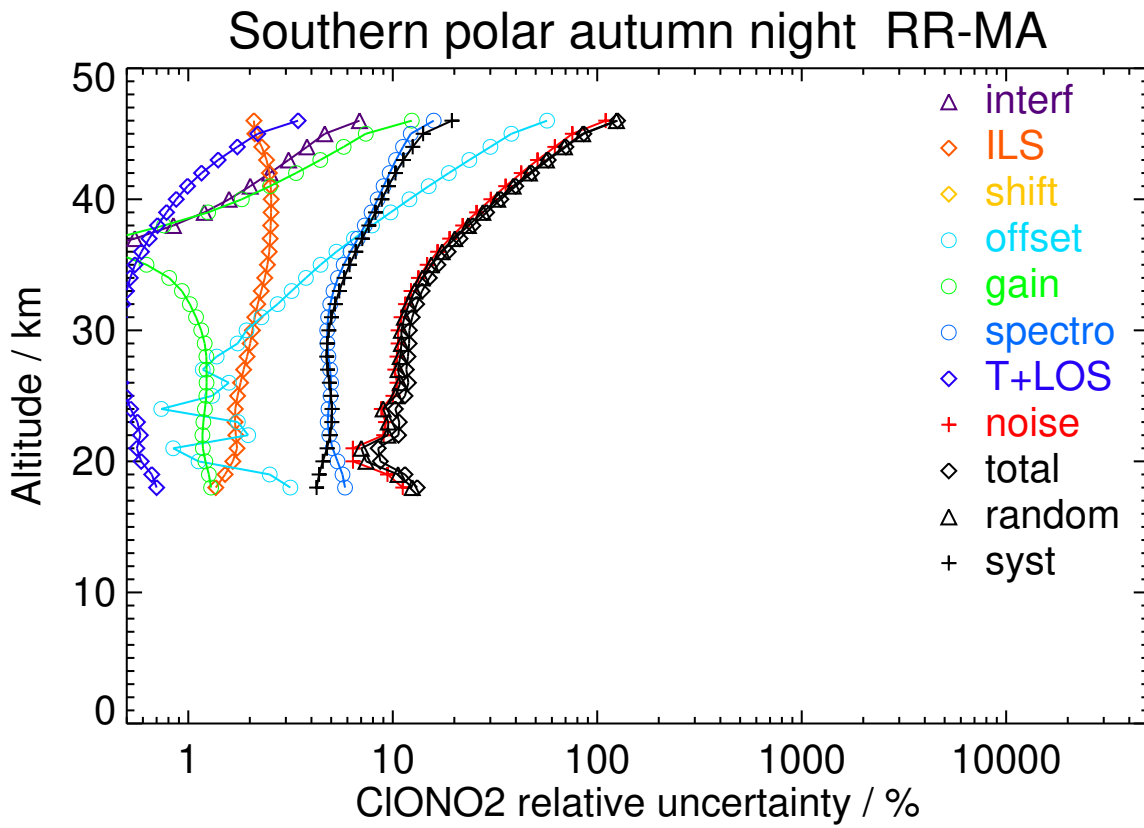


Figure S102: V8R.CLONO2_561 Southern polar autumn night

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