

Supplement to
Version 8 of IMK/IAA MIPAS reactive nitrogen reservoir gases:
Error estimates for HNO₄

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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.

In the plots, the errors are presented as relative errors in percent, even if they are of additive nature, i.e., do not scale with the retrieved volume mixing ratio. They were calculated with respect to the average peroxyacetic acid profile that was calculated from the single geolocations which contribute to the respective representative atmospheres.

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° N – 90° N	< 90°
Northern polar winter night	Jan, Feb	65° N – 90° N	> $\beta_{\max}$
Northern polar spring day	Apr	65° N – 90° N	< 90°
Northern polar spring night	Apr	65° N – 90° N	> $\beta_{\max}$
Northern polar summer day	Jul, Aug	65° N – 90° N	< 90°
Northern polar summer night	Jul, Aug	65° N – 90° N	> $\beta_{\max}$
Northern polar autumn day	Oct	65° N – 90° N	< 90°
Northern polar autumn night	Oct	65° N – 90° N	> $\beta_{\max}$
Northern midlatitude winter day	Jan, Feb	40° N – 60° N	< 90°
Northern midlatitude winter night	Jan, Feb	40° N – 60° N	> $\beta_{\max}$
Northern midlatitude spring day	Apr	40° N – 60° N	< 90°
Northern midlatitude spring night	Apr	40° N – 60° N	> $\beta_{\max}$
Northern midlatitude summer day	Jul, Aug	40° N – 60° N	< 90°
Northern midlatitude summer night	Jul, Aug	40° N – 60° N	> $\beta_{\max}$
Northern midlatitude autumn day	Oct	40° N – 60° N	< 90°
Northern midlatitude autumn night	Oct	40° N – 60° N	> $\beta_{\max}$
Tropics day	Apr	20° S – 20° N	< 90°
Tropics night	Apr	20° S – 20° N	> $\beta_{\max}$
Southern midlatitude winter day	Jul, Aug	40° S – 60° S	< 90°
Southern midlatitude winter night	Jul, Aug	40° S – 60° S	> $\beta_{\max}$
Southern midlatitude spring day	Oct	40° S – 60° S	< 90°
Southern midlatitude spring night	Oct	40° S – 60° S	> $\beta_{\max}$
Southern midlatitude summer day	Jan, Feb	40° S – 60° S	< 90°
Southern midlatitude summer night	Jan, Feb	40° S – 60° S	> $\beta_{\max}$
Southern midlatitude autumn day	Apr	40° S – 60° S	< 90°
Southern midlatitude autumn night	Apr	40° S – 60° S	> $\beta_{\max}$
Southern polar winter day	Jul, Aug	65° S – 90° S	< 90°
Southern polar winter night	Jul, Aug	65° S – 90° S	> $\beta_{\max}$
Southern polar spring day	Oct	65° S – 90° S	< 90°
Southern polar spring night	Oct	65° S – 90° S	> $\beta_{\max}$
Southern polar summer day	Jan, Feb	65° S – 90° S	< 90°
Southern polar summer night	Jan, Feb	65° S – 90° S	> $\beta_{\max}$
Southern polar autumn day	Apr	65° S – 90° S	< 90°
Southern polar autumn night	Apr	65° S – 90° S	> $\beta_{\max}$

In the following three tables we summarize the ingoing errors for the retrievals of HNO_4 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 1σ uncertainties affecting the retrieval of HNO₄ (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)
offset (A band)	6 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
gain random (A band)	0.21%	Kleinert et al. (2018)	P(21;22)
gain systematic (A band)	1.15%	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., 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(BrONO ₂)	3.73E-18 - 5.16E-06 ppmv	climatology (Höpfner et al., 2021)	P(7;11)
vmr(C ₂ H ₂)	2.98E-06 - 1.01E-05 ppmv	V5 retrieval (Glatthor et al., 2007)	G(6)
vmr(C ₂ H ₄)	1.00E-24 - 1.32E-06 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(C ₂ H ₆)	2.85E-07 - 8.69E-05 ppmv	V5 retrieval (Glatthor et al., 2007)	G(6)
vmr(CCl ₄)	2.87E-08 - 2.63E-06 ppmv	V5 retrieval (Eckert et al., 2017)	G(6)
vmr(COF ₂)	7.02E-07 - 3.70E-05 ppmv	V5 retrieval (unpublished data)	G(6)
vmr(CHCl ₃)	3.19E-14 - 5.56E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CH ₃ Cl)	4.05E-07 - 5.88E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CH ₃ OH)	1.00E-24 - 2.95E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CO ₂)	7.56E-01 - 7.51E+00 ppmv	WACCM model calc. (Kiefer et al., 2021)	P(20)
vmr(CIO)	8.02E-05 - 5.90E-04 ppmv	preceding V8 retrieval (Glatthor et al., 2024)	G(6)
vmr(HCN)	1.50E-05 - 4.40E-05 ppmv	V5 retrieval (Glatthor et al., 2009)	G(6)
vmr(H ₂ O)	1.60E-01 - 2.54E+00 ppmv	preceding V8 retrieval (Kiefer et al., 2026)	G(6)
vmr(HNO ₃)	6.18E-05 - 4.78E-04 ppmv	preceding V8 retrieval (this paper)	G(6)
vmr(NH ₃)	7.18E-12 - 3.75E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(NO ₂)	3.09E-07 - 2.27E-04 ppmv	preceding V8 retrieval (Funke et al., 2026)	G(6)
vmr(OCS)	3.85E-05 - 2.11E-04 ppmv	V5 retrieval (Glatthor et al., 2017)	G(6)
vmr(acetone)	4.32E-07 - 8.48E-05 ppmv	V5 retrieval (unpublished data)	G(6)
vmr(PAN)	5.38E-07 - 1.51E-05 ppmv	V5 retrieval (Glatthor et al., 2007)	G(6)
vmr(CFC-113)	2.17E-07 - 1.21E-05 ppmv	V5 retrieval (unpublished data)	G(6)
vmr(HCFC-22)	4.51E-06 - 1.43E-05 ppmv	V5 retrieval (Chirkov et al., 2016)	G(6)
spectroscopic data	15%	May and Friedl (1993)	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 S3: Assumed 1σ uncertainties affecting the retrieval of HNO₄ (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)
offset (A band)	3 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
gain random (A band)	0.21%	Kleinert et al. (2018)	P(21;22)
gain systematic (A band)	1.15%	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	0.22 - 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(BrONO ₂)	3.73E-18 - 5.16E-06 ppmv	climatology (Höpfner et al., 2021)	P(7;11)
vmr(C ₂ H ₂)	3.22E-06 - 9.55E-06 ppmv	V5 retrieval (Glatthor et al., 2007)	G(6)
vmr(C ₂ H ₄)	1.00E-24 - 1.32E-06 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(C ₂ H ₆)	2.77E-07 - 7.56E-05 ppmv	V5 retrieval (Glatthor et al., 2007)	G(6)
vmr(CCl ₄)	3.05E-08 - 2.41E-06 ppmv	V5 retrieval (Eckert et al., 2017)	G(6)
vmr(COF ₂)	7.02E-07 - 3.70E-05 ppmv	V5 FR climatology (unpublished data)	G(6)
vmr(CHCl ₃)	3.19E-14 - 5.56E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CH ₃ Cl)	4.05E-07 - 5.88E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CH ₃ OH)	1.00E-24 - 2.95E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CO ₂)	7.56E-01 - 7.51E+00 ppmv	WACCM model calc. (Kiefer et al., 2021)	P(20)
vmr(CIO)	7.42E-05 - 6.51E-04 ppmv	preceding V8 retrieval (Glatthor et al., 2024)	G(6)
vmr(HCN)	1.54E-05 - 4.41E-05 ppmv	V5 retrieval (Glatthor et al., 2009)	G(6)
vmr(H ₂ O)	1.87E-01 - 2.24E+00 ppmv	preceding V8 retrieval (Kiefer et al., 2026)	G(6)
vmr(HNO ₃)	5.54E-05 - 4.51E-04 ppmv	preceding V8 retrieval (this paper)	G(6)
vmr(NH ₃)	7.18E-12 - 3.75E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(NO ₂)	2.03E-07 - 2.88E-04 ppmv	preceding V8 retrieval (Funke et al., 2026)	G(6)
vmr(OCS)	3.37E-05 - 2.14E-04 ppmv	V5 retrieval (Glatthor et al., 2017)	G(6)
vmr(acetone)	5.01E-07 - 8.07E-05 ppmv	V5 retrieval (unpublished data)	G(6)
vmr(PAN)	5.92E-07 - 1.55E-05 ppmv	V5 retrieval (Glatthor et al., 2007)	G(6)
vmr(CFC-113)	2.26E-07 - 1.14E-05 ppmv	V5 retrieval (unpublished data)	G(6)
vmr(HCFC-22)	4.78E-06 - 1.46E-05 ppmv	V5 retrieval (Chirkov et al., 2016)	G(6)
spectroscopic data	15%	May and Friedl (1993)	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 HNO_4 (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)
offset (A band)	3 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
gain random (A band)	0.21%	Kleinert et al. (2018)	P(21;22)
gain systematic (A band)	1.15%	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	0.22 - 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(BrONO ₂)	3.73E-18 - 5.16E-06	climatology (Höpfner et al., 2021)	P(7;11)
vmr(C ₂ H ₂)	0.00E+00 - 8.34E-08 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(C ₂ H ₄)	1.00E-24 - 4.39E-11 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(C ₂ H ₆)	2.83E-15 - 5.92E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CCl ₄)	1.00E-10 - 2.71E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(COF ₂)	7.02E-07 - 3.79E-04 ppmv	V5 climatology (unpublished data)	P(7;11)
vmr(CHCl ₃)	3.19E-14 - 4.13E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CH ₃ Cl)	4.05E-07 - 4.21E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CH ₃ OH)	1.00E-24 - 2.44E-06 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CO ₂)	7.56E-01 - 7.51E+00 ppmv	WACCM model calc. (Kiefer et al., 2021)	P(20)
vmr(CIO)	2.55E-04 - 6.40E-04 ppmv	preceding V8 retrieval (Glatthor et al., 2024)	G(6)
vmr(HCN)	1.70E-05 - 2.42E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(H ₂ O)	1.45E-01 - 7.31E-01 ppmv	preceding V8 retrieval (Kiefer et al., 2026)	G(6)
vmr(HNO ₃)	5.99E-05 - 4.23E-04 ppmv	preceding V8 retrieval (this paper)	G(6)
vmr(NH ₃)	7.18E-12 - 1.57E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(NO ₂)	1.19E-05 - 2.29E-04 ppmv	preceding V8 retrieval (Funke et al., 2026)	G(6)
vmr(OCS)	7.29E-09 - 3.09E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(acetone)	1.00E-24 - 2.44E-06 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(PAN)	1.00E-24 - 1.52E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CFC-113)	1.26E-10 - 7.79E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(HCFC-22)	3.37E-07 - 7.45E-06 ppmv	database (Kiefer et al., 2002)	P(7;11)
spectroscopic data	15%	May and Friedl (1993)	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: HNO₄ 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)
6	17.23	1.27	0.90	0.60	6.30	1.99	6.86	5.04	10.87	14.84	4.12	15.40
9	16.99	0.71	0.58	0.41	6.01	0.83	3.89	2.95	11.46	13.65	2.61	13.90
12	10.56	0.61	0.58	0.18	7.53	0.41	3.23	1.74	15.40	17.44	1.96	17.55
15	9.70	0.64	0.66	0.22	8.25	0.46	3.22	1.45	20.20	22.05	1.88	22.13
18	18.24	0.88	1.24	0.45	7.72	0.34	5.37	0.94	24.79	26.29	3.94	26.58
21	46.04	1.28	1.87	0.66	6.71	0.30	9.44	0.70	29.01	30.33	7.88	31.33
24	81.89	1.50	2.13	0.92	6.22	0.46	13.24	0.69	33.20	34.36	12.00	36.40
27	96.38	1.38	1.92	1.15	7.51	0.47	14.94	0.73	37.68	38.87	13.99	41.31
30	91.60	1.24	1.64	1.35	12.25	0.39	14.79	0.76	42.11	44.26	13.78	46.36
33	76.52	1.23	1.46	1.59	22.18	0.29	13.90	0.70	46.91	52.30	12.54	53.78
36	52.86	1.31	1.57	1.85	36.44	0.21	13.00	0.63	54.06	65.59	11.16	66.54
39	31.54	1.42	1.90	2.06	53.15	0.29	12.40	0.60	65.68	84.86	10.13	85.46
42	18.46	1.52	2.28	2.19	69.35	0.48	12.10	0.61	79.91	106.13	9.53	106.55
45	11.20	1.60	2.77	2.35	81.26	0.63	11.33	0.64	90.93	122.24	8.66	122.54
48	-24.20	1.67	3.60	2.59	86.98	0.77	10.15	0.70	98.19	131.47	7.00	131.66

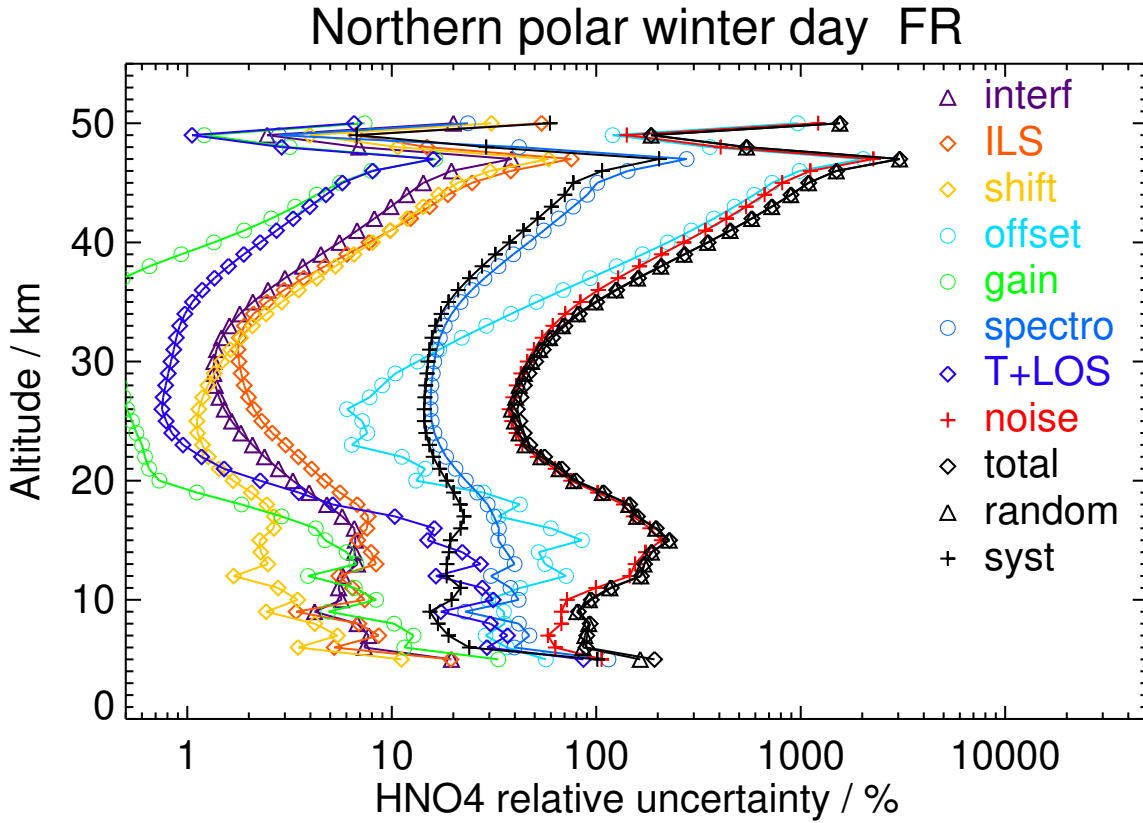


Figure S1: V8H.HNO₄.62 Northern polar winter day

Table S6: HNO₄ 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)
6	8.99	1.21	0.83	0.51	6.14	2.24	8.55	4.57	10.35	13.93	7.22	15.69
9	17.90	0.73	0.46	0.42	7.23	1.12	4.00	2.78	12.80	15.25	3.09	15.56
12	-1.83	0.61	0.55	0.21	7.69	0.28	2.17	1.53	16.02	17.95	1.18	17.99
15	5.63	0.66	0.60	0.18	7.72	0.36	2.84	1.31	20.75	22.33	1.53	22.38
18	13.07	0.92	1.11	0.43	6.58	0.26	4.27	0.99	25.20	26.28	2.98	26.45
21	32.25	1.32	1.75	0.58	5.59	0.24	7.34	0.72	29.57	30.47	6.10	31.07
24	66.80	1.51	2.28	0.91	5.93	0.26	12.18	0.62	33.71	34.92	10.45	36.45
27	85.67	1.39	1.93	1.18	7.46	0.49	14.36	0.70	37.98	39.45	12.50	41.38
30	76.04	1.22	1.61	1.43	11.26	0.44	12.54	0.78	41.86	43.76	11.33	45.20
33	48.40	1.20	1.50	1.71	19.36	0.27	9.58	0.72	45.57	49.74	8.77	50.51
36	14.11	1.28	1.76	1.96	32.28	0.18	7.76	0.61	50.95	60.51	6.78	60.89
39	-3.73	1.40	2.22	2.13	48.63	0.32	7.38	0.56	60.97	78.19	5.96	78.41
42	-5.34	1.52	2.70	2.23	65.39	0.53	7.65	0.58	75.40	100.00	5.86	100.17
45	-4.76	1.61	3.08	2.29	79.64	0.70	7.96	0.63	88.56	119.30	5.95	119.45
48	9.07	1.66	3.46	2.38	88.16	0.78	8.50	0.66	97.96	131.99	6.40	132.14

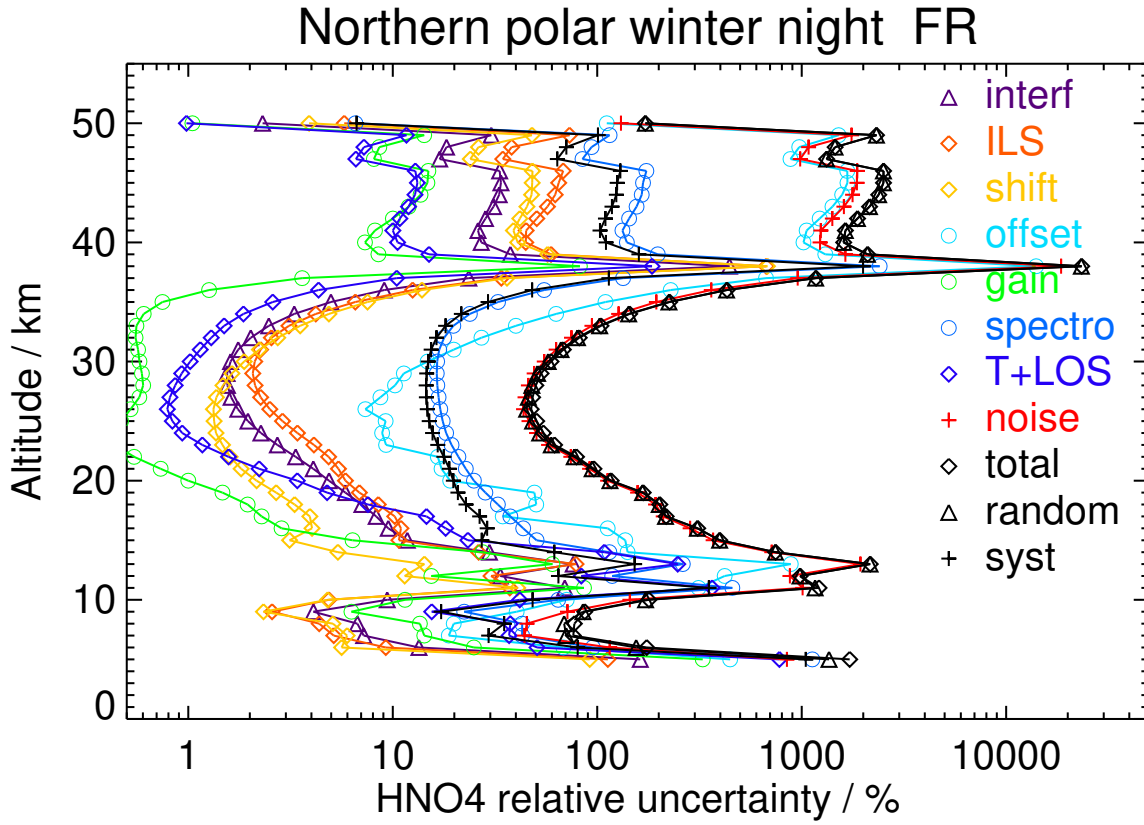


Figure S2: V8H_HNO₄_62 Northern polar winter night

Table S7: HNO4 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)
6	19.80	3.22	1.78	1.78	9.63	5.07	25.86	14.65	16.93	26.46	24.60	36.13
9	39.38	1.27	0.93	0.90	3.64	2.15	9.35	7.06	9.06	13.97	6.73	15.51
12	39.50	0.68	0.59	0.35	4.14	0.53	7.48	3.53	11.56	13.32	6.56	14.85
15	63.48	0.62	1.15	0.18	5.80	0.78	10.03	2.37	16.50	18.02	9.46	20.36
18	99.39	0.78	0.98	0.57	7.23	0.84	15.35	1.79	21.53	23.17	14.84	27.52
21	124.41	1.18	1.52	0.69	7.71	0.86	19.69	1.31	26.12	27.65	19.28	33.71
24	156.25	1.41	2.07	0.87	6.87	1.01	23.66	1.18	30.27	31.60	23.11	39.15
27	148.92	1.28	1.68	1.06	6.68	1.00	23.63	1.19	34.55	35.92	22.69	42.48
30	120.41	1.08	1.20	1.28	7.76	0.77	20.04	1.10	38.87	40.31	18.81	44.48
33	84.76	1.04	0.96	1.55	12.53	0.53	15.24	0.94	43.27	45.53	13.94	47.61
36	48.03	1.09	1.22	1.89	20.92	0.33	11.36	0.74	46.50	51.35	9.92	52.30
39	20.35	1.22	2.04	2.33	33.63	0.24	9.41	0.61	51.23	61.63	7.59	62.09
42	3.12	1.40	3.25	2.81	49.34	0.49	8.92	0.64	61.12	78.88	6.89	79.19
45	-5.48	1.62	4.49	3.20	65.52	0.76	8.99	0.78	73.80	99.01	7.17	99.27
48	-13.03	1.78	5.49	3.42	80.24	1.00	9.20	0.87	88.63	119.86	7.71	120.11
52	-25.11	1.90	6.32	3.54	94.97	1.23	9.41	0.90	103.75	140.93	8.28	141.18

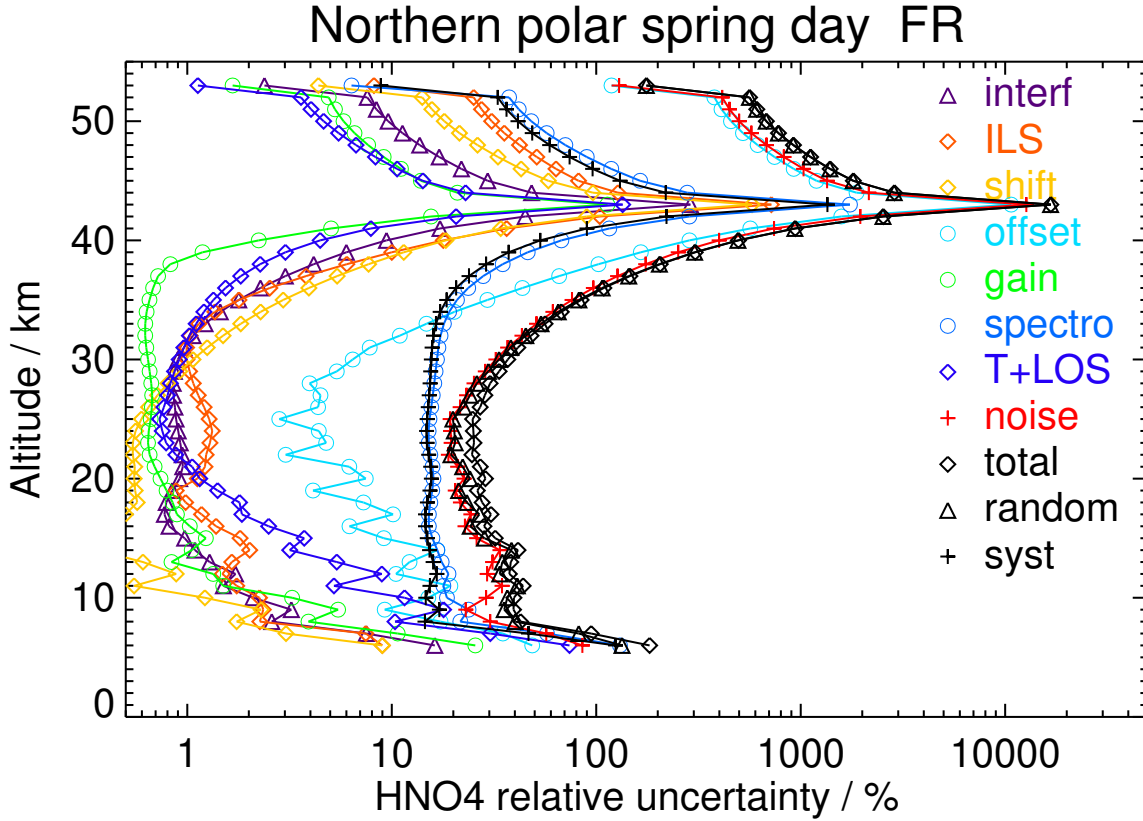


Figure S3: V8H_HNO4.62 Northern polar spring day

Table S8: HNO₄ 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)
6	21.83	3.64	0.07	1.86	9.61	5.98	35.48	17.42	17.56	26.87	35.97	44.89
9	34.73	1.09	1.06	0.79	3.68	2.01	8.73	5.97	8.94	13.40	5.72	14.57
12	40.50	0.64	1.02	0.32	5.15	0.54	8.09	3.18	12.12	14.26	6.89	15.84
15	68.78	0.62	0.98	0.20	7.24	0.92	10.99	2.32	17.38	19.51	10.11	21.98
18	91.81	0.80	1.21	0.58	8.35	0.68	14.87	1.59	22.53	24.62	14.07	28.36
21	136.88	1.20	1.74	0.67	8.17	0.81	21.40	1.14	27.16	29.02	20.66	35.63
24	173.07	1.42	1.99	0.89	7.26	1.15	26.17	1.19	31.05	32.65	25.40	41.37
27	158.15	1.30	1.48	1.05	7.26	1.15	25.11	1.23	35.43	36.89	24.20	44.12
30	121.83	1.13	0.97	1.23	8.75	0.84	20.39	1.13	40.12	41.61	19.41	45.91
33	79.25	1.08	0.77	1.50	13.86	0.54	15.21	0.93	44.33	46.86	14.09	48.93
36	46.18	1.13	1.11	1.88	22.82	0.31	11.49	0.72	47.44	53.01	10.02	53.95
39	29.68	1.25	2.01	2.34	35.87	0.26	9.64	0.60	52.25	63.73	7.75	64.20
42	17.37	1.43	3.28	2.81	51.66	0.53	8.96	0.65	62.21	81.19	7.02	81.49
45	7.28	1.64	4.55	3.19	67.75	0.80	8.77	0.79	74.87	101.27	7.18	101.52
48	-1.37	1.81	5.52	3.40	82.33	1.03	8.75	0.89	89.46	121.85	7.61	122.09
52	-13.09	1.93	6.31	3.52	96.70	1.24	8.85	0.92	104.04	142.29	8.07	142.52

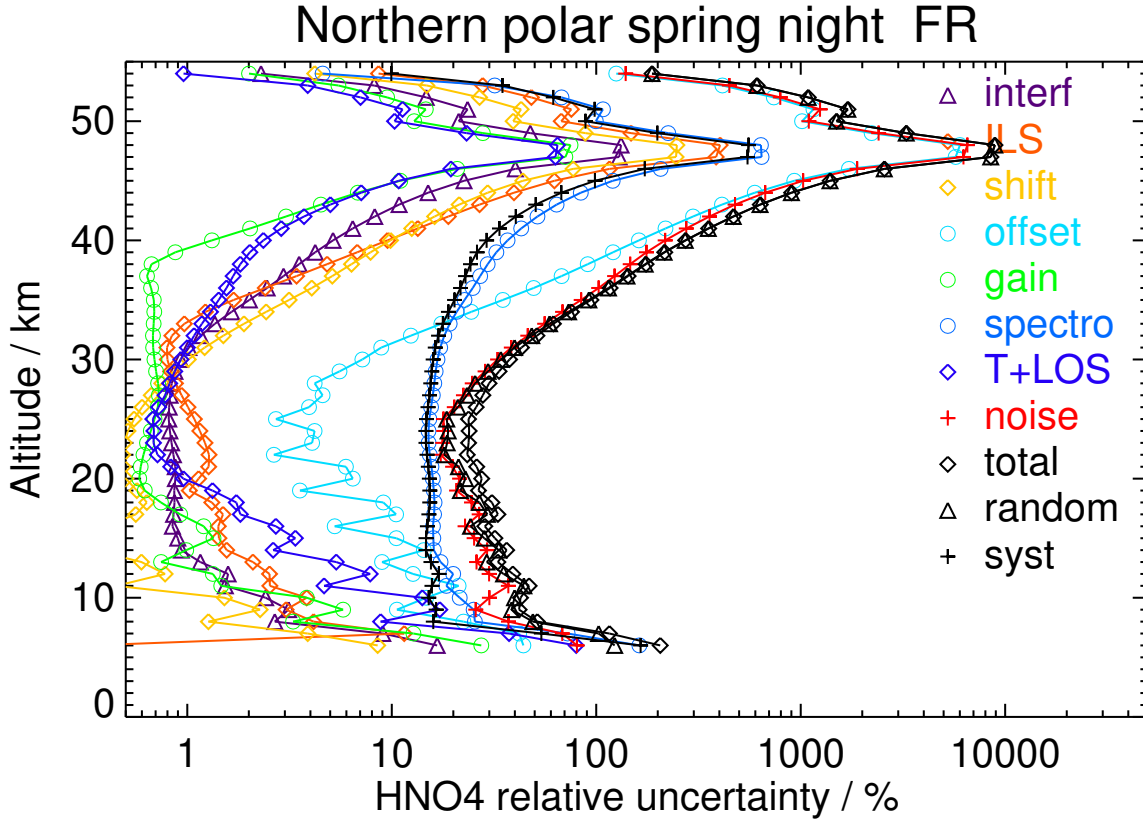


Figure S4: V8H_HNO₄_62 Northern polar spring night

Table S9: HNO₄ 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)
6	58.27	3.60	0.90	2.21	8.53	7.60	36.24	17.53	17.40	26.50	37.01	45.52
9	55.03	1.36	2.69	0.71	6.28	2.56	17.52	5.30	12.26	20.50	10.98	23.26
12	39.47	0.69	1.36	0.29	6.59	1.18	8.40	2.80	13.30	15.94	6.95	17.40
15	42.81	0.58	0.95	0.16	7.13	0.44	7.34	1.57	16.85	18.63	6.73	19.81
18	82.70	0.77	0.60	0.45	7.05	0.52	12.71	1.28	21.02	22.43	12.38	25.62
21	113.69	1.15	1.07	0.53	6.25	0.84	17.45	1.18	25.09	26.23	17.03	31.27
24	117.90	1.41	1.66	0.73	5.34	1.07	19.01	1.11	29.31	30.39	18.25	35.45
27	112.13	1.30	1.42	0.86	5.32	0.92	18.43	1.05	33.57	34.75	17.14	38.74
30	94.77	1.10	0.98	1.09	6.37	0.66	15.59	0.96	38.12	39.20	14.32	41.73
33	67.58	1.02	0.81	1.41	9.76	0.50	11.83	0.83	42.54	43.95	10.85	45.27
36	37.92	1.04	1.18	1.81	15.50	0.37	9.02	0.66	45.71	48.49	8.10	49.17
39	23.24	1.16	2.15	2.27	25.00	0.20	8.16	0.58	48.61	54.93	6.96	55.37
42	20.08	1.37	3.62	2.67	37.93	0.40	8.75	0.68	55.57	67.62	7.32	68.02
45	21.99	1.64	5.13	2.93	52.21	0.70	9.74	0.90	66.03	84.55	8.37	84.96
48	24.45	1.86	6.40	3.01	66.35	0.96	10.65	1.03	80.96	105.05	9.48	105.48
52	26.16	2.01	7.54	3.02	81.48	1.25	11.39	1.07	98.16	127.93	10.51	128.36

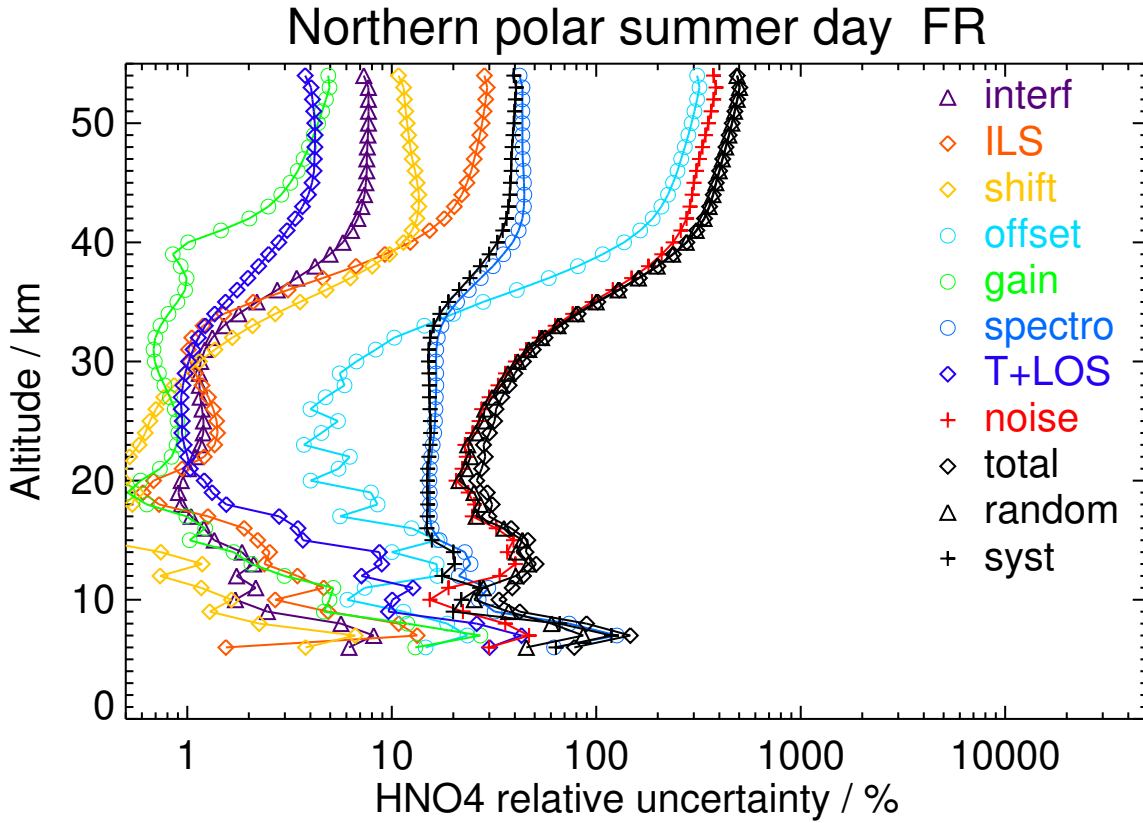


Figure S5: V8H_HNO₄_62 Northern polar summer day

Table S10: HNO₄ 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)
9	46.41	1.65	3.79	0.28	7.55	2.96	20.94	6.23	14.06	19.06	19.86	27.53
12	36.61	0.74	1.76	0.23	6.73	1.54	8.86	3.32	13.58	15.94	8.44	18.04
15	40.58	0.59	1.15	0.16	6.80	0.32	7.47	1.55	16.90	18.49	7.07	19.79
18	78.69	0.79	0.80	0.33	6.32	0.63	12.24	1.33	20.83	22.09	11.81	25.05
21	119.02	1.16	1.11	0.48	5.28	0.69	18.08	1.13	25.06	26.06	17.56	31.43
24	132.67	1.43	1.69	0.70	4.27	1.07	20.93	1.11	29.50	30.37	20.29	36.53
27	129.04	1.32	1.52	0.89	4.76	0.96	20.72	1.07	34.20	35.08	19.94	40.35
30	120.78	1.13	1.15	1.13	6.64	0.73	18.53	1.00	39.09	40.04	17.83	43.83
33	94.37	1.06	0.90	1.45	10.55	0.56	15.04	0.92	43.41	44.93	14.43	47.19
36	59.73	1.09	1.15	1.86	17.32	0.39	11.82	0.75	46.27	49.66	11.03	50.87
39	36.87	1.20	2.01	2.32	27.95	0.21	10.19	0.64	49.59	57.24	8.89	57.93
42	26.84	1.39	3.32	2.75	41.75	0.35	10.09	0.69	57.87	71.75	8.26	72.22
45	23.27	1.64	4.63	3.07	56.51	0.63	10.58	0.88	69.80	90.22	8.53	90.62
48	21.52	1.83	5.71	3.20	70.52	0.87	11.11	1.00	84.63	110.57	9.08	110.94
52	17.16	1.95	6.61	3.24	84.87	1.13	11.49	1.03	100.59	131.99	9.63	132.34

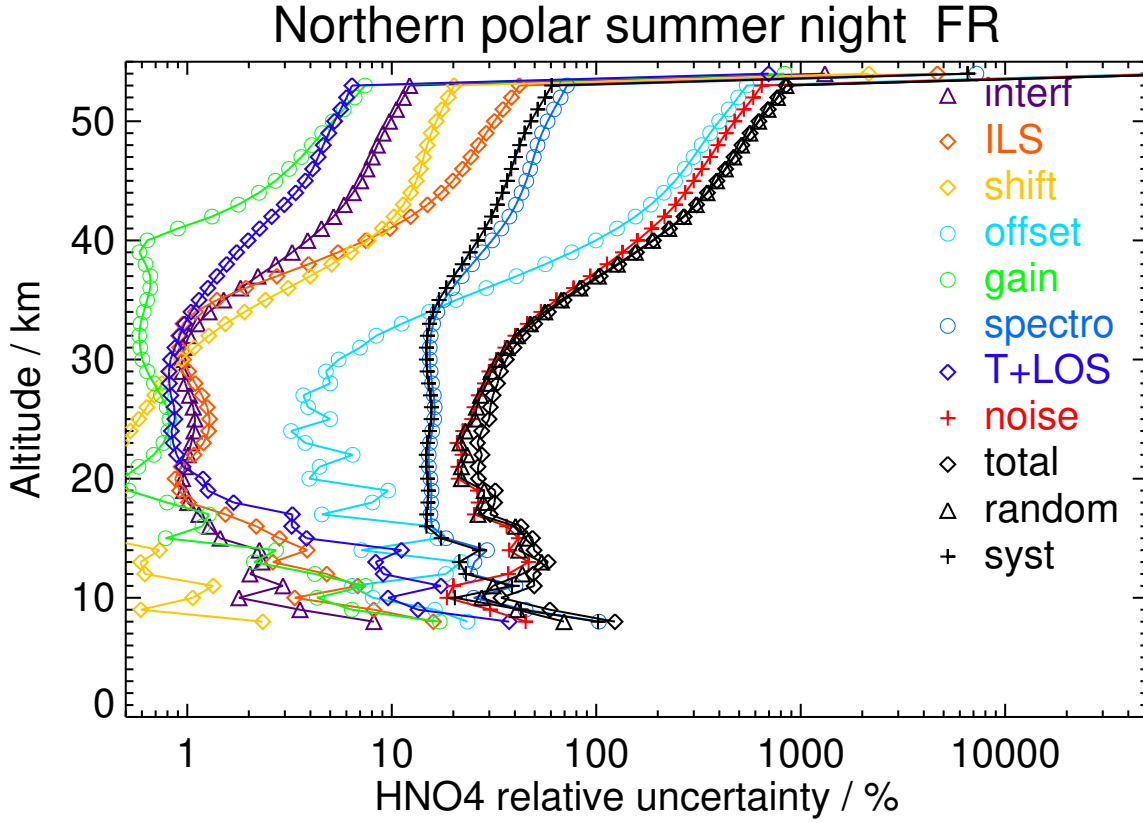


Figure S6: V8H.HNO₄.62 Northern polar summer night

Table S11: HNO₄ 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)
6	-9.21	2.96	0.91	1.91	8.78	7.44	24.35	14.85	15.94	25.66	23.56	34.83
9	28.99	1.56	0.82	1.32	5.02	3.49	11.50	8.38	10.79	16.65	9.16	19.00
12	12.38	0.72	0.51	0.48	3.82	1.02	6.25	3.84	10.58	12.43	5.28	13.51
15	21.99	0.60	0.56	0.13	3.73	0.80	4.23	2.16	14.19	15.10	3.34	15.46
18	38.24	0.82	1.03	0.45	3.78	0.39	6.84	1.51	19.10	19.80	6.17	20.74
21	62.13	1.26	1.03	0.58	4.31	0.43	10.10	0.86	25.31	26.05	9.27	27.66
24	80.34	1.51	1.48	0.79	5.34	0.45	12.68	0.77	31.61	32.38	12.08	34.56
27	81.73	1.40	1.29	0.94	7.83	0.46	13.61	0.78	38.07	39.23	12.72	41.24
30	74.86	1.26	0.95	1.07	15.08	0.41	13.05	0.78	43.99	46.89	11.74	48.34
33	52.55	1.26	0.82	1.26	27.54	0.29	11.42	0.75	49.67	57.12	9.91	57.97
36	27.15	1.34	1.07	1.49	44.23	0.23	9.95	0.68	57.15	72.53	8.19	72.99
39	-0.57	1.45	1.59	1.72	63.00	0.37	9.41	0.67	68.15	93.06	7.13	93.33
42	-25.27	1.56	2.19	1.91	81.28	0.58	9.53	0.72	81.90	115.64	6.70	115.83
45	-39.89	1.66	2.72	2.06	96.98	0.75	9.81	0.80	94.79	135.87	6.61	136.03
48	-62.66	1.74	3.23	2.24	107.34	0.86	9.76	0.83	104.13	149.81	6.03	149.93

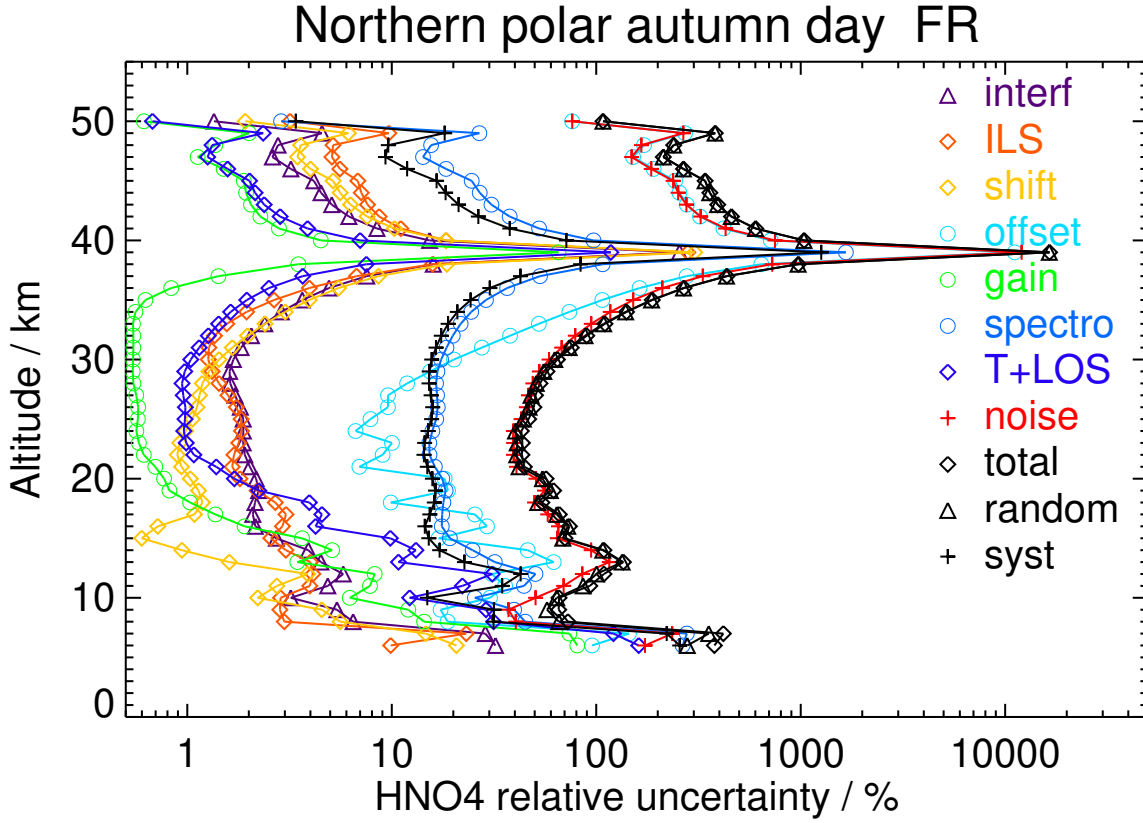


Figure S7: V8H_HNO₄_62 Northern polar autumn day

Table S12: HNO₄ 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)
6	-5.23	2.90	0.79	1.67	8.38	6.23	23.12	13.88	15.07	23.16	23.21	32.79
9	22.87	1.55	0.66	1.11	4.18	3.25	11.32	8.48	9.67	14.52	10.71	18.04
12	3.54	0.74	0.49	0.39	3.76	1.00	6.15	3.83	10.48	12.14	5.55	13.35
15	18.57	0.62	0.49	0.10	3.98	0.73	3.74	2.20	14.53	15.47	2.73	15.71
18	24.64	0.84	1.17	0.47	4.57	0.43	5.55	1.54	20.05	20.97	4.34	21.42
21	46.24	1.29	1.40	0.58	5.55	0.35	8.65	0.77	26.36	27.37	7.49	28.38
24	80.40	1.54	1.63	0.76	6.29	0.35	12.96	0.70	32.43	33.58	11.73	35.57
27	90.07	1.42	1.30	0.90	8.31	0.48	15.27	0.76	38.57	40.11	13.62	42.36
30	80.30	1.27	0.94	1.07	14.98	0.46	15.24	0.78	44.16	47.30	13.19	49.10
33	63.73	1.26	0.87	1.31	26.72	0.37	14.34	0.73	49.55	56.91	11.85	58.13
36	53.19	1.34	1.10	1.58	42.71	0.30	13.80	0.66	56.48	71.39	10.72	72.19
39	46.08	1.44	1.57	1.84	61.05	0.36	13.75	0.66	66.97	91.15	10.08	91.71
42	44.27	1.55	2.15	2.06	79.26	0.52	13.96	0.73	80.69	113.59	9.87	114.01
45	46.49	1.65	2.66	2.22	94.99	0.69	14.19	0.81	93.70	133.88	9.85	134.24
48	32.82	1.73	3.35	2.42	104.55	0.85	12.24	0.88	102.64	146.87	8.02	147.09

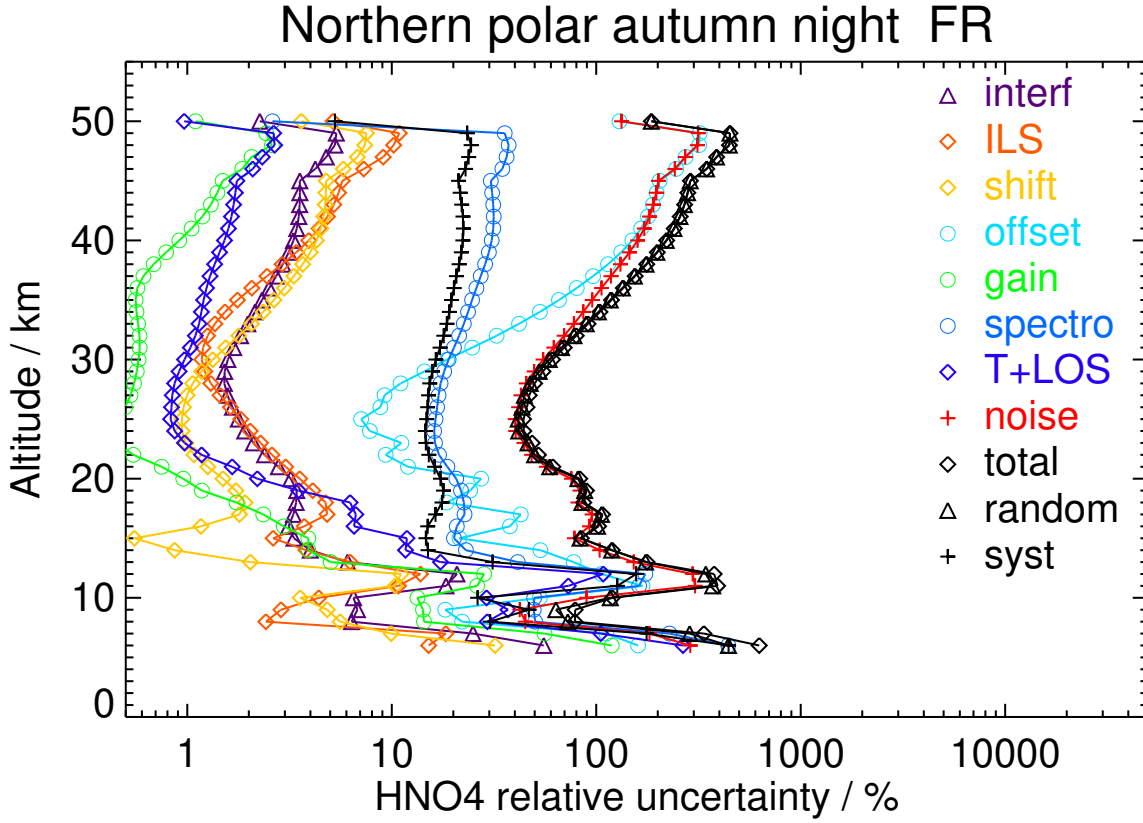


Figure S8: V8H.HNO₄.62 Northern polar autumn night

Table S13: HNO₄ error budget for Northern midlatitude winter day. All uncertainties are 1 σ .

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)
6	11.03	0.91	0.46	0.56	5.77	2.10	7.97	3.91	9.74	12.88	6.84	14.58
9	21.11	0.67	0.62	0.46	6.78	0.96	4.84	2.57	11.98	14.52	3.30	14.89
12	9.42	0.60	0.63	0.17	7.80	0.38	3.44	1.31	15.05	17.26	2.00	17.38
15	10.38	0.62	0.67	0.19	8.63	0.41	3.33	1.19	19.64	21.68	1.97	21.77
18	29.13	0.84	1.35	0.46	8.29	0.26	6.44	0.84	23.94	25.69	5.22	26.21
21	70.69	1.24	2.07	0.65	7.17	0.40	11.90	0.73	28.05	29.43	10.98	31.42
24	110.00	1.49	2.27	0.87	6.31	0.59	16.76	0.81	32.47	33.55	16.08	37.21
27	117.23	1.38	1.74	1.05	6.85	0.68	18.38	0.87	37.24	38.38	17.50	42.18
30	105.29	1.21	1.27	1.24	10.38	0.56	16.95	0.88	41.81	43.54	15.91	46.36
33	79.28	1.18	1.12	1.54	18.03	0.41	14.62	0.78	45.62	49.49	13.29	51.25
36	56.59	1.25	1.38	1.90	30.07	0.28	12.93	0.65	50.06	58.84	11.06	59.87
39	35.79	1.38	1.93	2.25	45.54	0.29	12.22	0.59	59.06	75.02	9.74	75.65
42	22.43	1.51	2.58	2.56	61.74	0.48	12.12	0.62	73.02	96.03	9.19	96.47
45	14.00	1.63	3.09	2.76	76.16	0.65	12.20	0.69	86.30	115.48	9.01	115.83
48	6.41	1.70	3.51	2.87	86.15	0.80	12.11	0.71	96.93	130.04	8.85	130.34

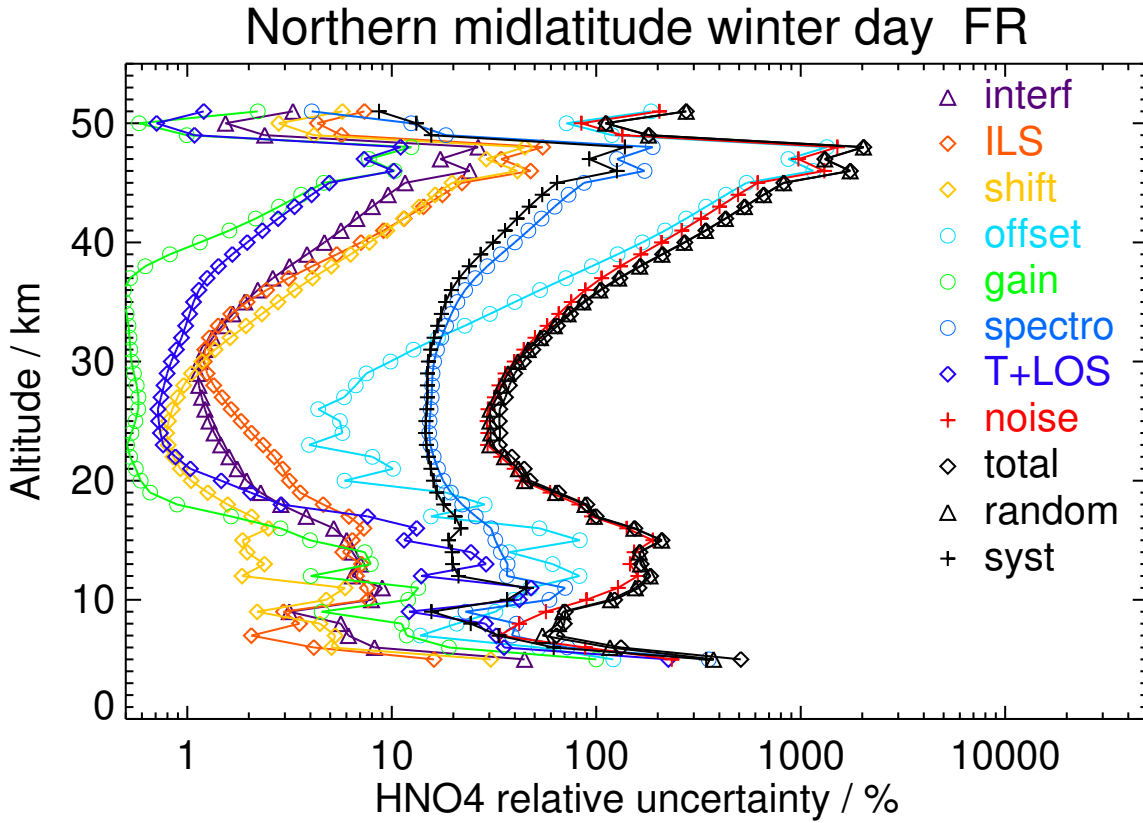


Figure S9: V8H_HNO₄.62 Northern midlatitude winter day

Table S14: HNO₄ 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)
6	0.95	2.26	1.30	1.21	7.18	3.76	20.33	10.37	13.15	19.93	19.26	27.71
9	22.60	1.15	0.81	0.90	6.40	1.80	10.02	5.92	12.25	15.98	8.78	18.24
12	5.06	0.65	0.41	0.32	5.74	0.54	4.52	2.38	13.24	14.87	3.79	15.34
15	13.43	0.61	0.52	0.12	5.71	0.46	3.15	1.51	16.97	18.13	2.26	18.27
18	31.72	0.82	1.45	0.48	5.10	0.27	6.37	1.10	20.91	21.79	5.79	22.55
21	81.03	1.17	2.09	0.69	4.46	0.32	12.61	0.78	25.28	25.95	12.31	28.72
24	129.33	1.42	2.48	0.92	4.19	0.58	19.30	0.81	29.78	30.51	18.88	35.88
27	143.21	1.33	1.95	1.08	5.59	0.82	21.49	0.93	35.46	36.48	20.69	41.94
30	117.48	1.19	1.37	1.24	9.39	0.69	18.91	0.99	40.80	42.37	17.92	46.01
33	72.01	1.17	1.13	1.49	17.17	0.44	14.73	0.88	45.48	49.00	13.60	50.86
36	43.24	1.25	1.33	1.83	29.26	0.25	11.60	0.68	49.95	58.21	10.20	59.10
39	26.44	1.37	1.87	2.18	44.69	0.28	10.05	0.57	58.10	73.59	8.30	74.06
42	17.59	1.50	2.54	2.47	61.11	0.49	9.56	0.58	71.41	94.26	7.48	94.56
45	10.49	1.62	3.07	2.67	75.81	0.67	9.47	0.64	84.91	114.08	7.20	114.30
48	4.39	1.70	3.41	2.75	88.04	0.81	9.48	0.68	97.07	131.29	7.12	131.48

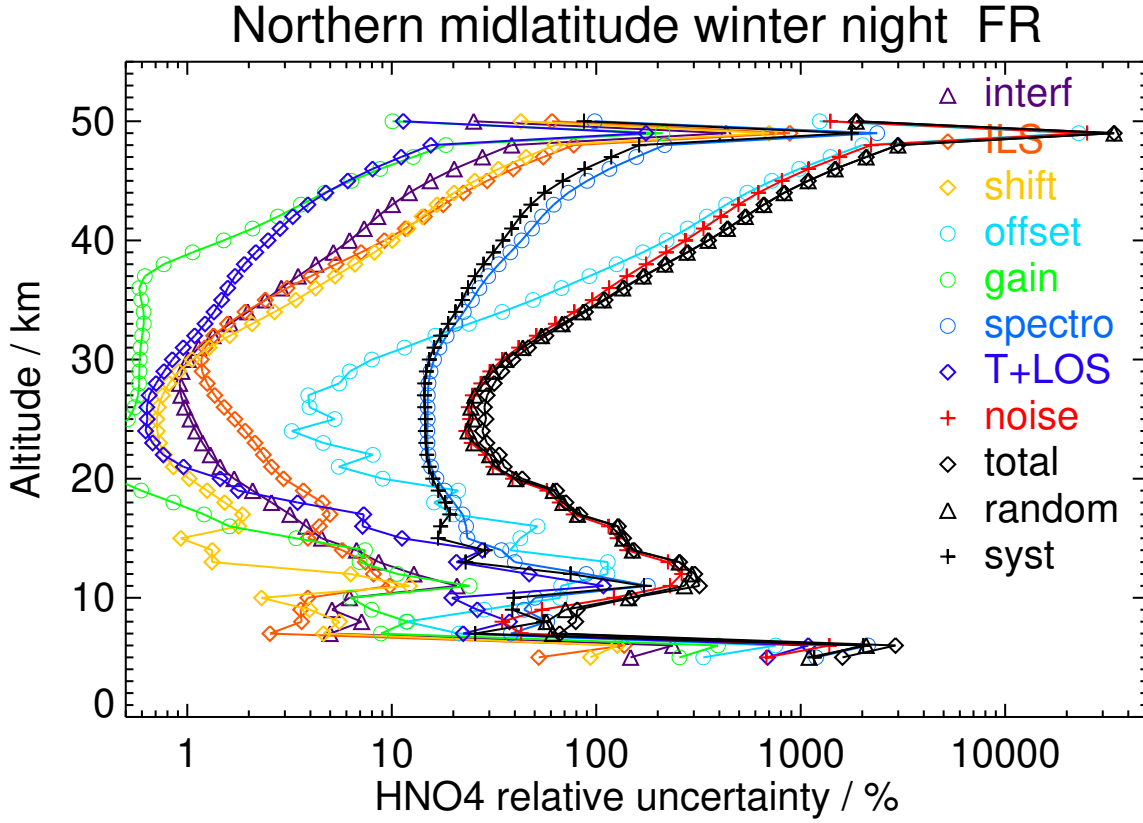


Figure S10: V8H_HNO₄.62 Northern midlatitude winter night

Table S15: HNO₄ 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)
6	-15.79	3.08	1.14	1.86	9.46	6.37	23.58	15.33	16.58	25.06	24.13	34.79
9	53.03	1.38	0.94	1.21	3.58	2.64	10.69	7.51	9.08	13.84	9.26	16.65
12	33.87	0.74	0.70	0.49	4.84	0.69	7.55	3.71	11.55	13.70	6.44	15.14
15	44.10	0.62	1.09	0.13	6.59	0.75	7.67	2.27	16.36	18.31	6.48	19.42
18	87.82	0.81	1.33	0.43	7.91	0.53	14.26	1.41	22.08	23.98	13.52	27.53
21	143.18	1.24	1.66	0.60	7.96	0.83	22.26	1.17	27.10	28.72	21.80	36.06
24	186.36	1.47	1.87	0.80	6.77	1.24	28.18	1.28	31.56	32.87	27.66	42.96
27	184.28	1.35	1.22	0.97	6.84	1.28	28.33	1.36	35.81	37.16	27.55	46.25
30	144.98	1.15	0.73	1.18	8.52	0.95	23.13	1.34	40.36	41.75	22.35	47.35
33	85.97	1.07	0.79	1.54	13.50	0.56	16.16	1.15	44.39	46.67	15.54	49.19
36	31.99	1.12	1.34	2.02	21.87	0.26	10.63	0.86	46.99	52.03	10.02	52.98
39	4.45	1.24	2.42	2.56	34.16	0.23	8.34	0.67	51.20	61.81	7.22	62.23
42	-2.14	1.45	3.78	3.07	49.54	0.50	8.63	0.72	60.77	78.75	6.78	79.05
45	-4.13	1.67	5.01	3.40	65.55	0.75	9.62	0.86	73.59	98.95	7.36	99.22
48	-2.85	1.83	5.91	3.55	79.96	0.96	10.47	0.93	88.25	119.49	8.03	119.76
52	0.76	1.93	6.59	3.59	94.21	1.17	11.10	0.94	103.09	140.06	8.60	140.32

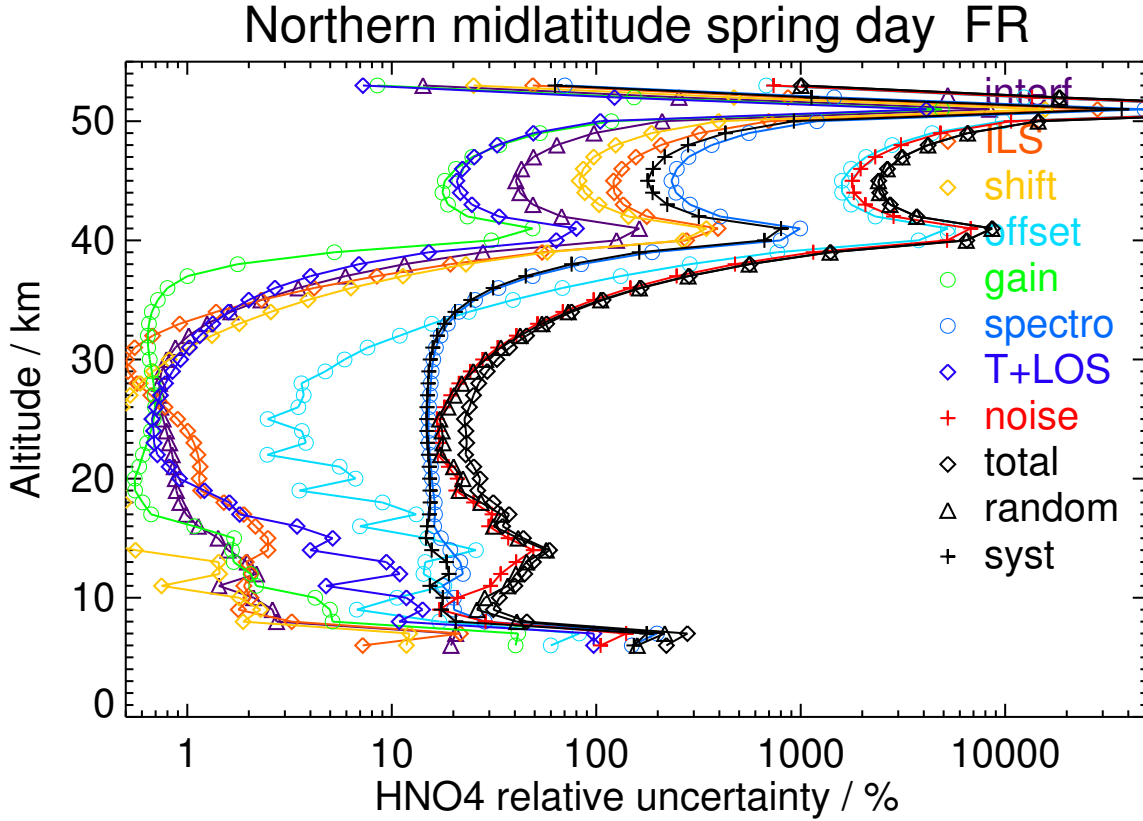


Figure S11: V8H_HNO₄_62 Northern midlatitude spring day

Table S16: HNO₄ 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)
9	47.50	1.09	1.05	1.02	3.69	2.73	11.65	5.84	8.67	14.27	8.12	16.41
12	38.86	0.64	0.96	0.39	5.60	0.63	8.09	3.00	12.00	14.45	6.54	15.86
15	52.71	0.60	0.95	0.17	7.45	0.79	8.76	2.13	17.01	19.21	7.67	20.69
18	90.93	0.78	1.31	0.46	8.69	0.47	14.68	1.27	22.24	24.36	14.03	28.11
21	160.00	1.19	1.98	0.59	8.74	0.86	24.05	1.12	27.06	28.79	23.79	37.35
24	204.99	1.43	2.03	0.85	7.22	1.33	30.67	1.32	31.08	32.31	30.42	44.37
27	205.80	1.32	1.36	1.03	7.18	1.35	30.89	1.44	35.45	36.63	30.47	47.65
30	157.43	1.14	0.75	1.21	8.59	0.98	25.41	1.41	40.14	41.51	24.77	48.34
33	97.66	1.07	0.61	1.50	13.18	0.63	18.15	1.17	44.28	46.61	17.23	49.69
36	47.39	1.11	1.11	1.97	21.25	0.36	12.24	0.86	46.84	51.77	11.06	52.94
39	9.50	1.23	2.18	2.57	33.30	0.23	8.91	0.67	50.69	60.95	7.51	61.41
42	-12.90	1.44	3.57	3.17	48.44	0.47	7.77	0.69	60.17	77.54	6.37	77.80
45	-28.30	1.67	4.82	3.56	64.32	0.73	7.71	0.83	72.75	97.40	6.51	97.61
48	-39.40	1.83	5.72	3.73	78.68	0.95	7.97	0.91	87.58	118.02	6.96	118.22
52	-51.02	1.93	6.39	3.77	92.82	1.16	8.26	0.90	102.41	138.48	7.39	138.68

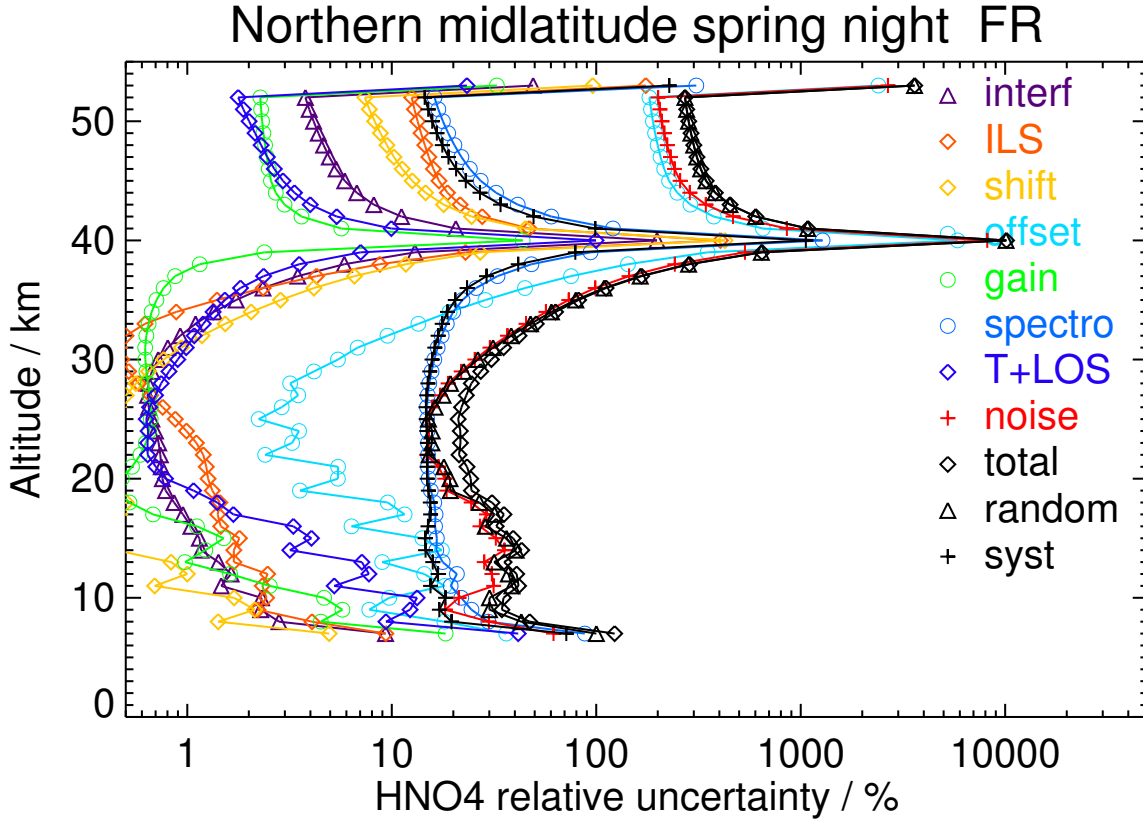


Figure S12: V8H_HNO₄.62 Northern midlatitude spring night

Table S17: HNO₄ 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)
9	49.38	1.19	2.32	0.47	6.48	2.13	14.60	3.70	11.83	16.91	11.59	20.50
12	40.61	0.75	1.44	0.30	7.85	1.22	8.46	2.19	14.54	17.54	6.77	18.80
15	20.38	0.62	1.06	0.17	8.72	0.42	5.33	1.31	18.99	21.28	3.93	21.64
18	51.15	0.83	1.24	0.21	8.20	0.29	8.89	0.97	23.18	24.92	8.12	26.21
21	116.90	1.21	2.14	0.49	6.63	0.36	19.05	0.92	26.68	27.80	18.79	33.55
24	209.47	1.45	2.52	0.74	5.63	1.12	30.50	1.12	30.43	31.24	30.38	43.58
27	238.89	1.32	1.55	1.02	5.94	1.49	34.72	1.48	34.47	35.26	34.58	49.39
30	192.93	1.11	0.64	1.27	6.95	1.23	29.78	1.61	38.73	39.62	29.55	49.43
33	119.14	1.03	0.57	1.57	10.63	0.81	21.14	1.38	42.87	44.48	20.62	49.03
36	55.97	1.07	1.21	2.00	17.08	0.48	13.87	0.99	45.57	49.01	12.90	50.68
39	29.54	1.19	2.21	2.50	27.65	0.24	9.63	0.71	48.69	56.31	8.39	56.93
42	8.98	1.38	3.41	2.94	41.61	0.47	7.78	0.71	57.34	71.12	6.67	71.44
45	-2.49	1.60	4.52	3.23	56.59	0.77	7.17	0.87	69.50	89.87	6.54	90.11
48	-8.19	1.76	5.38	3.32	70.60	1.02	6.96	0.95	84.89	110.62	6.88	110.84
52	-12.02	1.85	6.07	3.29	84.59	1.26	6.81	0.93	100.62	131.63	7.26	131.83

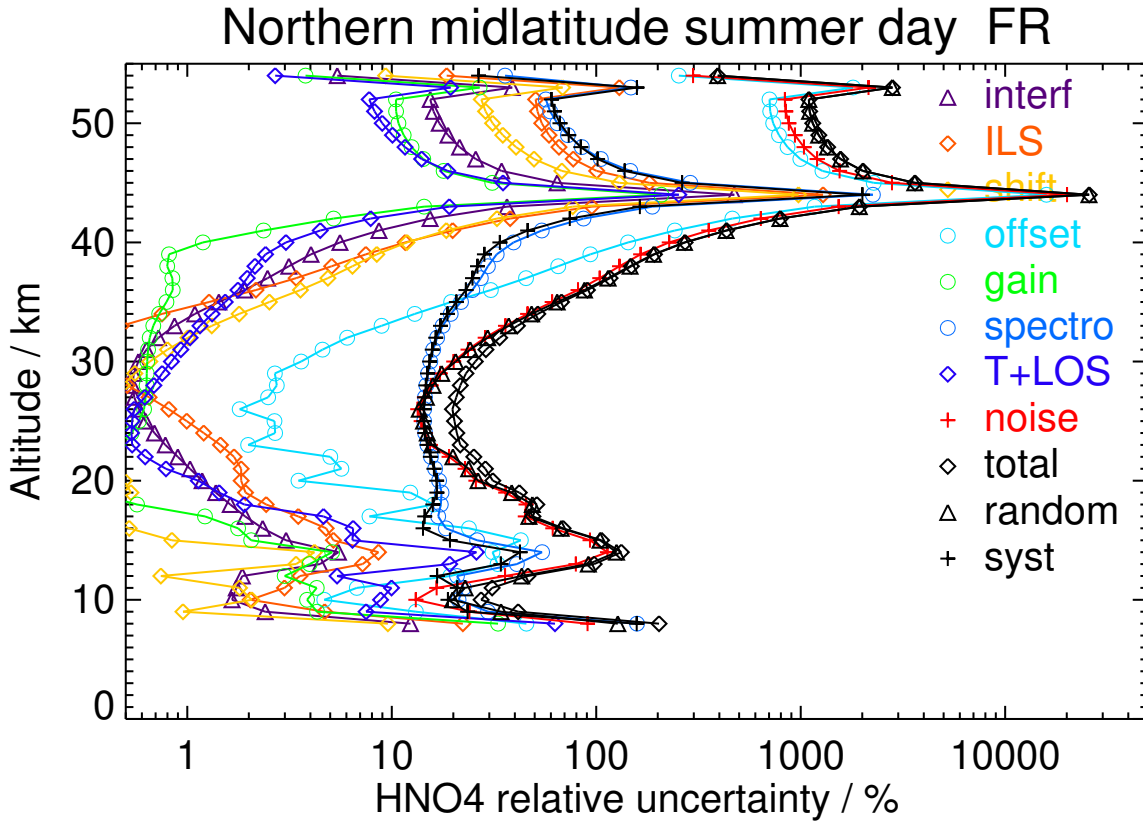


Figure S13: V8H_HNO₄_62 Northern midlatitude summer day

Table S18: HNO₄ 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)
9	43.32	1.57	3.10	0.45	7.21	3.01	22.88	6.52	13.89	18.95	21.75	28.85
12	45.06	0.81	1.47	0.48	7.44	1.29	10.14	3.30	14.54	17.46	8.97	19.63
15	20.69	0.60	1.07	0.23	7.53	0.34	5.92	1.55	17.93	19.84	4.88	20.43
18	54.96	0.83	1.36	0.16	6.44	0.42	9.12	1.18	22.01	23.34	8.25	24.76
21	114.13	1.20	1.98	0.46	4.90	0.40	18.42	0.95	26.08	26.93	18.03	32.41
24	195.08	1.45	2.37	0.72	4.41	0.99	28.81	1.08	30.39	31.06	28.62	42.23
27	234.70	1.33	1.71	1.01	5.00	1.38	33.73	1.36	34.59	35.38	33.42	48.67
30	200.81	1.14	0.85	1.25	7.03	1.20	30.37	1.57	39.42	40.53	29.84	50.33
33	127.48	1.07	0.64	1.55	11.08	0.85	22.60	1.41	43.58	45.40	21.86	50.39
36	70.25	1.10	1.12	1.98	18.24	0.53	15.42	1.05	46.42	50.23	14.48	52.28
39	34.59	1.22	2.03	2.48	29.34	0.27	11.06	0.79	49.92	58.23	9.83	59.06
42	14.64	1.41	3.22	2.94	43.40	0.36	9.36	0.78	59.15	73.69	7.85	74.11
45	3.85	1.63	4.26	3.26	58.18	0.60	9.10	0.96	71.64	92.61	7.50	92.91
48	-0.25	1.77	5.07	3.36	71.83	0.84	9.21	1.04	86.47	112.72	7.65	112.98
52	3.07	1.86	5.69	3.33	85.15	1.10	9.29	1.01	101.23	132.56	7.83	132.79

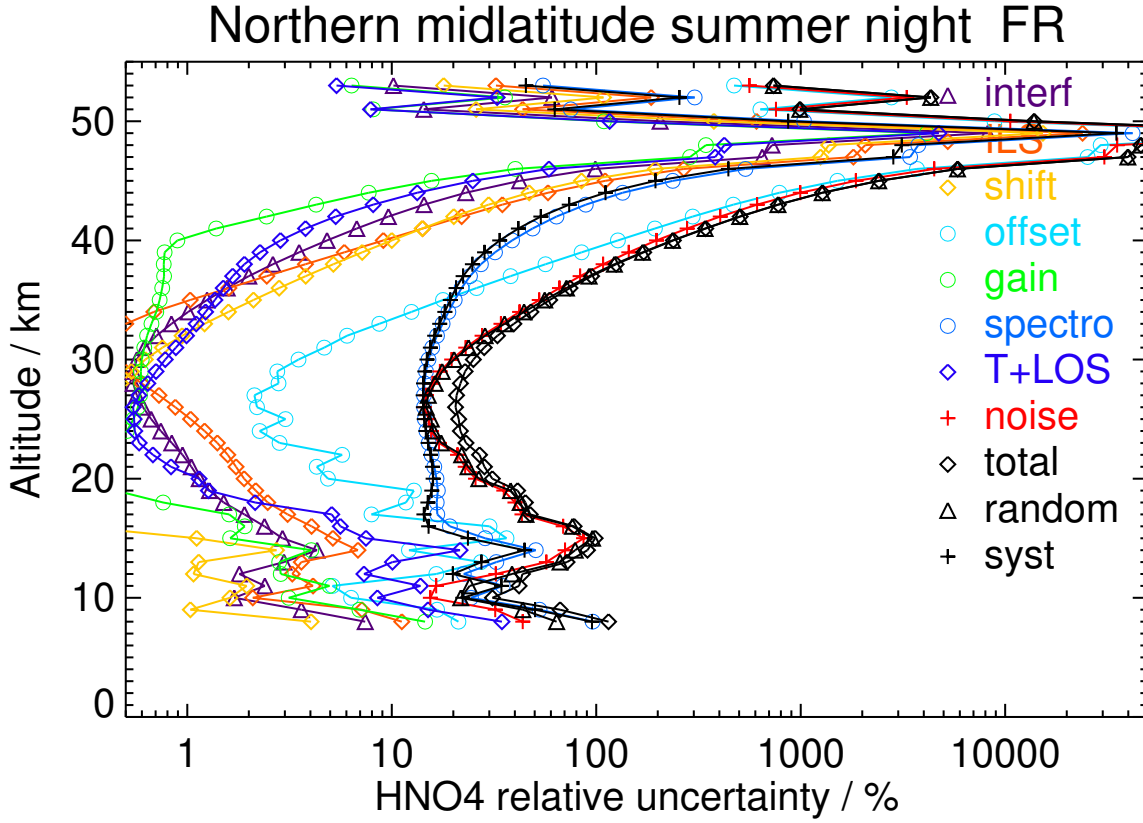


Figure S14: V8H_HNO₄.62 Northern midlatitude summer night

Table S19: HNO₄ 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)
9	25.20	1.90	3.49	0.96	9.17	2.59	17.30	7.31	15.34	23.45	12.07	26.38
12	20.41	0.91	1.66	0.53	6.70	1.02	7.23	4.34	13.11	16.38	4.96	17.11
15	20.25	0.64	1.16	0.23	5.57	0.33	6.01	2.19	16.02	17.43	5.18	18.18
18	42.33	0.86	1.15	0.25	4.26	0.51	7.59	1.42	20.54	21.39	6.69	22.41
21	89.30	1.25	1.90	0.51	3.66	0.33	14.81	0.87	25.38	26.13	14.17	29.72
24	151.63	1.46	2.20	0.80	4.11	0.75	22.75	0.90	30.12	30.95	22.20	38.09
27	177.94	1.29	1.71	1.04	5.42	1.07	26.53	1.07	34.68	35.70	25.87	44.09
30	160.73	1.11	1.05	1.25	8.37	0.97	24.77	1.17	39.96	41.36	23.99	47.82
33	118.12	1.09	0.76	1.51	14.64	0.68	20.10	1.08	44.22	47.04	19.14	50.79
36	75.51	1.16	1.04	1.86	25.20	0.39	15.68	0.86	47.83	54.48	14.41	56.35
39	42.52	1.29	1.75	2.25	39.85	0.25	13.21	0.70	53.90	67.45	11.31	68.39
42	26.08	1.45	2.70	2.61	56.68	0.44	12.65	0.67	65.59	87.14	9.92	87.71
45	19.61	1.62	3.55	2.89	72.84	0.66	12.92	0.75	79.18	108.05	9.55	108.47
48	17.61	1.75	4.20	3.03	86.99	0.84	13.35	0.82	92.64	127.54	9.56	127.90
52	36.60	1.85	4.94	3.17	98.91	1.01	16.25	0.85	104.57	144.56	11.15	144.99

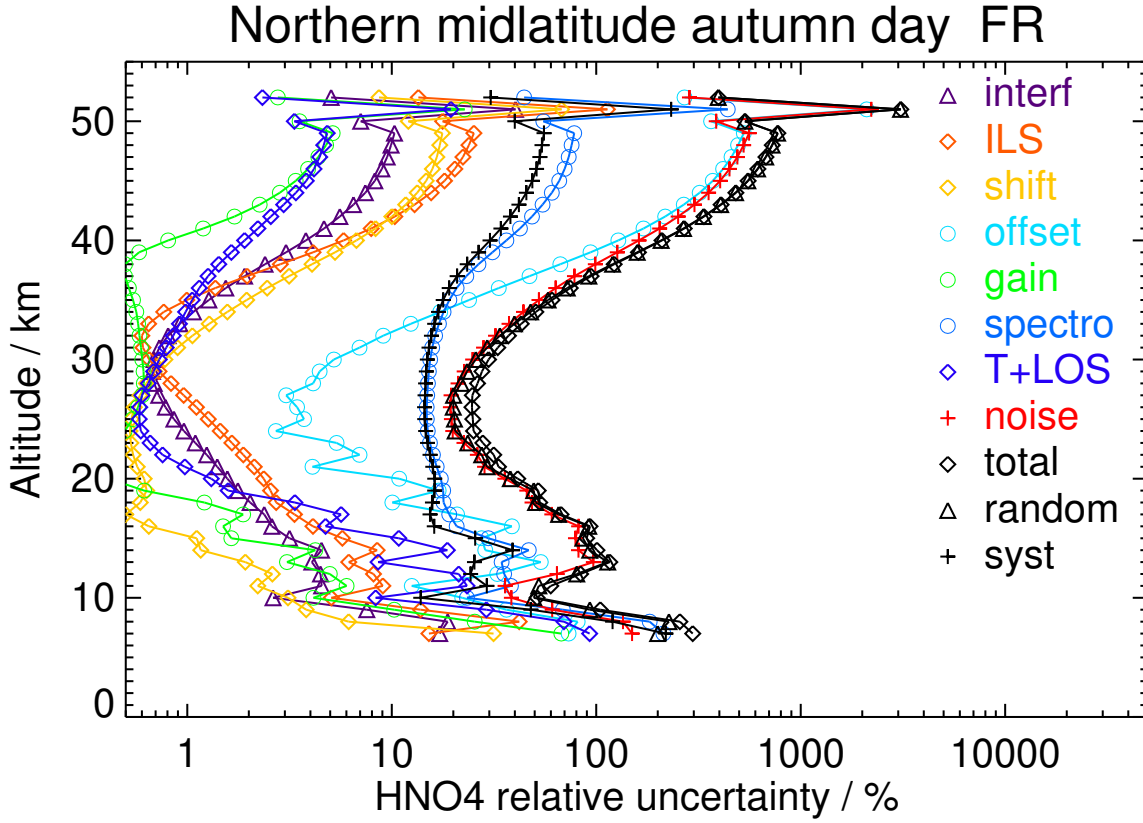


Figure S15: V8H.HNO₄.62 Northern midlatitude autumn day

Table S20: HNO₄ 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)
6	-17.22	3.03	1.47	2.64	8.32	8.15	36.47	16.08	16.51	26.19	36.47	44.89
9	39.22	1.71	1.97	1.28	6.06	3.36	16.85	8.00	11.80	22.22	7.09	23.32
12	16.74	0.76	1.22	0.45	4.81	1.32	7.17	3.95	11.09	14.27	3.67	14.74
15	19.98	0.60	0.62	0.16	4.86	0.51	4.33	2.12	14.94	16.19	2.96	16.46
18	41.78	0.82	1.45	0.31	5.12	0.42	7.62	1.41	20.12	21.07	7.09	22.23
21	92.80	1.24	1.90	0.50	4.93	0.28	14.75	0.82	25.62	26.35	14.49	30.07
24	157.90	1.46	2.05	0.80	4.98	0.70	23.06	0.90	30.51	31.37	22.62	38.67
27	169.11	1.31	1.58	1.04	6.13	1.03	25.50	1.12	35.49	36.63	24.76	44.22
30	136.64	1.13	1.07	1.24	9.44	0.88	22.77	1.17	40.69	42.42	21.67	47.64
33	94.67	1.11	0.89	1.50	16.21	0.60	18.45	1.00	45.01	48.41	17.06	51.33
36	74.14	1.18	1.16	1.84	27.34	0.37	15.35	0.77	48.81	56.45	13.61	58.07
39	62.15	1.31	1.77	2.21	42.27	0.27	13.93	0.64	55.30	70.09	11.67	71.06
42	46.30	1.46	2.58	2.55	59.03	0.39	13.52	0.64	67.23	89.94	10.72	90.58
45	33.85	1.62	3.34	2.79	74.95	0.56	13.49	0.72	80.79	110.65	10.32	111.13
48	28.06	1.74	3.91	2.92	88.80	0.72	13.56	0.79	93.61	129.45	10.18	129.85
52	152.77	1.91	5.59	3.21	96.67	0.89	21.88	0.90	103.58	142.30	18.69	143.52

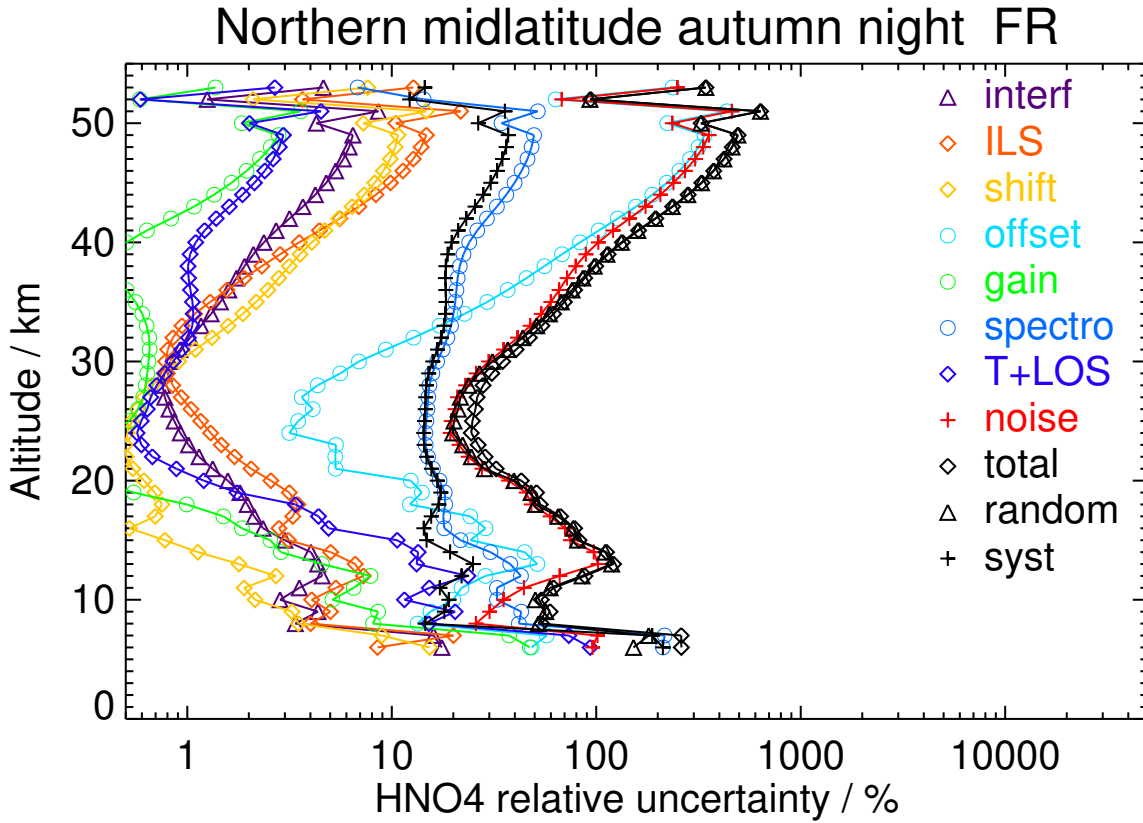


Figure S16: V8H_HNO₄_62 Northern midlatitude autumn night

Table S21: HNO₄ 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)
9	21.49	1.34	1.56	3.26	4.05	3.44	13.76	5.19	9.84	15.07	11.38	18.88
12	15.60	0.90	2.27	1.47	5.56	2.01	8.49	3.14	11.94	15.75	4.44	16.36
15	6.90	0.73	1.44	0.45	7.33	0.94	5.27	2.16	18.52	20.47	3.70	20.80
18	5.77	0.92	0.91	0.27	9.09	0.91	4.92	1.09	26.70	28.47	3.61	28.70
21	45.81	1.34	2.47	0.47	7.53	0.18	10.52	0.83	28.62	29.82	10.29	31.55
24	141.69	1.53	3.16	0.74	6.24	0.43	21.33	0.84	31.45	32.38	21.17	38.68
27	206.88	1.34	2.36	1.03	6.32	0.81	28.93	1.02	35.03	35.95	28.65	45.97
30	194.42	1.12	1.26	1.30	7.90	0.84	28.43	1.30	39.33	40.54	27.95	49.24
33	132.90	1.04	0.88	1.58	12.21	0.65	22.51	1.25	43.49	45.59	21.81	50.54
36	77.20	1.08	1.22	1.99	19.80	0.44	16.15	0.97	46.02	50.47	15.19	52.71
39	38.65	1.21	2.15	2.51	31.50	0.31	11.68	0.76	49.73	59.18	10.60	60.12
42	12.63	1.41	3.35	2.99	46.51	0.48	9.29	0.80	58.91	75.32	8.37	75.78
45	-5.74	1.61	4.44	3.25	62.33	0.76	8.22	0.94	72.32	95.70	7.64	96.00
48	-15.58	1.76	5.24	3.33	76.27	1.04	7.71	0.99	87.10	115.98	7.48	116.22
52	-18.35	1.84	5.89	3.30	89.77	1.39	7.54	0.97	101.74	135.87	7.61	136.08

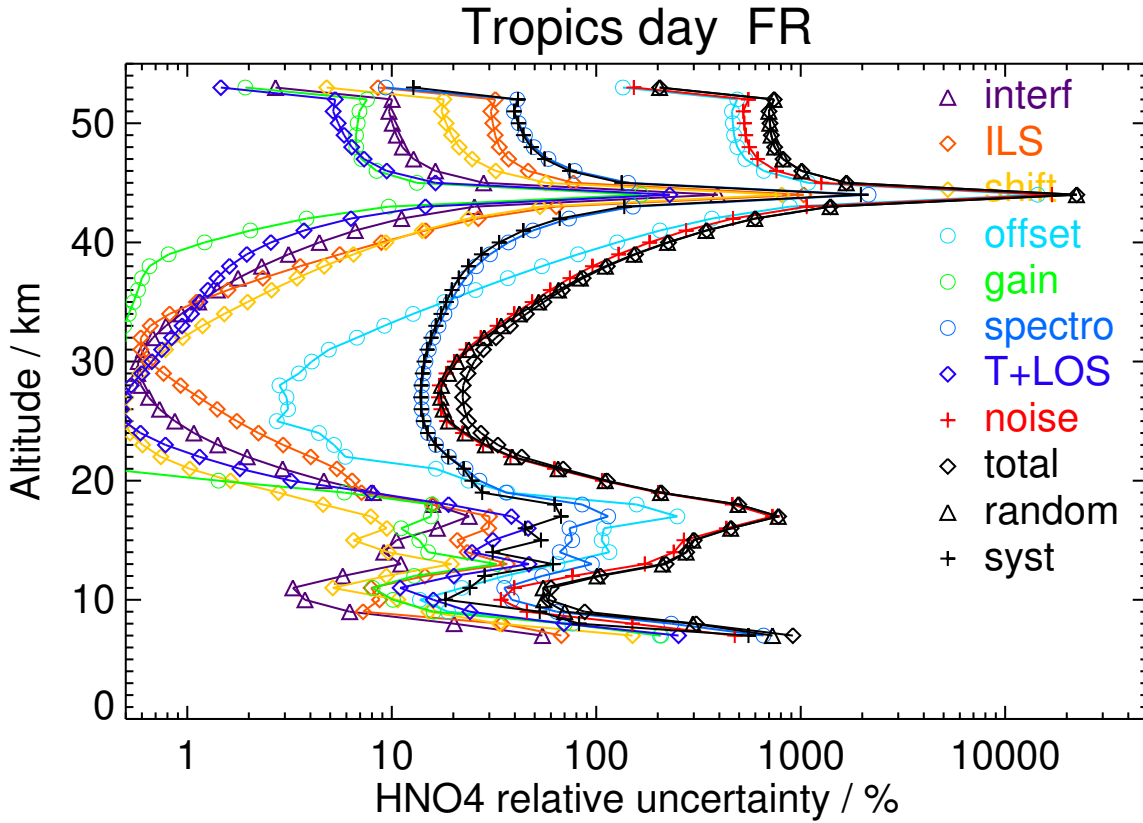


Figure S17: V8H.HNO₄.62 Tropics day

Table S22: HNO₄ 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)
9	30.79	1.40	1.61	4.21	3.32	3.36	14.92	6.14	10.38	15.28	13.38	20.31
12	11.78	0.96	2.49	1.26	3.76	0.69	6.92	4.29	9.96	13.04	4.34	13.74
15	4.77	0.77	1.54	0.38	6.10	0.37	6.32	2.60	17.01	18.60	5.55	19.41
18	-5.12	0.95	0.86	0.17	9.17	0.47	4.15	1.07	26.78	28.49	3.10	28.66
21	44.23	1.36	2.32	0.44	8.01	0.22	10.17	0.91	29.25	30.60	9.77	32.12
24	137.59	1.54	3.14	0.76	6.67	0.41	21.44	0.85	31.91	33.00	21.15	39.20
27	218.40	1.34	2.44	1.07	6.46	0.87	30.44	1.00	35.14	36.13	30.15	47.06
30	218.08	1.12	1.32	1.36	7.93	0.97	30.78	1.31	39.24	40.31	30.54	50.57
33	152.55	1.04	0.91	1.64	11.93	0.84	24.60	1.32	43.45	45.31	24.29	51.41
36	82.09	1.08	1.32	2.08	19.33	0.57	17.52	1.06	46.09	50.31	16.81	53.05
39	36.89	1.20	2.29	2.61	30.73	0.26	13.11	0.80	49.40	58.62	11.59	59.76
42	11.41	1.40	3.57	3.12	45.67	0.49	11.44	0.76	58.31	74.55	9.14	75.11
45	-4.56	1.61	4.74	3.43	61.60	0.83	11.14	0.88	70.97	94.46	8.44	94.84
48	-15.94	1.75	5.58	3.51	76.04	1.10	11.19	0.93	86.11	115.33	8.36	115.64
52	-24.14	1.84	6.23	3.46	90.28	1.36	11.25	0.90	101.27	136.08	8.44	136.34

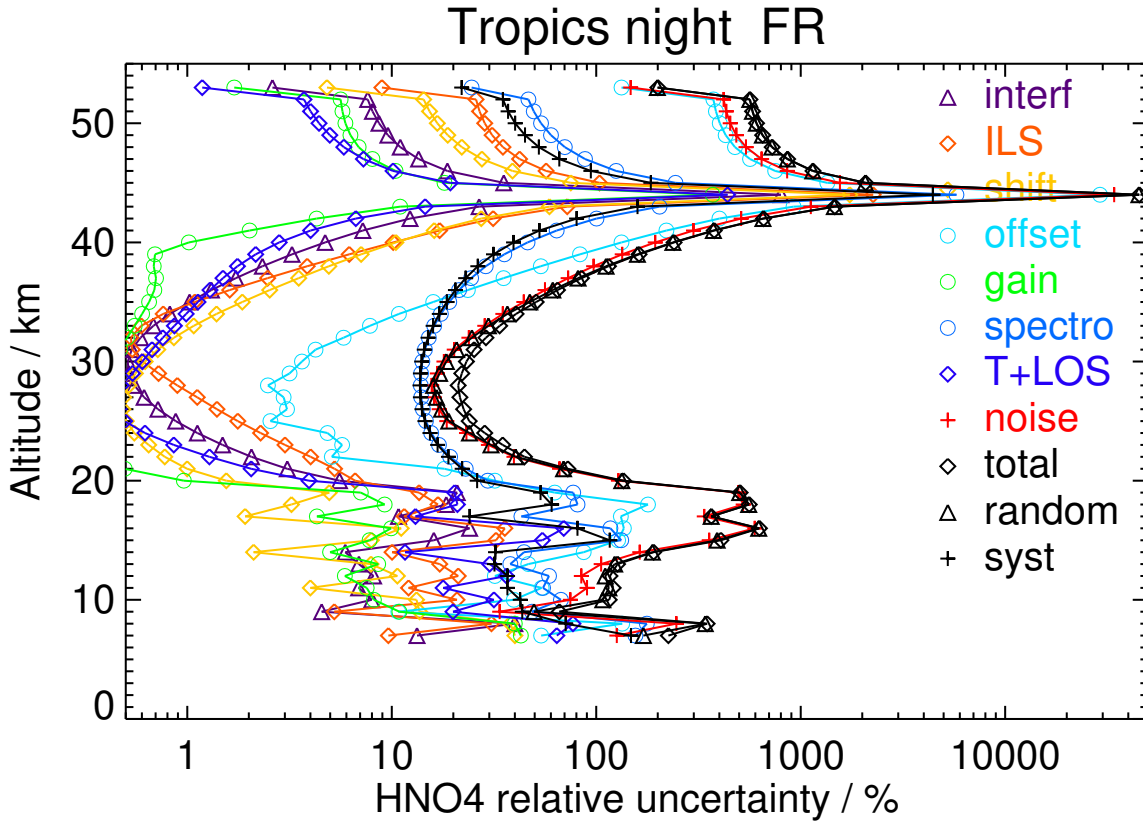


Figure S18: V8H_HNO₄_62 Tropics night

Table S23: HNO₄ 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)
6	-13.58	2.26	0.95	1.55	7.19	5.89	21.74	11.80	14.13	23.56	18.74	30.11
9	18.68	1.21	0.69	1.19	5.63	3.12	11.39	6.95	11.69	16.80	8.78	18.96
12	7.15	0.64	0.45	0.40	4.63	0.89	5.51	3.03	12.30	13.91	4.52	14.62
15	16.25	0.61	0.69	0.11	4.60	0.61	3.85	1.79	16.52	17.49	2.76	17.70
18	36.04	0.88	1.34	0.43	4.08	0.31	7.29	1.27	21.62	22.36	6.47	23.27
21	81.91	1.31	1.60	0.61	3.86	0.38	13.49	0.83	27.34	28.09	12.68	30.82
24	126.10	1.59	1.66	0.83	5.21	0.57	19.38	0.91	33.51	34.56	18.40	39.15
27	136.58	1.53	1.18	0.98	8.28	0.77	21.28	1.07	40.20	41.79	19.94	46.30
30	108.18	1.39	0.80	1.16	14.84	0.66	18.82	1.11	45.52	48.50	17.30	51.50
33	69.96	1.34	0.78	1.43	24.95	0.43	14.74	1.00	50.16	56.45	13.20	57.98
36	32.42	1.38	1.21	1.77	38.46	0.28	11.30	0.84	55.53	67.85	9.69	68.54
39	5.47	1.47	2.03	2.14	54.26	0.37	9.15	0.80	64.04	84.16	7.51	84.50
42	-10.53	1.61	2.99	2.47	70.49	0.57	8.04	0.87	76.76	104.41	6.56	104.62
45	-16.61	1.75	3.78	2.72	84.42	0.74	7.59	1.00	89.22	123.00	6.34	123.17
48	-24.62	1.85	4.34	2.87	94.59	0.79	7.50	1.08	99.56	137.50	6.35	137.65
52	-186.74	2.00	6.23	3.28	97.71	1.41	1.97	0.92	104.40	143.04	6.67	143.20

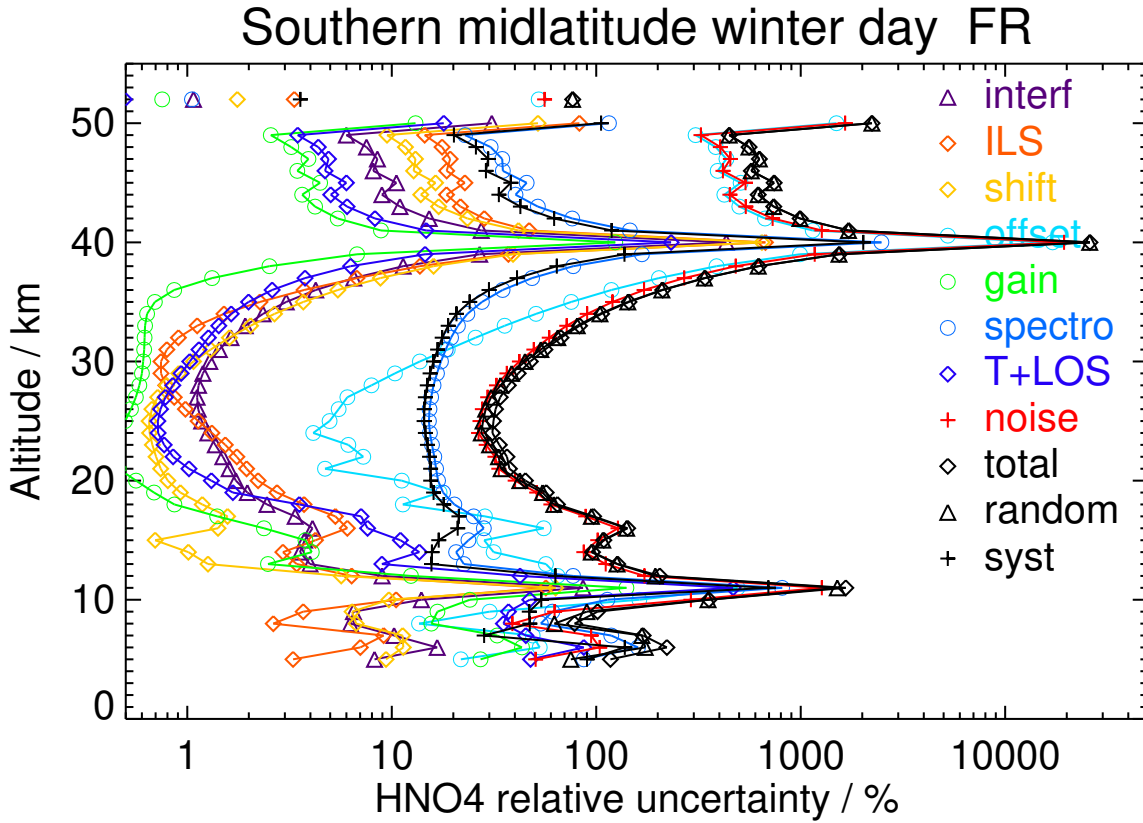


Figure S19: V8H_HNO₄_62 Southern midlatitude winter day

Table S24: HNO₄ 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)
6	-1.06	1.50	0.90	1.48	6.18	4.26	13.33	7.42	12.35	19.18	8.87	21.13
9	23.30	0.88	0.78	1.14	6.73	1.91	7.51	4.50	12.78	16.63	3.90	17.08
12	11.31	0.61	0.46	0.45	6.22	0.54	4.42	2.33	13.99	15.86	2.96	16.13
15	13.13	0.61	0.70	0.17	5.93	0.44	3.65	1.58	18.11	19.32	2.63	19.50
18	43.13	0.88	1.38	0.42	5.08	0.27	8.23	1.17	22.83	23.73	7.51	24.88
21	98.21	1.29	1.74	0.59	4.60	0.42	15.25	0.85	28.14	29.00	14.51	32.43
24	137.53	1.55	1.64	0.84	5.19	0.68	20.85	0.95	33.51	34.66	19.76	39.90
27	135.72	1.48	1.29	1.03	7.73	0.82	21.95	1.06	39.50	41.00	20.68	45.92
30	115.96	1.34	1.03	1.23	13.44	0.66	19.57	1.05	44.53	47.04	18.44	50.52
33	85.14	1.29	1.04	1.53	22.77	0.45	16.33	0.94	48.92	54.33	15.28	56.43
36	56.30	1.34	1.49	1.88	35.87	0.29	13.81	0.80	54.19	65.31	12.55	66.50
39	38.38	1.44	2.24	2.20	51.63	0.28	12.62	0.75	62.94	81.74	10.84	82.45
42	30.95	1.57	3.04	2.44	68.01	0.43	12.50	0.79	75.92	102.29	10.08	102.78
45	31.05	1.69	3.66	2.59	82.65	0.58	12.77	0.89	89.20	121.97	9.85	122.37
48	34.83	1.78	4.13	2.70	93.71	0.68	13.24	0.96	100.03	137.46	9.87	137.81
52	-129.55	1.91	5.00	2.78	91.83	0.71	2.54	1.06	107.40	141.35	5.64	141.46

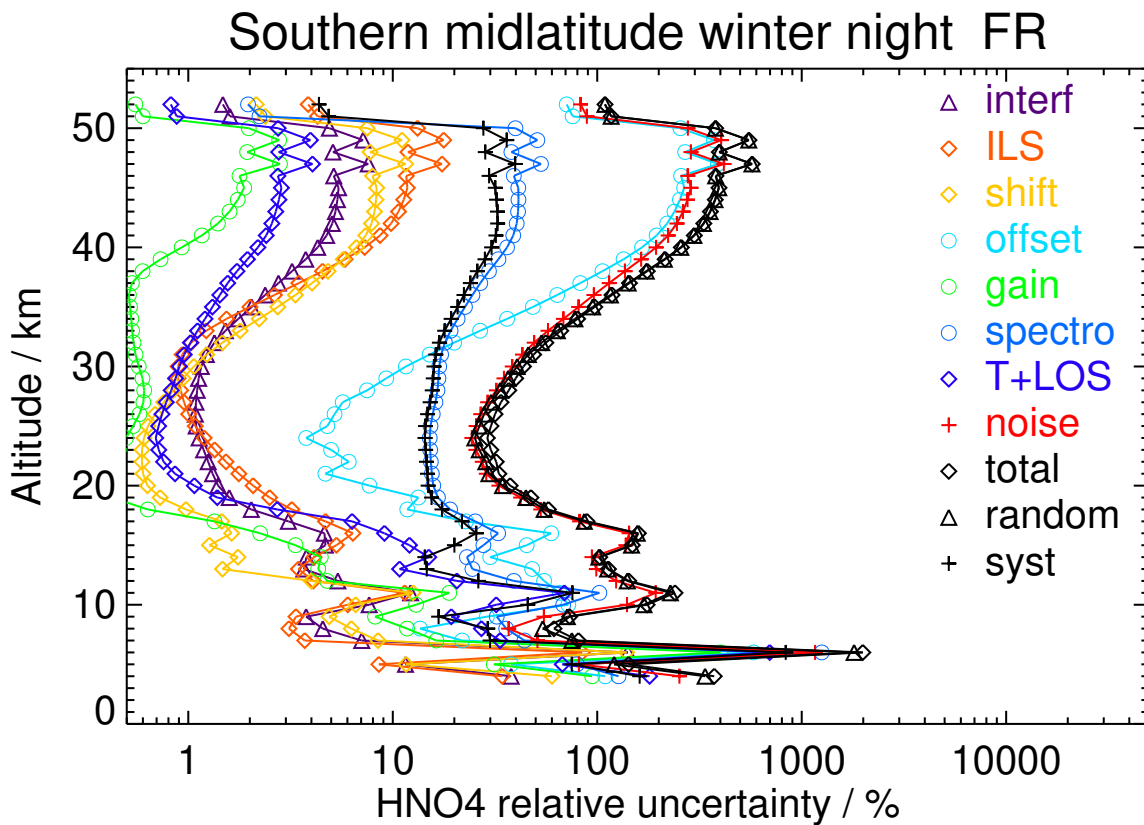


Figure S20: V8H-HNO₄.62 Southern midlatitude winter night

Table S25: HNO₄ 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)
6	-23.72	2.85	1.54	2.47	8.04	7.89	31.80	16.22	16.21	27.41	30.48	40.99
9	36.26	1.46	1.53	1.47	4.11	3.25	14.63	8.65	10.42	16.51	12.60	20.77
12	13.00	0.72	0.73	0.51	3.41	0.76	7.05	3.80	11.24	13.09	5.71	14.29
15	37.87	0.62	1.02	0.17	3.79	0.55	6.29	2.20	15.33	16.30	5.48	17.19
18	76.36	0.81	1.48	0.42	4.42	0.54	12.63	1.56	20.16	21.24	11.83	24.31
21	130.36	1.19	1.59	0.60	4.60	0.76	20.36	1.14	25.26	26.39	19.58	32.86
24	179.53	1.41	2.12	0.84	4.54	1.11	26.72	1.16	29.85	30.95	26.02	40.44
27	180.00	1.27	1.70	1.10	5.16	1.29	27.21	1.30	34.27	35.41	26.39	44.16
30	132.03	1.07	1.20	1.32	7.31	0.99	22.08	1.27	38.80	40.04	21.21	45.32
33	84.36	1.02	1.06	1.61	11.70	0.60	15.91	1.05	43.13	45.09	14.95	47.50
36	48.62	1.08	1.46	2.02	20.12	0.31	11.23	0.79	46.39	50.87	10.16	51.88
39	20.90	1.22	2.34	2.46	32.74	0.17	8.49	0.67	50.44	60.39	7.42	60.84
42	4.18	1.40	3.48	2.81	48.40	0.39	7.38	0.70	59.92	77.25	6.49	77.52
45	-1.65	1.59	4.54	3.06	64.48	0.66	7.13	0.81	73.26	97.81	6.60	98.03
48	-2.91	1.73	5.34	3.16	79.20	0.91	7.19	0.89	87.06	117.89	6.99	118.09
52	-39.48	1.92	6.45	3.23	92.08	1.20	6.20	1.01	100.85	136.72	7.26	136.92

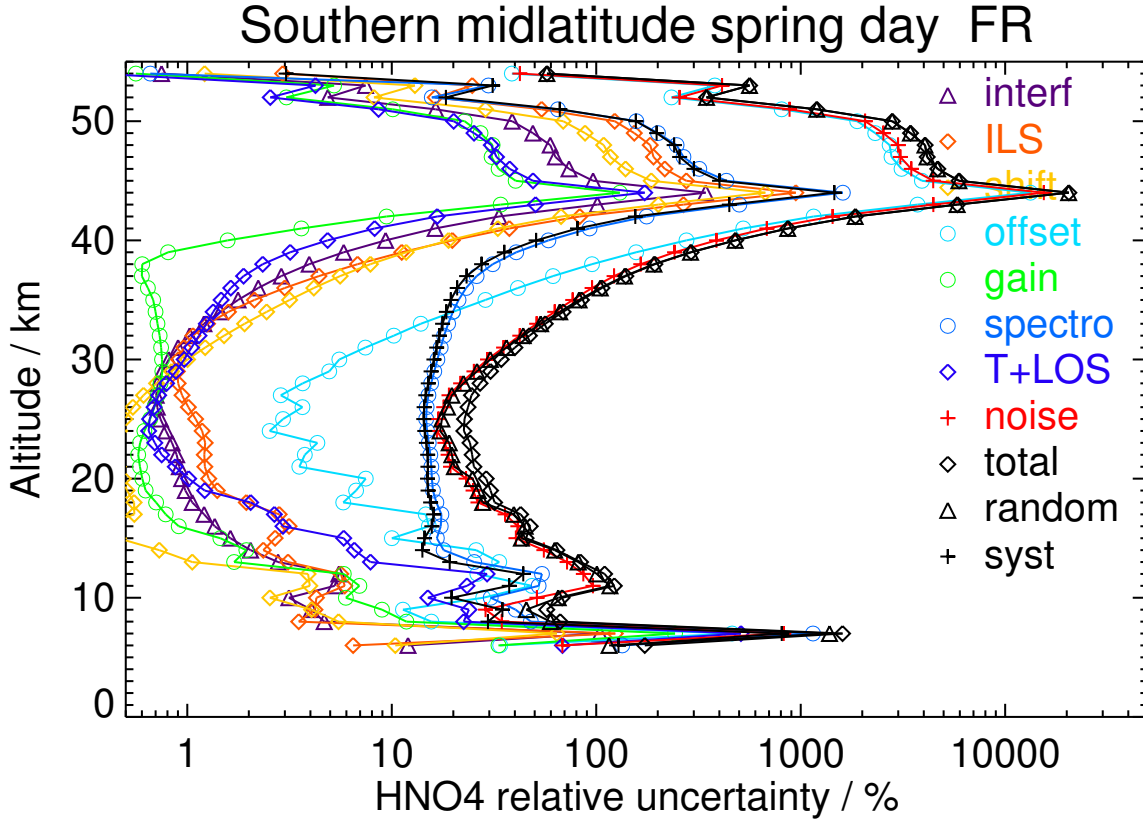


Figure S21: V8H_HNO₄_62 Southern midlatitude spring day

Table S26: HNO₄ 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)
6	-15.88	2.33	1.02	2.53	8.33	6.59	19.26	12.55	16.10	24.47	17.73	30.22
9	38.78	1.26	0.78	1.76	5.00	3.20	9.09	7.65	11.40	16.06	7.33	17.65
12	20.36	0.64	0.56	0.71	3.19	0.79	5.77	3.72	10.82	12.44	4.63	13.27
15	45.69	0.60	1.09	0.26	2.83	0.57	7.40	2.26	14.06	14.86	6.82	16.35
18	89.97	0.78	1.75	0.50	3.06	0.58	14.47	1.74	18.26	19.01	14.08	23.65
21	153.02	1.13	1.54	0.67	4.06	0.76	23.73	1.23	23.40	24.13	23.48	33.67
24	214.07	1.35	2.53	0.89	4.44	1.24	32.18	1.24	28.46	29.18	32.03	43.33
27	230.33	1.22	1.90	1.14	5.06	1.57	34.17	1.41	33.53	34.32	33.92	48.25
30	181.76	1.07	1.08	1.27	7.55	1.29	29.23	1.46	38.75	39.98	28.68	49.20
33	121.75	1.04	0.73	1.42	12.63	0.87	21.92	1.26	43.84	46.07	21.11	50.67
36	76.18	1.11	0.94	1.75	21.93	0.50	15.85	0.96	47.77	52.93	14.78	54.96
39	43.91	1.23	1.73	2.24	35.06	0.25	12.45	0.74	52.20	63.28	10.75	64.18
42	28.70	1.42	2.95	2.77	50.86	0.36	11.38	0.71	61.49	80.23	8.90	80.72
45	22.55	1.63	4.20	3.22	67.03	0.63	11.34	0.81	74.62	100.75	8.45	101.10
48	14.78	1.80	5.15	3.47	81.70	0.86	11.53	0.89	87.83	120.38	8.56	120.69
52	-59.36	1.92	6.43	3.60	93.96	1.21	8.04	0.95	101.00	138.19	7.71	138.40

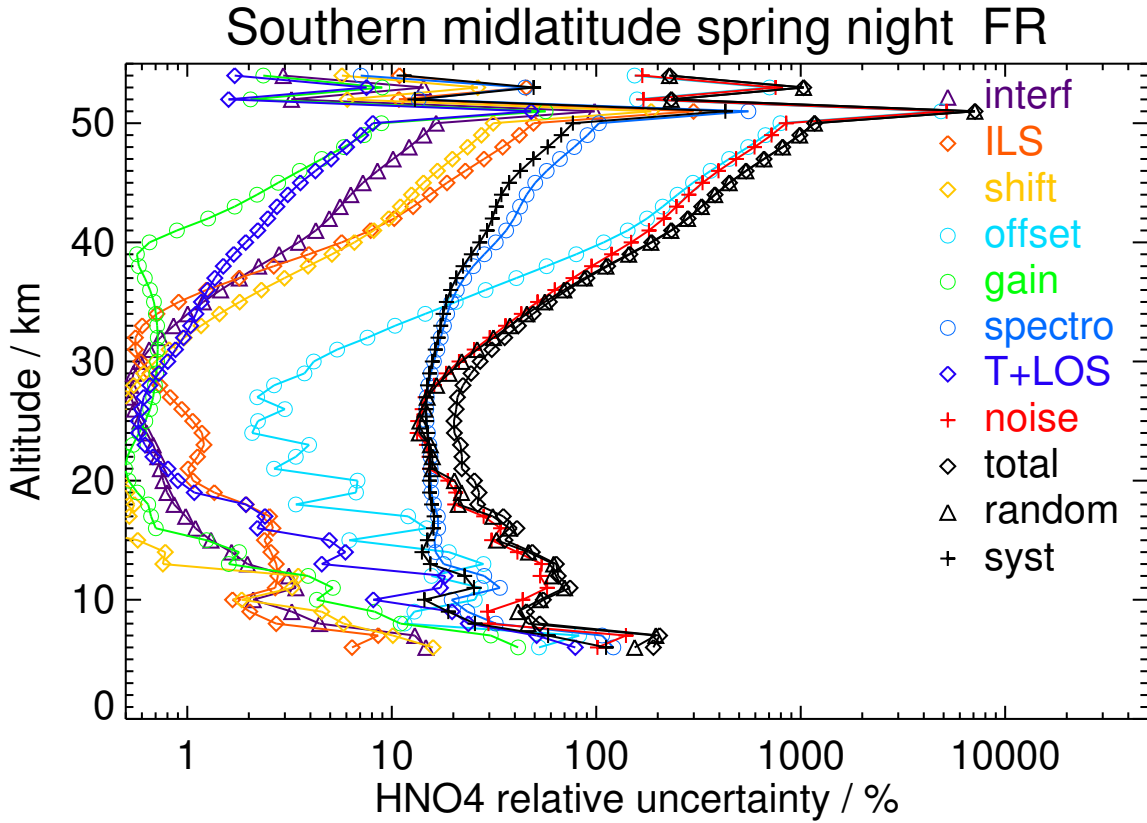


Figure S22: V8H_HNO₄.62 Southern midlatitude spring night

Table S27: HNO₄ 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)
6	-24.16	2.14	1.51	2.82	6.78	5.91	29.48	11.56	14.33	23.28	27.60	36.11
9	42.07	1.22	1.62	2.18	5.59	3.08	16.28	6.47	12.23	19.26	11.64	22.50
12	20.58	0.63	1.00	0.77	4.79	0.96	6.86	2.77	12.32	14.39	5.03	15.25
15	36.57	0.58	0.89	0.29	4.71	0.53	6.05	1.72	16.25	17.34	5.17	18.09
18	71.06	0.80	1.35	0.42	3.96	0.45	11.74	1.34	20.20	20.96	11.27	23.79
21	138.66	1.16	1.90	0.48	3.44	0.57	21.12	1.03	24.83	25.49	20.76	32.88
24	197.49	1.42	2.24	0.78	3.54	1.19	29.25	1.17	28.94	29.52	29.06	41.43
27	212.46	1.31	1.63	1.04	4.30	1.35	31.09	1.39	33.63	34.30	30.81	46.11
30	167.17	1.12	0.82	1.31	6.01	1.04	26.07	1.44	37.99	38.94	25.48	46.54
33	102.14	1.02	0.75	1.67	9.17	0.69	18.38	1.22	42.27	43.62	17.67	47.06
36	55.69	1.04	1.43	2.18	14.99	0.46	12.10	0.90	45.31	48.01	11.32	49.33
39	18.25	1.18	2.55	2.70	24.53	0.30	8.77	0.79	47.90	54.12	7.75	54.67
42	-5.10	1.39	3.91	3.06	37.54	0.26	7.77	0.92	54.77	66.73	6.67	67.06
45	-13.90	1.62	5.26	3.29	52.06	0.52	7.75	1.14	66.18	84.52	7.07	84.81
48	-18.49	1.79	6.37	3.33	66.24	0.92	7.81	1.20	81.06	104.96	7.72	105.24
52	-14.73	1.88	7.31	3.28	80.82	1.62	7.77	1.13	97.74	127.07	8.33	127.34

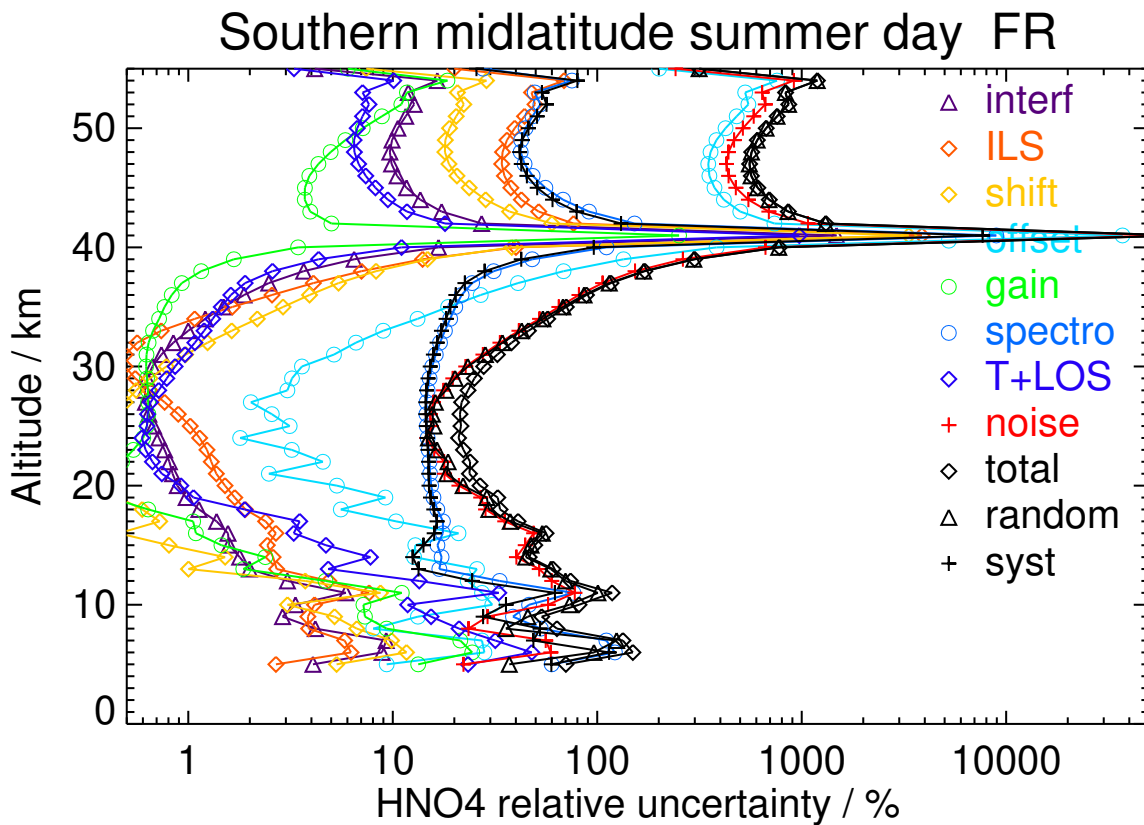


Figure S23: V8H_HNO₄_62 Southern midlatitude summer day

Table S28: HNO₄ 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)
6	-19.91	1.42	0.86	2.43	6.28	4.19	14.58	7.36	12.62	18.76	11.83	22.18
9	28.80	1.05	2.52	1.21	6.45	1.65	10.96	4.47	12.05	17.72	4.94	18.40
12	19.42	0.68	1.46	0.50	7.02	0.68	6.05	2.47	14.16	16.86	3.42	17.20
15	30.49	0.60	1.24	0.23	7.02	0.40	6.28	1.58	17.82	19.64	5.04	20.28
18	67.62	0.83	1.44	0.36	5.95	0.36	11.67	1.23	21.75	22.99	10.99	25.48
21	141.71	1.19	1.88	0.50	4.79	0.60	21.92	1.02	25.79	26.65	21.57	34.29
24	204.96	1.44	2.35	0.78	4.33	1.28	30.78	1.20	29.83	30.51	30.60	43.21
27	225.63	1.32	1.61	1.05	4.92	1.47	33.39	1.40	33.88	34.77	32.98	47.92
30	186.12	1.12	0.82	1.33	6.30	1.17	28.95	1.47	38.19	39.32	28.24	48.41
33	121.45	1.01	0.80	1.71	9.14	0.78	21.24	1.26	42.28	43.71	20.45	48.26
36	73.13	1.03	1.43	2.21	14.42	0.50	14.84	0.92	45.16	47.81	13.84	49.77
39	44.38	1.16	2.62	2.74	23.32	0.28	11.24	0.75	47.27	53.12	9.97	54.05
42	24.62	1.37	4.01	3.12	35.79	0.42	9.77	0.82	53.49	64.76	8.52	65.32
45	9.93	1.61	5.28	3.33	50.13	0.73	9.44	1.00	64.47	82.04	8.45	82.47
48	1.33	1.78	6.27	3.35	64.42	1.01	9.49	1.08	79.36	102.55	8.81	102.93
52	-8.72	1.89	7.06	3.28	79.26	1.33	8.47	1.03	96.51	125.13	8.81	125.44

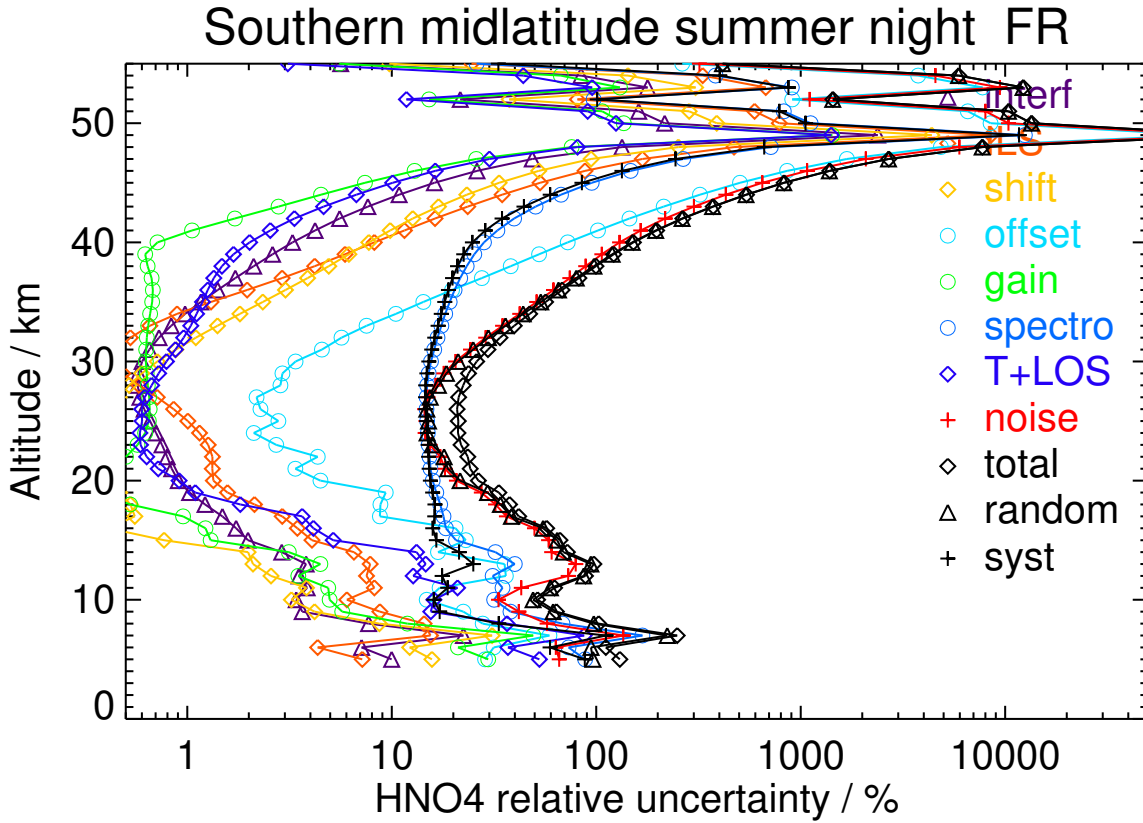


Figure S24: V8H_HNO₄_62 Southern midlatitude summer night

Table S29: HNO₄ 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)
6	35.34	1.56	0.36	1.81	3.98	4.62	12.22	6.25	7.83	11.07	13.04	17.11
9	14.07	1.13	0.99	1.47	4.22	2.38	11.54	5.29	9.17	14.85	7.27	16.53
12	11.92	0.67	0.89	0.54	6.32	0.66	6.22	2.62	12.27	14.61	4.97	15.43
15	17.44	0.61	0.88	0.22	8.36	0.50	3.87	1.67	17.08	19.33	2.70	19.52
18	35.61	0.80	0.95	0.37	9.66	0.31	6.89	0.85	22.72	25.01	5.85	25.68
21	79.07	1.23	2.06	0.56	9.35	0.35	13.11	0.71	27.65	29.54	12.56	32.10
24	135.06	1.46	2.22	0.82	7.57	0.63	20.36	0.84	31.64	33.00	19.81	38.49
27	155.55	1.33	1.57	1.04	7.46	0.88	23.15	1.00	36.23	37.45	22.55	43.71
30	134.86	1.16	0.93	1.22	10.55	0.76	20.88	1.11	41.19	42.95	20.13	47.43
33	80.67	1.14	0.76	1.47	18.31	0.50	16.68	0.98	45.62	49.61	15.46	51.96
36	44.88	1.22	1.06	1.77	30.66	0.27	13.42	0.75	50.01	59.12	11.51	60.23
39	30.30	1.34	1.64	2.10	46.45	0.31	11.83	0.61	58.21	74.90	9.23	75.47
42	21.55	1.49	2.36	2.42	63.31	0.55	11.27	0.61	71.09	95.58	8.22	95.93
45	12.95	1.62	3.00	2.66	78.91	0.74	11.07	0.68	84.33	115.84	7.85	116.11
48	13.96	1.72	3.51	2.80	91.65	0.88	11.17	0.74	96.73	133.57	7.95	133.81
52	30.33	1.87	5.27	3.21	97.35	1.12	4.45	0.84	103.60	142.24	6.36	142.38

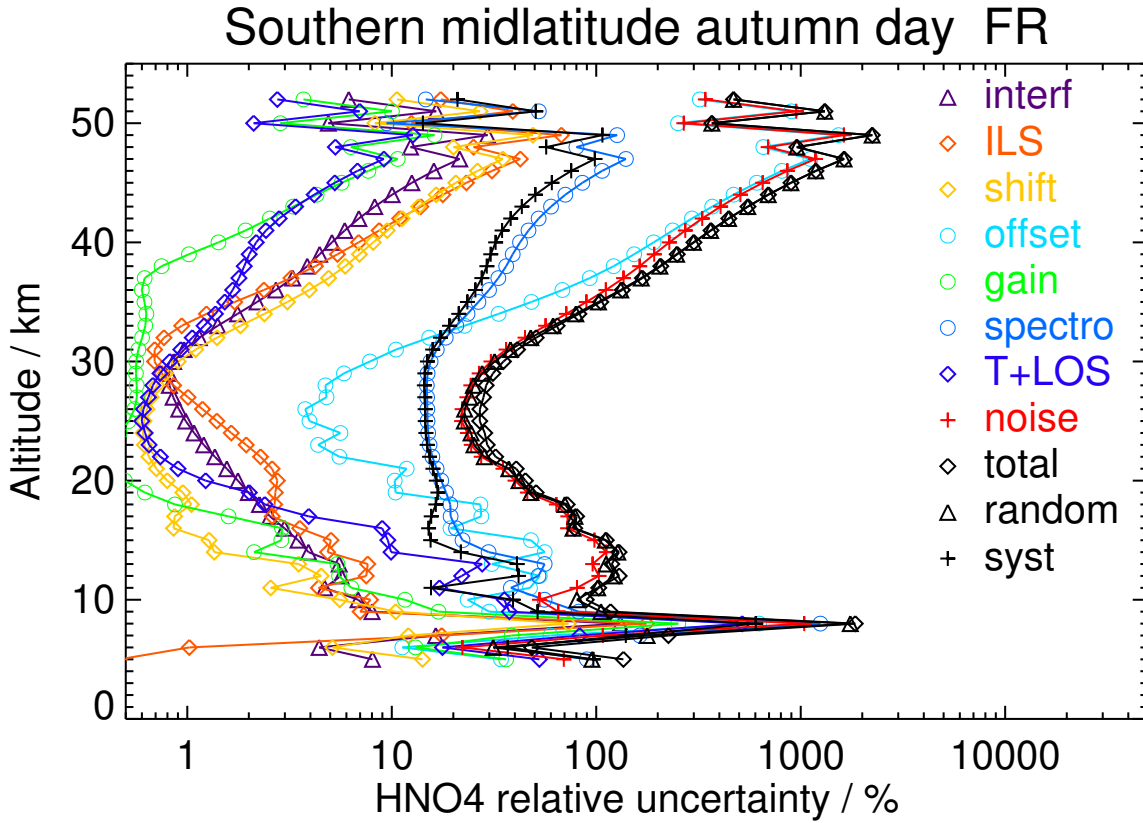


Figure S25: V8H_HNO₄.62 Southern midlatitude autumn day

Table S30: HNO₄ 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)
6	-22.27	3.30	0.93	2.19	9.31	3.77	11.81	15.14	17.60	25.35	12.38	28.21
9	31.83	1.57	0.90	1.92	3.81	2.45	10.54	8.12	10.21	15.03	9.10	17.57
12	3.05	0.77	0.70	0.71	4.97	0.94	6.67	3.81	11.37	13.63	5.46	14.68
15	21.19	0.62	1.01	0.25	7.24	0.52	4.07	2.06	16.22	18.15	2.89	18.38
18	38.46	0.81	0.90	0.37	9.18	0.29	7.33	0.96	22.24	24.39	6.38	25.21
21	91.41	1.24	2.10	0.52	9.28	0.30	14.70	0.71	27.46	29.27	14.38	32.61
24	158.97	1.46	2.24	0.79	7.46	0.79	23.37	0.87	31.63	32.93	22.96	40.14
27	179.05	1.33	1.53	1.03	7.60	1.00	26.47	1.10	36.02	37.30	25.93	45.43
30	153.75	1.15	0.90	1.23	9.94	0.85	23.91	1.18	40.92	42.58	23.18	48.49
33	107.31	1.12	0.75	1.49	17.03	0.59	19.02	1.05	45.29	48.85	17.95	52.04
36	61.91	1.20	1.11	1.83	28.37	0.33	14.65	0.84	49.24	57.28	13.06	58.75
39	26.87	1.33	1.82	2.23	43.38	0.28	11.95	0.69	56.30	71.48	9.77	72.15
42	2.83	1.49	2.71	2.61	60.06	0.51	10.73	0.69	68.60	91.54	8.10	91.90
45	-13.31	1.65	3.48	2.87	75.80	0.70	10.30	0.79	81.76	111.82	7.48	112.07
48	-22.74	1.77	4.05	2.99	89.33	0.87	10.15	0.85	94.91	130.64	7.30	130.84
52	-26.89	1.87	5.19	3.24	96.51	1.08	11.19	0.89	104.07	142.29	8.13	142.52

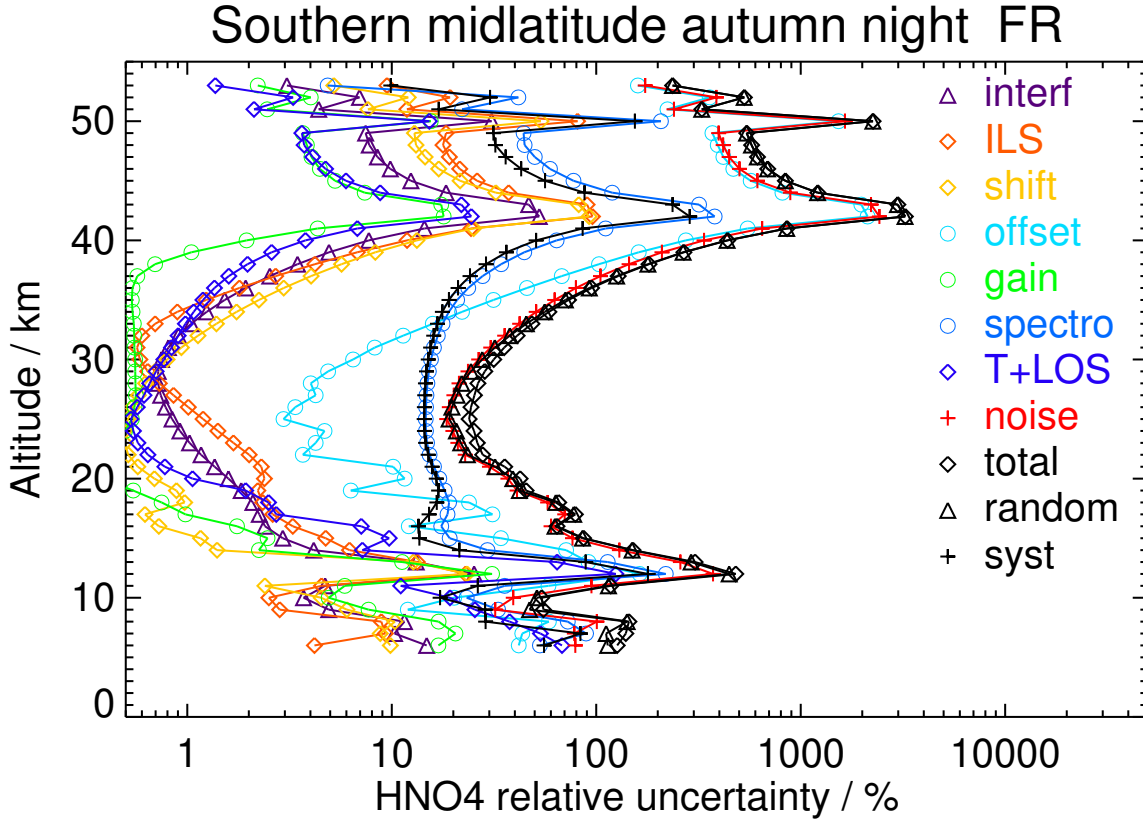


Figure S26: V8H_HNO₄_62 Southern midlatitude autumn night

Table S31: HNO₄ 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)
6	-0.83	1.32	1.94	0.72	6.66	5.08	19.67	8.03	11.83	16.11	20.20	25.84
9	5.29	0.73	0.76	0.22	10.55	0.69	4.85	2.29	17.69	21.19	2.38	21.33
12	-7.98	0.66	0.62	0.11	9.44	0.18	2.52	2.05	19.31	21.72	1.27	21.76
15	-2.19	0.74	0.65	0.23	6.51	0.18	2.79	1.46	22.89	23.98	1.44	24.03
18	4.64	1.10	0.92	0.34	4.27	0.21	3.75	1.05	29.13	29.60	2.78	29.73
21	24.86	1.50	0.86	0.52	5.51	0.16	5.72	0.72	36.59	37.20	4.61	37.49
24	42.04	1.74	0.66	0.74	8.68	0.15	7.62	0.67	42.86	43.95	6.62	44.44
27	49.25	1.73	0.52	0.98	13.65	0.20	8.84	0.64	47.64	49.79	7.74	50.39
30	46.92	1.62	0.58	1.24	21.17	0.23	9.60	0.63	50.91	55.41	8.25	56.02
33	45.02	1.54	0.91	1.50	31.68	0.25	10.26	0.64	53.68	62.64	8.57	63.22
36	47.10	1.53	1.67	1.76	45.11	0.24	10.94	0.69	58.52	74.21	8.93	74.75
39	42.93	1.58	2.78	1.96	60.57	0.29	11.57	0.80	67.78	91.23	9.41	91.72
42	35.41	1.69	3.93	2.09	76.26	0.42	12.07	0.93	80.52	111.22	9.95	111.66
45	28.62	1.80	4.80	2.17	90.07	0.56	12.38	1.05	92.82	129.64	10.39	130.05
48	22.37	1.89	5.37	2.20	101.51	0.69	12.54	1.13	103.32	145.13	10.69	145.52

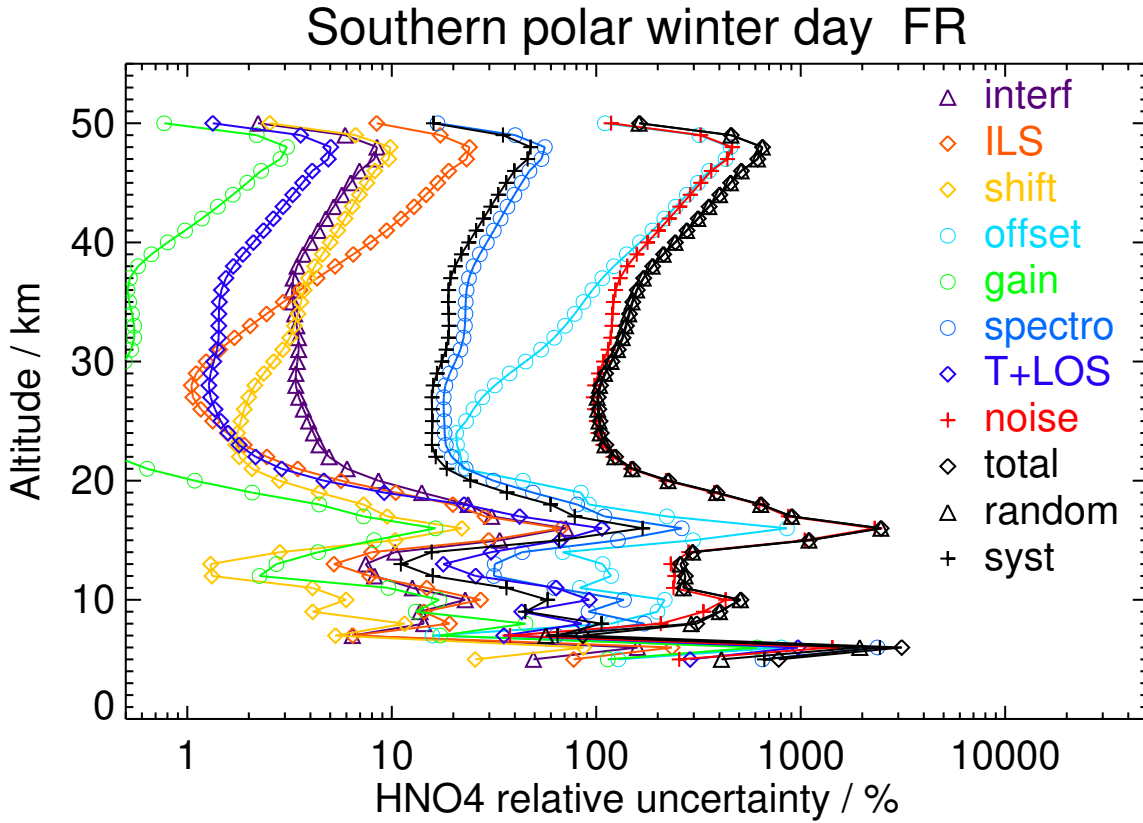


Figure S27: V8H_HNO₄_62 Southern polar winter day

Table S32: HNO₄ 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)
6	0.62	1.12	1.14	0.59	5.98	2.40	8.22	5.69	10.31	14.75	5.75	15.83
9	11.22	0.68	0.51	0.31	7.40	0.95	3.53	2.97	13.07	15.66	1.84	15.77
12	-0.69	0.61	0.32	0.18	8.73	0.31	2.39	1.83	17.75	19.99	1.24	20.03
15	-1.04	0.71	0.51	0.22	8.02	0.35	2.44	1.50	22.92	24.43	1.36	24.47
18	-0.40	1.05	0.87	0.42	5.89	0.17	3.13	1.12	28.57	29.32	2.14	29.39
21	-1.83	1.48	0.82	0.56	5.97	0.14	4.48	0.65	35.54	36.24	2.95	36.36
24	4.43	1.74	0.71	0.73	9.49	0.22	5.61	0.59	42.72	43.99	3.95	44.17
27	14.99	1.74	0.67	0.92	15.99	0.23	6.15	0.59	48.65	51.42	4.62	51.62
30	17.41	1.67	0.82	1.14	25.29	0.22	6.39	0.61	52.91	58.83	4.86	59.03
33	11.57	1.62	1.18	1.38	37.44	0.25	6.85	0.62	56.68	68.14	4.97	68.32
36	-3.53	1.63	1.88	1.60	52.12	0.31	7.76	0.66	62.39	81.55	5.29	81.72
39	-19.59	1.68	2.86	1.77	68.31	0.40	8.82	0.77	72.02	99.55	5.88	99.73
42	-33.56	1.77	3.89	1.89	84.28	0.51	9.73	0.93	84.62	119.74	6.60	119.92
45	-43.73	1.87	4.70	1.98	98.14	0.60	10.33	1.10	96.48	137.93	7.20	138.12
48	-59.36	1.98	5.44	2.04	108.30	0.69	10.63	1.24	105.75	151.68	7.56	151.87

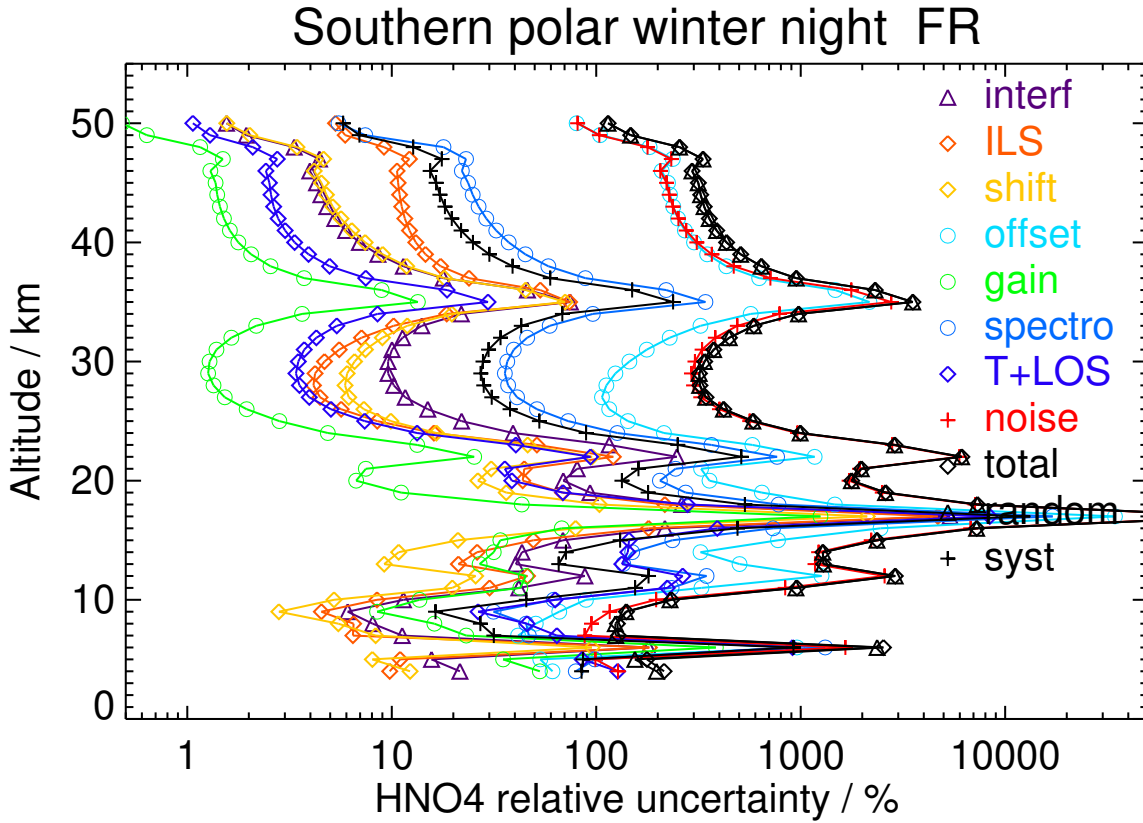


Figure S28: V8H.HNO₄.62 Southern polar winter night

Table S33: HNO₄ 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)
6	-1.42	2.22	9.30	1.05	9.56	0.52	14.91	11.37	16.68	23.95	15.51	28.53
9	14.36	1.00	5.34	0.72	5.00	0.33	6.77	6.98	11.95	15.84	6.44	17.10
12	7.61	0.72	1.44	0.19	3.36	0.18	4.31	3.36	15.20	16.40	2.46	16.58
15	-0.43	0.74	1.41	0.18	4.50	0.14	2.76	1.93	22.47	23.17	1.58	23.22
18	10.33	0.96	1.98	0.15	5.75	0.55	4.83	1.06	28.10	28.83	4.61	29.19
21	57.05	1.37	1.59	0.48	5.69	0.75	8.56	0.81	30.29	31.01	8.19	32.08
24	74.35	1.44	1.38	0.90	5.34	0.66	10.99	0.83	31.83	32.52	10.53	34.19
27	66.06	1.11	2.19	1.46	5.25	0.52	10.82	0.84	34.02	34.80	10.02	36.21
30	47.06	0.89	2.97	1.97	6.17	0.32	9.29	0.78	36.77	37.71	8.29	38.61
33	32.22	0.89	3.32	2.34	8.45	0.32	7.68	0.69	40.20	41.44	6.88	42.01
36	23.43	0.96	3.41	2.55	14.11	0.30	6.39	0.60	43.64	46.12	6.04	46.52
39	11.94	1.08	3.78	2.64	24.18	0.36	5.92	0.57	46.93	53.02	5.86	53.34
42	-3.42	1.23	4.57	2.62	38.20	0.58	6.19	0.60	53.98	66.34	6.29	66.64
45	-19.16	1.39	5.58	2.55	54.05	0.84	6.69	0.65	66.66	86.02	7.09	86.31
48	-33.70	1.52	6.53	2.47	69.16	1.06	7.15	0.70	80.49	106.31	7.93	106.61
52	-59.63	1.61	7.54	2.42	85.15	1.30	7.04	0.75	97.43	129.56	8.66	129.85

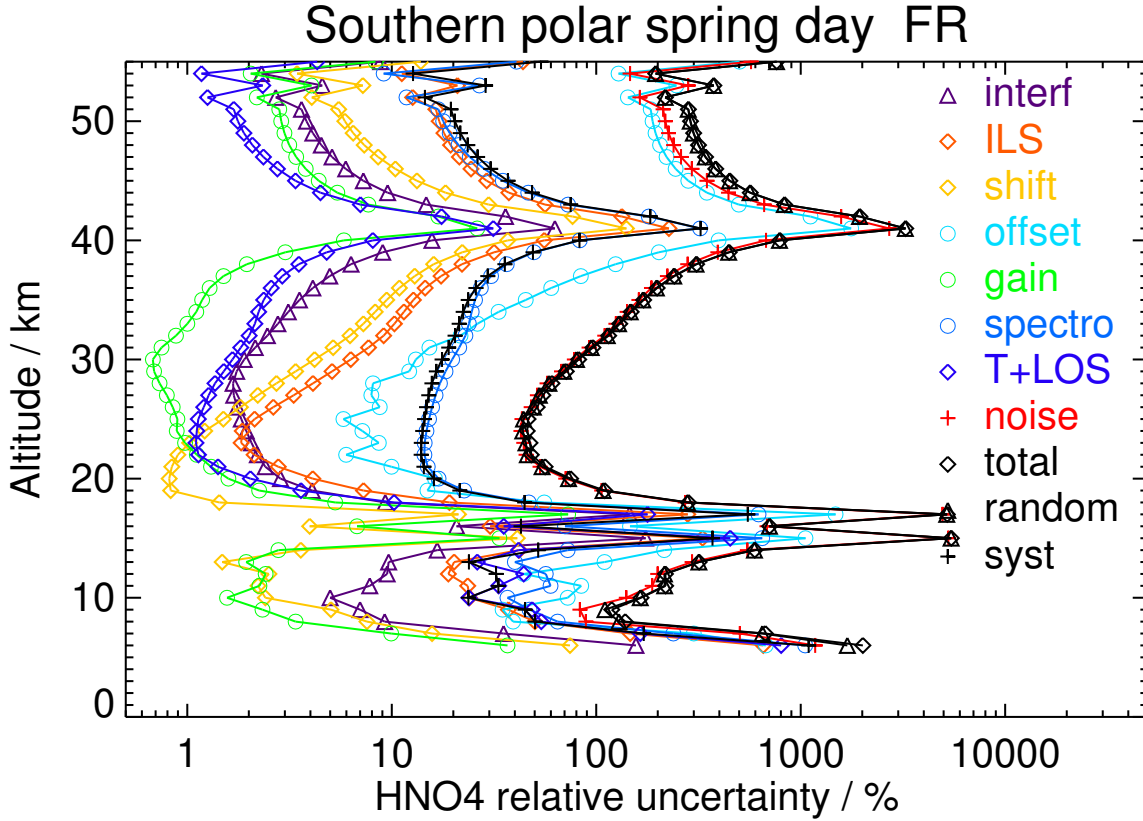


Figure S29: V8H_HNO₄_62 Southern polar spring day

Table S34: HNO₄ 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)
6	-15.39	2.13	6.10	0.98	9.23	2.62	14.43	11.47	15.49	23.08	13.49	26.73
9	28.14	1.13	3.35	0.87	5.97	1.77	6.64	7.12	12.52	16.41	5.84	17.42
12	12.16	0.71	0.98	0.31	3.88	0.46	4.68	3.49	14.14	15.49	3.29	15.84
15	20.51	0.71	1.80	0.19	3.14	0.47	6.56	2.21	19.86	21.05	3.62	21.36
18	40.87	0.93	2.08	0.39	4.62	0.49	10.27	1.31	25.43	26.85	7.72	27.94
21	89.02	1.31	2.01	0.69	5.32	0.64	15.99	0.96	29.37	31.10	13.67	33.97
24	132.27	1.49	2.00	0.95	5.51	0.90	21.19	0.93	32.31	34.37	18.72	39.14
27	126.93	1.27	1.62	1.30	5.97	0.99	21.55	1.05	35.19	37.45	18.56	41.79
30	86.06	1.02	1.79	1.71	7.23	0.79	17.31	1.01	38.39	40.40	14.22	42.83
33	49.61	0.94	2.38	2.11	10.40	0.51	12.17	0.84	41.93	43.93	9.79	45.01
36	29.12	1.01	2.96	2.44	17.59	0.32	8.78	0.69	45.03	48.76	7.33	49.30
39	18.47	1.14	3.73	2.62	29.02	0.30	7.53	0.64	48.70	57.00	6.61	57.39
42	8.84	1.30	4.72	2.68	44.04	0.49	7.70	0.65	57.25	72.53	6.92	72.86
45	-1.66	1.46	5.74	2.69	60.15	0.75	8.35	0.70	70.69	93.11	7.58	93.42
48	-11.17	1.58	6.54	2.69	75.07	0.98	8.92	0.75	84.42	113.26	8.22	113.56
52	-30.14	1.68	7.80	2.64	85.88	1.16	9.95	0.87	98.20	130.79	9.24	131.11

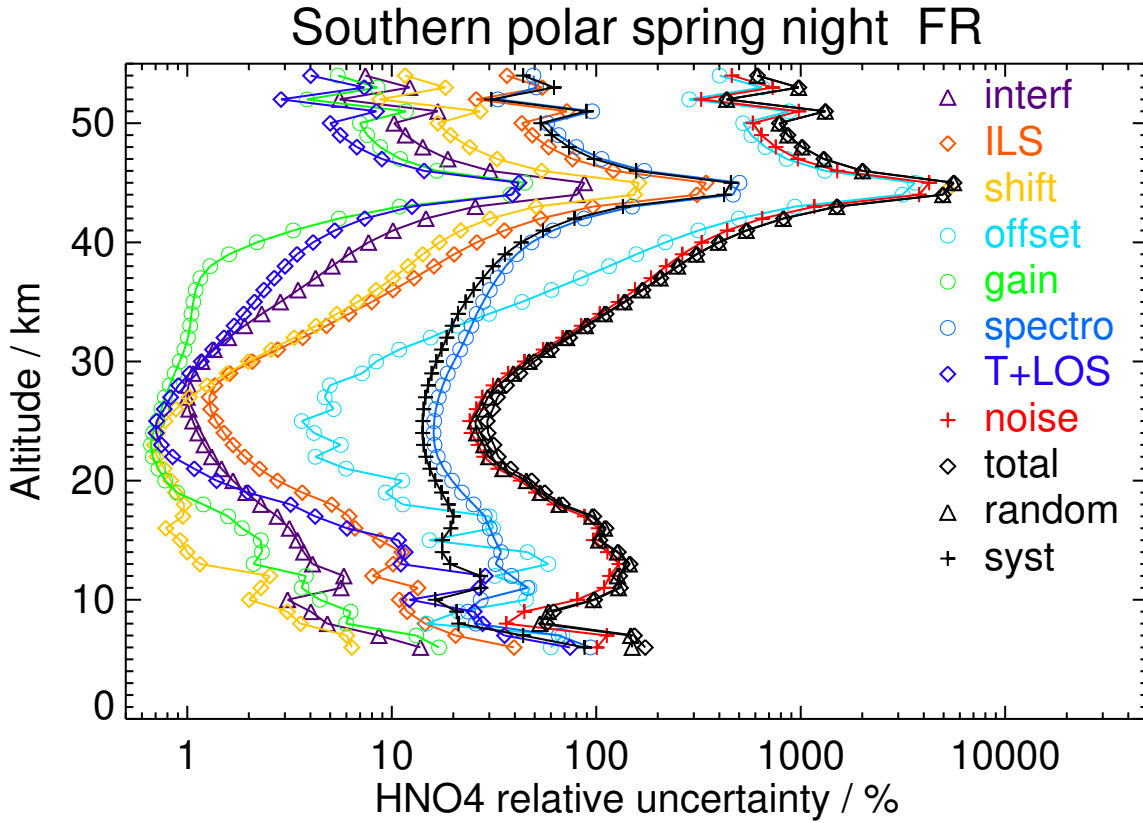


Figure S30: V8H_HNO₄.62 Southern polar spring night

Table S35: HNO₄ 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)
6	-14.27	1.74	0.51	1.95	6.11	4.42	21.96	9.93	12.47	21.25	18.68	28.29
9	38.47	1.08	0.82	1.61	5.71	2.50	13.87	6.37	12.00	17.86	10.06	20.50
12	24.78	0.62	0.67	0.60	5.02	0.66	6.88	2.67	12.46	14.23	5.84	15.38
15	45.11	0.58	1.02	0.26	4.59	0.53	7.33	1.77	15.54	16.57	6.82	17.92
18	93.10	0.78	0.86	0.54	3.51	0.45	14.38	1.54	18.86	19.54	14.04	24.06
21	124.13	1.10	0.98	0.53	2.90	0.93	18.91	1.32	22.99	23.64	18.46	29.99
24	110.80	1.38	1.44	0.75	3.14	1.05	18.11	1.20	27.37	28.06	17.51	33.07
27	92.39	1.29	1.45	0.89	3.89	0.82	15.77	0.99	32.51	33.27	14.85	36.43
30	90.88	1.08	1.26	1.20	5.34	0.59	13.88	0.83	36.75	37.56	12.90	39.71
33	67.74	0.96	1.12	1.62	7.72	0.46	11.29	0.77	41.07	42.09	10.41	43.35
36	37.72	0.99	1.62	2.11	12.28	0.36	8.74	0.67	44.54	46.42	8.09	47.12
39	23.52	1.13	2.69	2.54	19.85	0.26	7.94	0.71	46.76	51.06	7.21	51.57
42	20.62	1.34	4.15	2.81	30.96	0.34	8.61	0.89	51.19	60.18	7.73	60.67
45	21.95	1.58	5.77	2.92	44.51	0.65	9.55	1.09	60.53	75.51	8.94	76.04
48	25.46	1.78	7.26	2.90	58.53	1.04	10.29	1.16	74.00	94.71	10.22	95.26
52	27.94	1.89	8.76	2.86	74.17	1.77	11.01	1.15	92.33	118.76	11.67	119.33
56	129.65	2.15	9.28	2.93	84.63	1.43	17.54	1.13	105.30	135.15	19.89	136.60

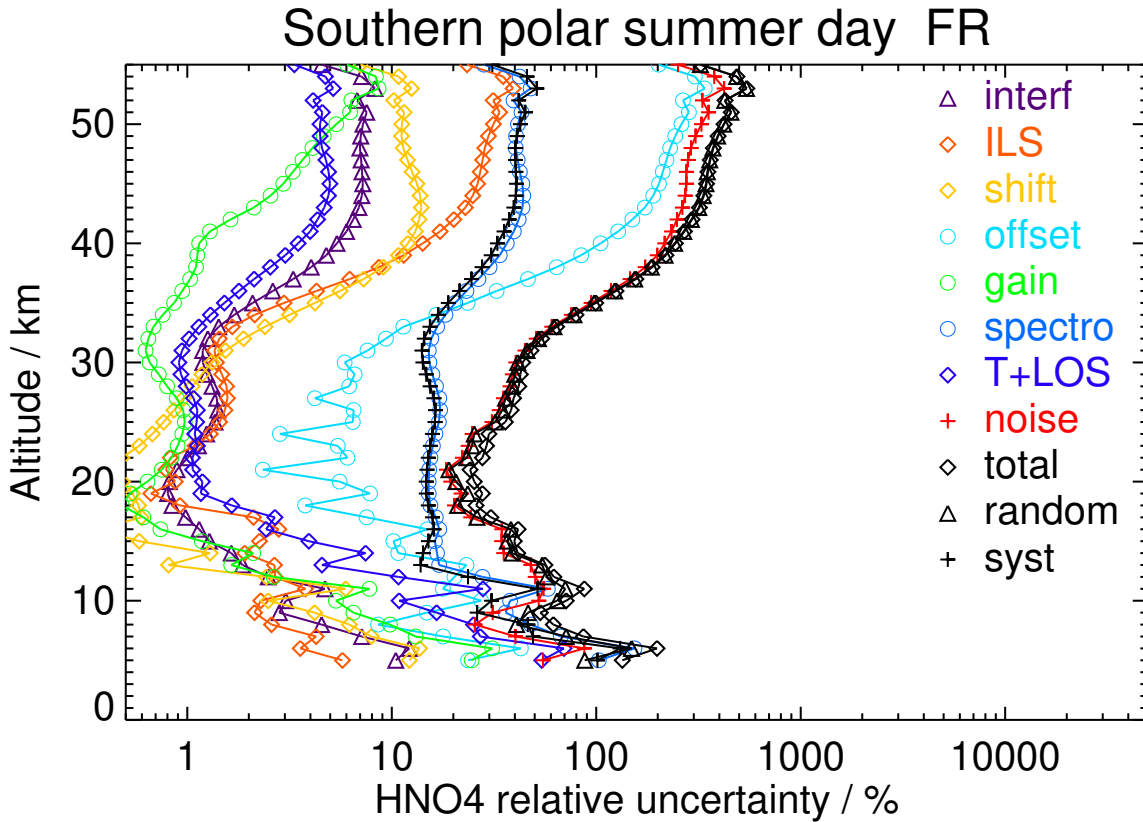


Figure S31: V8H_HNO₄_62 Southern polar summer day

Table S36: HNO₄ 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)
6	-7.95	1.99	0.75	1.49	6.57	4.23	26.04	9.24	12.50	26.27	17.25	31.43
9	23.44	0.83	0.96	0.56	5.27	0.97	6.16	3.10	10.09	12.92	3.61	13.41
12	23.73	0.63	0.69	0.17	7.03	0.47	5.49	1.60	13.73	15.85	4.53	16.49
15	42.51	0.60	1.11	0.14	8.26	0.36	7.32	1.24	18.29	20.34	6.76	21.44
18	89.55	0.79	0.69	0.46	8.20	0.51	13.63	1.15	22.53	24.18	13.36	27.63
21	118.62	1.17	0.99	0.55	6.88	0.87	18.07	1.17	26.26	27.44	17.75	32.68
24	112.73	1.44	1.62	0.72	5.62	1.01	18.43	1.07	30.22	31.16	17.92	35.95
27	111.18	1.33	1.49	0.89	5.32	0.79	17.71	0.94	34.41	35.37	16.77	39.15
30	97.81	1.14	1.10	1.14	6.55	0.59	15.51	0.88	39.01	40.05	14.38	42.55
33	66.08	1.06	0.97	1.49	10.55	0.43	11.89	0.78	43.42	44.95	11.08	46.30
36	38.87	1.09	1.36	1.91	17.37	0.28	8.89	0.64	46.53	49.83	8.32	50.53
39	22.01	1.21	2.35	2.36	27.93	0.17	7.71	0.59	49.80	57.29	7.05	57.72
42	15.36	1.42	3.72	2.72	41.51	0.39	7.98	0.71	57.75	71.38	7.16	71.74
45	13.70	1.66	5.04	2.95	56.07	0.66	8.67	0.91	69.62	89.68	7.91	90.03
48	10.80	1.84	6.08	3.04	69.93	0.90	9.30	1.02	84.10	109.66	8.72	110.01
52	-2.41	1.96	6.92	3.03	84.05	1.16	9.55	1.04	99.95	130.87	9.10	131.19

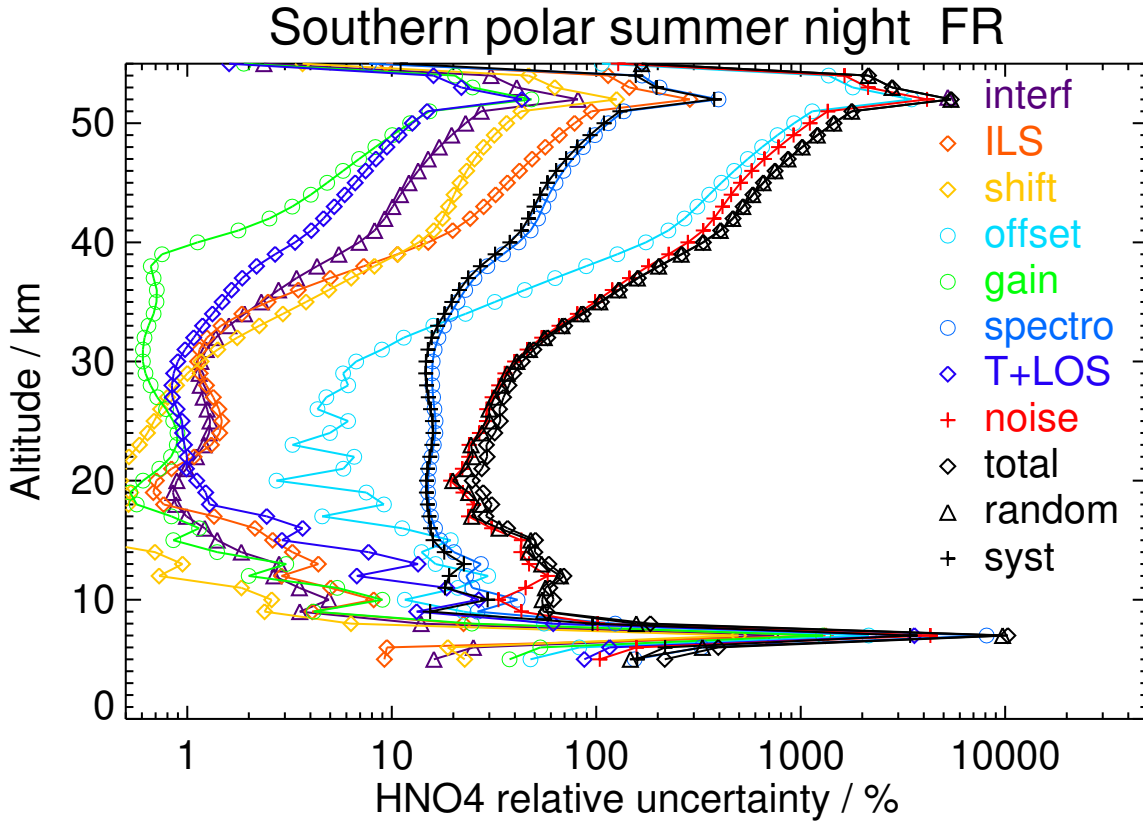


Figure S32: V8H_HNO₄.62 Southern polar summer night

Table S37: HNO4 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)
6	2.61	2.19	2.32	1.55	6.34	5.77	21.15	10.88	11.23	27.65	3.64	27.89
9	8.57	1.18	1.01	0.68	3.81	2.12	5.80	6.31	8.44	12.62	2.70	12.91
12	4.86	0.65	0.64	0.25	5.34	0.60	3.79	3.09	11.32	13.21	2.69	13.48
15	19.73	0.62	0.64	0.19	7.92	0.57	4.28	1.82	16.90	19.00	3.16	19.26
18	31.19	0.85	0.71	0.47	9.93	0.30	6.27	0.90	23.37	25.67	5.20	26.20
21	52.20	1.33	1.31	0.59	9.80	0.39	8.75	0.72	29.11	31.04	7.81	32.01
24	56.48	1.58	1.32	0.72	7.80	0.38	10.35	0.68	34.25	35.55	9.12	36.70
27	56.88	1.47	1.04	0.84	9.26	0.35	10.45	0.67	39.67	41.10	9.15	42.11
30	48.64	1.32	0.77	1.01	15.38	0.26	9.81	0.65	44.75	47.60	8.59	48.37
33	39.70	1.30	0.72	1.24	27.00	0.19	9.47	0.56	49.52	56.65	8.09	57.23
36	38.99	1.36	0.98	1.50	42.69	0.26	9.76	0.53	55.76	70.49	7.94	70.94
39	39.31	1.47	1.48	1.77	60.53	0.43	10.48	0.59	66.17	89.97	8.08	90.33
42	41.61	1.59	2.11	2.01	78.19	0.61	11.28	0.70	79.63	111.91	8.38	112.22
45	42.72	1.72	2.69	2.21	93.82	0.75	11.91	0.83	92.23	131.88	8.69	132.17
48	39.33	1.82	3.18	2.33	106.79	0.88	12.49	0.92	103.49	149.04	8.87	149.30

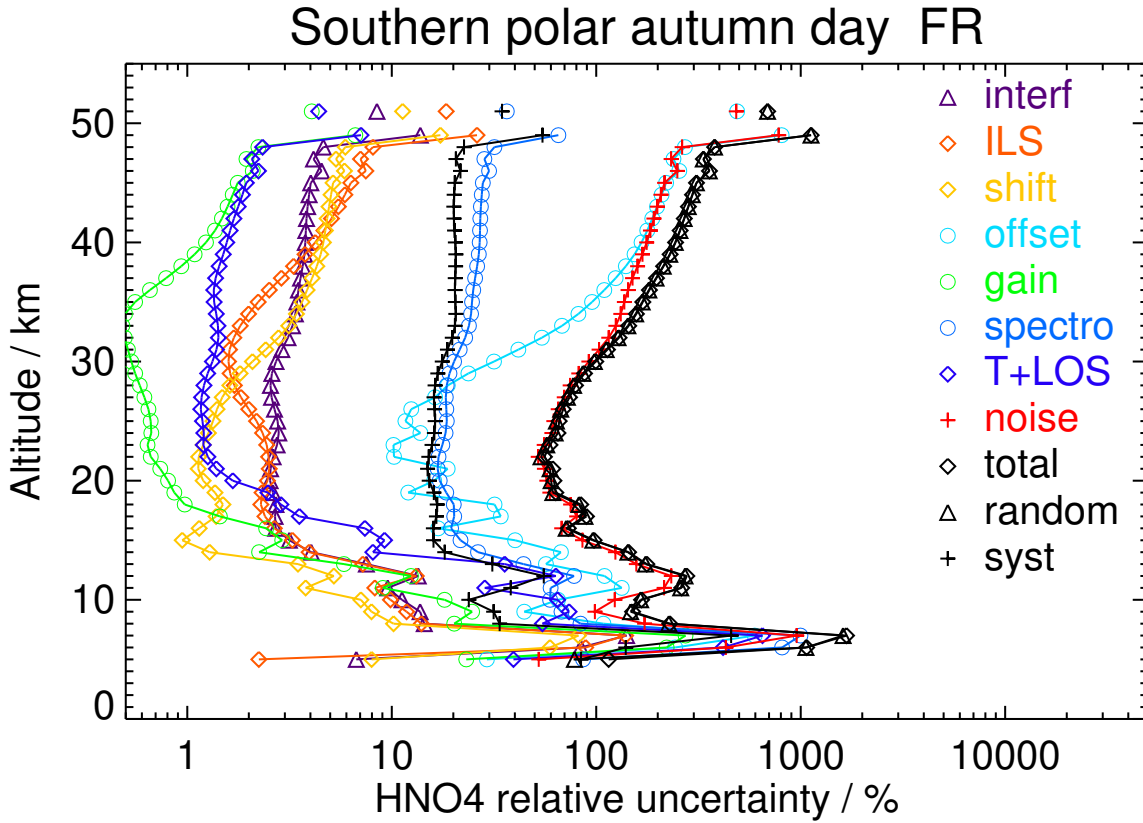


Figure S33: V8H.HNO4.62 Southern polar autumn day

Table S38: HNO₄ 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)
6	10.51	1.73	0.97	1.69	4.72	3.86	10.16	8.01	9.37	16.08	6.38	17.30
9	6.07	0.96	0.59	0.59	5.60	1.68	5.72	4.46	10.02	13.37	3.17	13.74
12	6.23	0.61	0.52	0.24	7.12	0.65	3.40	2.14	13.00	15.31	1.69	15.40
15	10.24	0.63	0.66	0.23	9.35	0.50	3.61	1.41	18.74	21.21	2.20	21.32
18	27.54	0.87	0.98	0.47	10.16	0.25	5.84	0.78	24.68	26.96	4.72	27.37
21	56.94	1.35	1.20	0.59	8.64	0.34	9.29	0.70	30.00	31.58	8.22	32.64
24	60.15	1.61	1.06	0.72	7.20	0.42	10.47	0.74	35.39	36.50	9.32	37.67
27	39.95	1.53	0.80	0.84	10.44	0.32	9.37	0.69	41.28	42.90	8.06	43.65
30	27.37	1.42	0.73	0.99	19.00	0.20	8.28	0.62	46.78	50.77	6.69	51.20
33	17.91	1.41	0.86	1.17	32.52	0.21	8.60	0.56	52.32	61.92	6.24	62.24
36	17.49	1.46	1.22	1.37	49.61	0.34	10.18	0.56	59.96	78.24	6.62	78.52
39	22.40	1.55	1.76	1.57	68.14	0.49	11.95	0.63	71.27	99.10	7.33	99.37
42	26.00	1.66	2.37	1.75	85.89	0.64	13.35	0.75	84.69	121.14	8.02	121.41
45	26.06	1.76	2.92	1.89	101.12	0.76	14.27	0.85	96.89	140.57	8.54	140.83
48	51.81	1.84	3.56	2.06	111.45	0.87	17.12	0.92	106.05	154.50	10.59	154.86

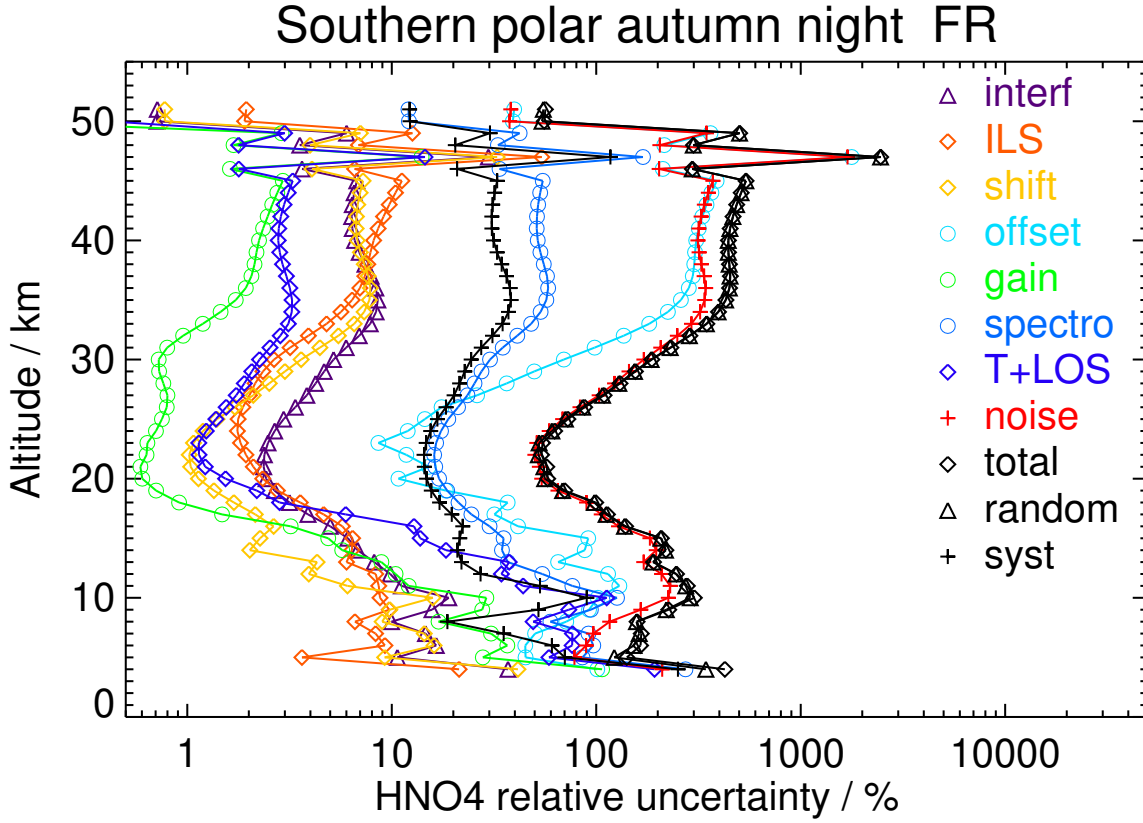


Figure S34: V8H_HNO₄_62 Southern polar autumn night

Table S39: HNO₄ 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)
9	12.22	0.51	1.22	0.24	2.11	0.41	3.62	1.44	13.89	14.38	2.80	14.64
12	8.57	0.51	1.20	0.16	1.17	0.41	3.33	1.39	14.52	14.92	2.07	15.07
15	17.43	0.52	2.79	0.40	0.91	0.35	4.39	1.11	16.89	17.24	4.18	17.74
18	41.94	0.92	3.94	0.79	1.29	0.36	7.31	0.93	19.66	20.07	7.54	21.44
21	74.88	1.66	3.63	1.23	1.93	0.45	12.37	0.70	22.94	23.66	11.89	26.48
24	94.90	1.30	4.17	1.51	2.55	0.53	15.30	0.68	27.74	28.56	14.72	32.13
27	88.67	1.21	4.03	1.64	3.42	0.41	14.56	0.66	32.64	33.33	14.10	36.20
30	73.24	1.44	4.00	1.70	7.04	0.26	12.33	0.59	36.79	37.82	12.09	39.71
33	59.32	1.62	4.16	1.73	15.33	0.24	10.35	0.57	43.23	46.14	10.27	47.27
36	36.88	1.64	4.34	1.74	28.00	0.36	9.08	0.52	54.26	61.28	8.94	61.93
39	13.61	1.60	4.55	1.73	42.79	0.57	8.46	0.49	68.83	81.24	8.16	81.65
42	-2.46	1.55	4.74	1.70	57.23	0.77	8.23	0.50	84.09	101.89	7.79	102.19
45	-8.95	1.52	4.93	1.66	69.41	0.92	8.28	0.53	97.23	119.62	7.77	119.88
48	-21.61	1.49	5.37	1.74	76.46	1.02	5.37	0.52	105.12	130.08	6.37	130.23

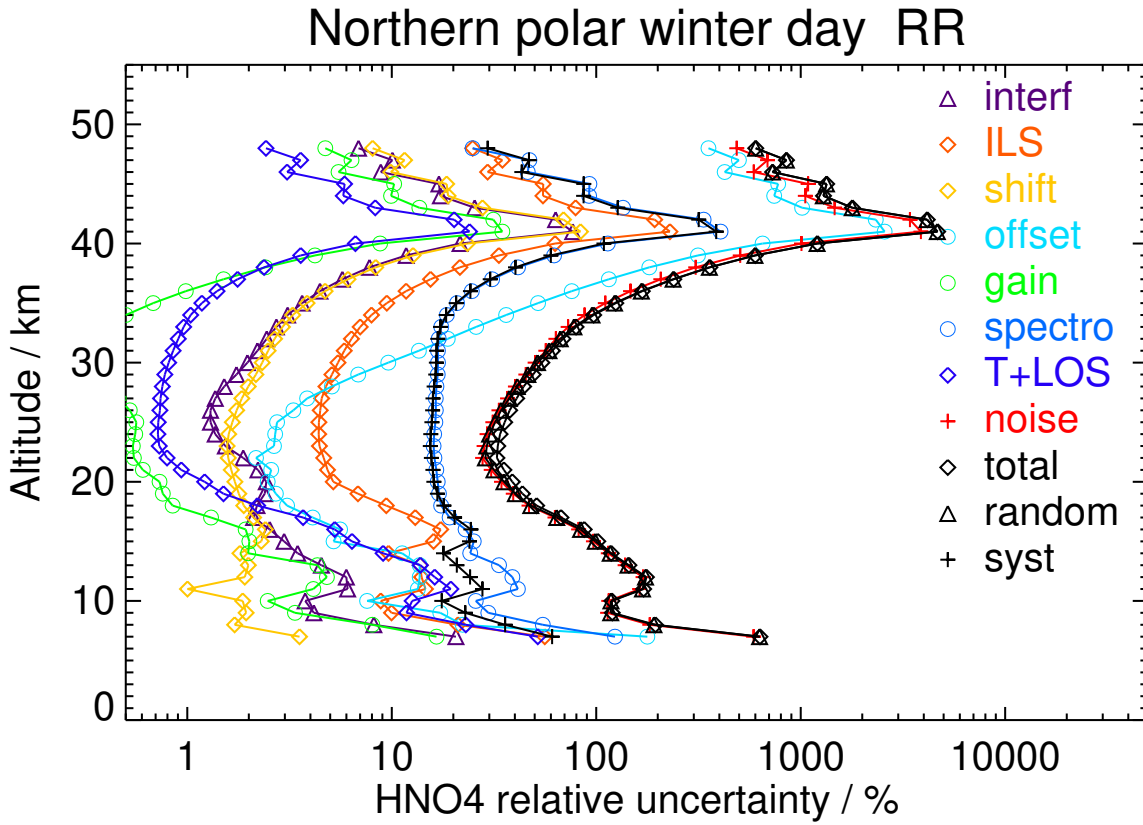


Figure S35: V8R_HNO₄.262 Northern polar winter day

Table S40: HNO₄ 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)
6	10.37	1.06	2.73	0.23	8.58	0.60	6.73	2.72	25.95	28.29	2.87	28.44
9	13.84	0.50	1.03	0.29	1.74	0.32	3.68	1.55	15.29	15.74	2.55	15.95
12	15.05	0.56	1.53	0.15	1.67	0.30	4.18	1.65	16.18	16.69	3.03	16.96
15	14.64	0.56	2.69	0.40	1.12	0.28	3.87	1.18	18.83	19.13	3.76	19.49
18	23.26	0.91	3.53	0.74	1.48	0.22	5.68	0.89	22.25	22.66	5.53	23.33
21	57.70	1.76	3.93	1.16	2.06	0.28	10.62	0.65	25.47	26.21	9.96	28.04
24	92.81	1.40	4.25	1.61	2.66	0.39	15.13	0.67	28.19	29.23	14.14	32.47
27	98.01	1.26	4.22	1.92	3.23	0.37	15.97	0.71	32.59	33.66	14.79	36.76
30	77.05	1.49	3.94	1.82	4.63	0.31	13.16	0.70	34.40	35.23	12.59	37.41
33	51.56	1.75	4.11	1.69	8.44	0.24	10.49	0.69	38.85	40.08	10.39	41.40
36	37.00	1.76	4.33	1.60	15.77	0.28	9.63	0.67	45.12	48.14	9.22	49.01
39	29.35	1.65	4.73	1.56	26.58	0.40	10.07	0.65	53.89	60.49	8.99	61.16
42	32.44	1.56	5.24	1.56	39.59	0.61	10.88	0.63	66.65	77.94	9.30	78.49
45	33.79	1.51	5.94	1.65	52.42	0.83	11.52	0.60	81.38	97.20	9.84	97.69
48	21.34	1.49	6.96	1.80	60.94	0.95	9.70	0.62	91.64	110.31	9.58	110.73
52	66.23	1.54	9.51	2.24	66.02	0.89	10.94	0.84	99.61	119.75	12.64	120.42

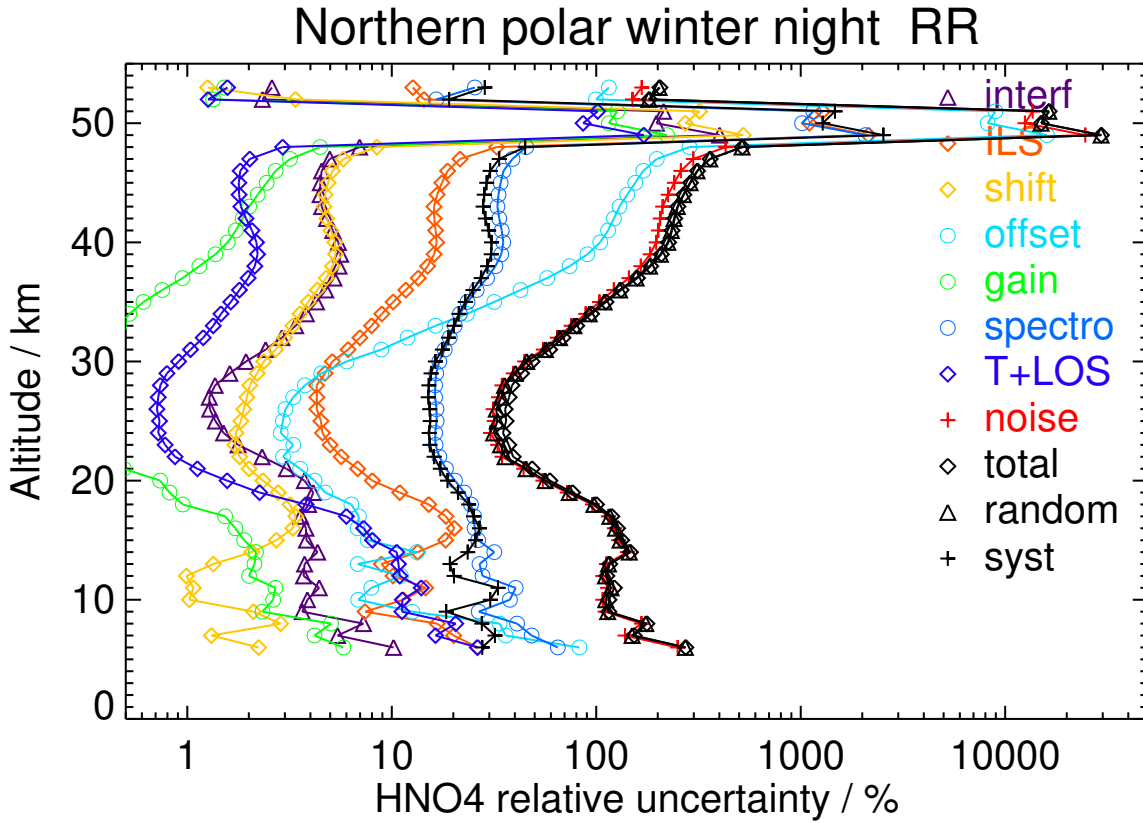


Figure S36: V8R_HNO₄_262 Northern polar winter night

Table S41: HNO₄ 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)
6	15.52	0.95	0.85	0.09	8.30	0.92	2.35	2.65	26.64	28.13	1.58	28.17
9	20.35	0.57	1.11	0.13	1.84	0.50	4.61	1.76	13.57	14.10	3.84	14.61
12	37.75	0.50	1.02	0.15	0.94	0.51	6.25	1.68	15.45	15.86	5.62	16.83
15	52.22	0.69	2.99	0.39	1.32	0.49	8.36	1.39	19.01	19.30	8.51	21.09
18	85.42	0.89	2.68	0.79	1.31	0.59	13.25	1.01	22.67	22.95	13.19	26.47
21	118.95	1.13	2.54	1.07	2.00	0.67	18.01	0.88	26.67	27.04	17.86	32.40
24	116.43	1.32	2.34	1.18	2.95	0.63	18.27	0.91	32.49	32.94	17.96	37.52
27	87.17	1.28	2.16	1.27	4.78	0.45	15.42	0.84	38.50	39.17	14.75	41.86
30	61.33	1.20	2.61	1.47	8.49	0.27	12.19	0.73	44.14	45.30	11.33	46.69
33	37.78	1.14	3.29	1.70	14.42	0.18	9.77	0.60	48.79	51.16	9.02	51.95
36	26.60	1.12	3.85	1.77	22.61	0.17	8.49	0.54	53.57	58.40	7.89	58.93
39	24.87	1.21	4.26	1.58	32.90	0.26	8.26	0.69	60.30	68.94	7.57	69.35
42	24.64	1.45	4.58	1.18	44.73	0.44	8.66	0.99	70.36	83.63	7.67	83.98
45	22.95	1.77	4.91	0.73	56.94	0.62	9.26	1.29	83.15	101.03	7.96	101.35
48	20.99	2.05	5.28	0.38	68.11	0.77	9.76	1.49	95.70	117.73	8.28	118.02
52	39.29	2.38	5.65	0.25	81.30	0.85	12.04	1.68	109.06	136.36	9.86	136.71

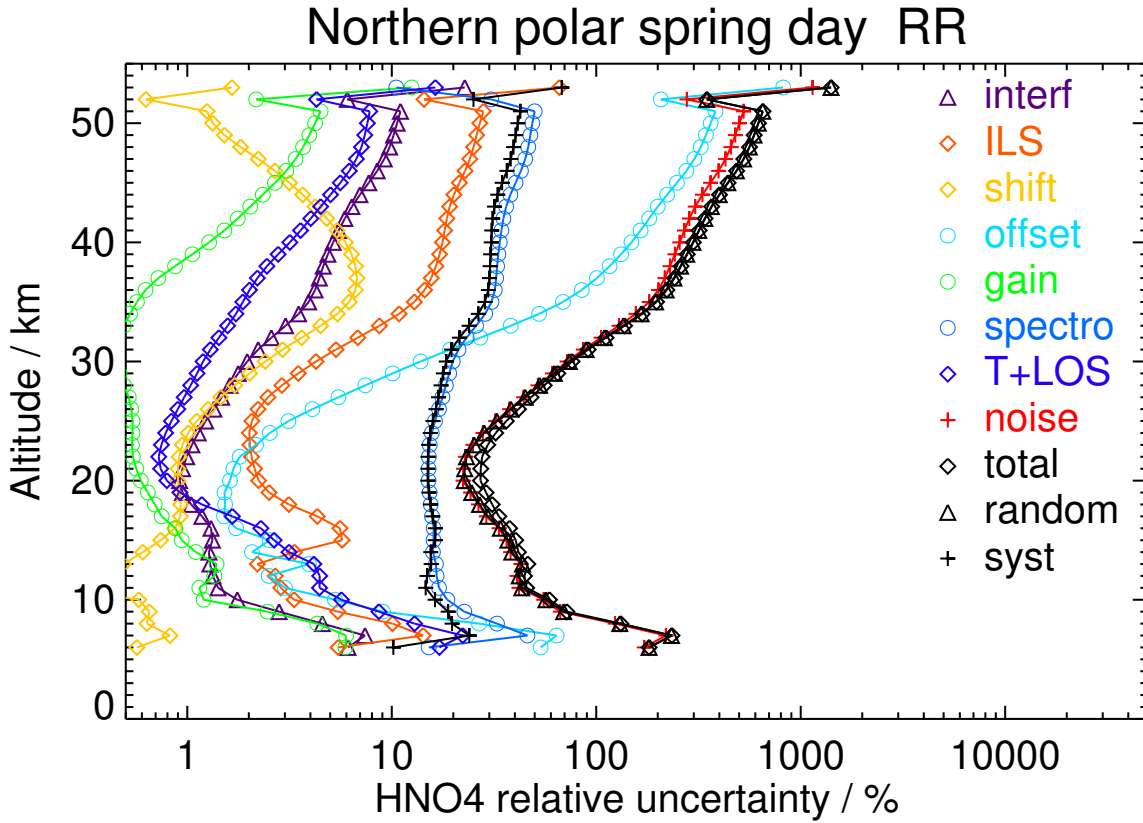


Figure S37: V8R_HNO₄_262 Northern polar spring day

Table S42: HNO₄ 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)
9	22.83	0.63	1.84	0.15	2.25	0.65	6.05	1.78	14.69	15.74	4.13	16.28
12	30.88	0.50	1.12	0.16	1.07	0.49	5.66	1.65	14.72	15.21	4.80	15.95
15	43.37	0.68	2.78	0.33	1.27	0.39	7.39	1.30	18.18	18.60	7.13	19.92
18	72.83	0.89	2.86	0.71	1.34	0.55	12.16	1.02	22.07	22.52	11.85	25.45
21	124.58	1.15	2.70	1.03	2.22	0.60	18.78	0.82	26.41	26.94	18.45	32.65
24	139.91	1.34	2.30	1.16	3.13	0.68	21.23	0.91	31.91	32.47	20.84	38.58
27	110.81	1.30	1.99	1.29	4.96	0.56	18.46	0.92	38.35	38.99	18.03	42.95
30	73.85	1.21	2.59	1.55	8.63	0.29	14.22	0.81	43.57	44.65	13.90	46.76
33	53.11	1.15	3.44	1.83	14.60	0.16	11.08	0.64	48.10	50.46	10.93	51.63
36	40.35	1.12	4.06	1.94	22.98	0.20	9.36	0.54	53.09	58.06	9.22	58.79
39	32.20	1.21	4.37	1.76	33.58	0.33	8.75	0.67	60.26	69.21	8.29	69.71
42	20.11	1.46	4.51	1.35	45.76	0.50	8.77	0.97	70.91	84.64	7.79	85.00
45	4.46	1.80	4.65	0.89	58.19	0.68	8.99	1.27	84.07	102.49	7.57	102.77
48	-7.47	2.09	4.86	0.53	69.40	0.82	9.20	1.50	96.62	119.21	7.54	119.44
52	3.05	2.35	5.37	0.29	79.37	0.83	6.32	1.66	108.23	134.33	6.89	134.50

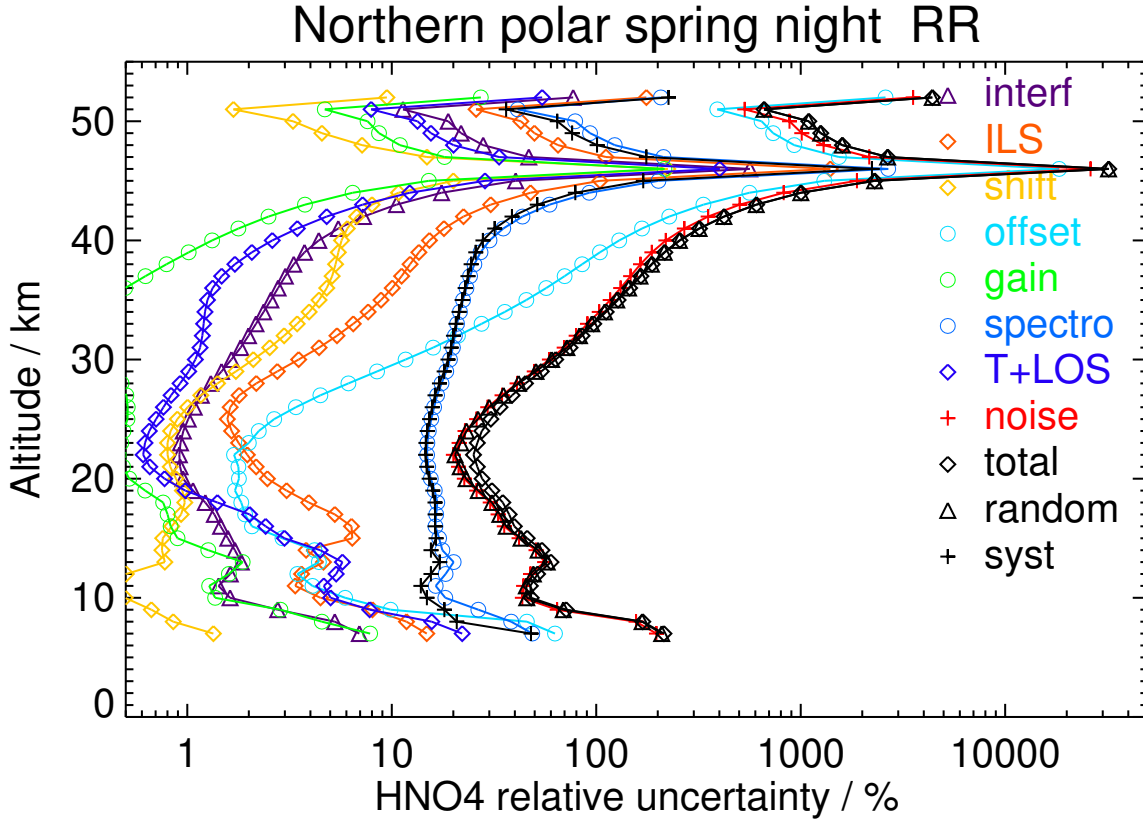


Figure S38: V8R_HNO₄_262 Northern polar spring night

Table S43: HNO₄ 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)
9	55.13	0.94	2.68	0.10	7.96	0.67	10.01	2.87	27.97	29.79	8.68	31.02
12	52.19	0.52	2.08	0.19	1.58	0.54	8.83	1.94	16.37	17.15	7.94	18.90
15	51.34	0.69	1.64	0.21	1.51	0.87	8.93	1.79	17.22	17.90	8.10	19.65
18	96.35	0.89	3.22	0.51	1.26	0.54	14.66	1.09	20.09	20.52	14.55	25.16
21	130.92	1.06	2.96	0.86	1.43	1.04	20.21	0.93	23.25	23.64	20.11	31.04
24	145.58	1.22	3.34	1.11	1.80	1.04	22.46	0.90	26.03	26.53	22.30	34.66
27	139.15	1.19	2.76	1.45	2.53	0.73	21.50	0.88	31.53	32.04	21.19	38.41
30	112.34	1.08	2.80	1.88	3.59	0.45	17.57	0.80	34.04	34.50	17.41	38.65
33	80.70	0.97	3.44	2.13	5.12	0.39	13.36	0.70	38.85	39.48	13.18	41.62
36	56.05	0.90	3.93	1.95	7.93	0.32	9.99	0.60	43.97	44.96	9.80	46.01
39	17.75	1.10	3.96	1.35	13.26	0.20	7.62	0.76	47.13	49.17	7.55	49.75
42	-11.98	1.51	3.75	0.64	21.45	0.37	6.71	1.12	50.94	55.46	6.51	55.84
45	-19.43	1.89	3.91	0.27	32.02	0.63	6.90	1.43	59.26	67.56	6.47	67.87
48	-13.02	2.19	4.50	0.62	43.62	0.85	7.46	1.64	71.63	84.07	7.01	84.36
52	0.21	2.38	5.92	0.91	58.12	1.19	7.99	1.66	90.32	107.60	8.16	107.91
56	-1.54	2.38	7.68	0.97	68.87	1.66	6.16	1.56	104.59	125.34	8.95	125.66

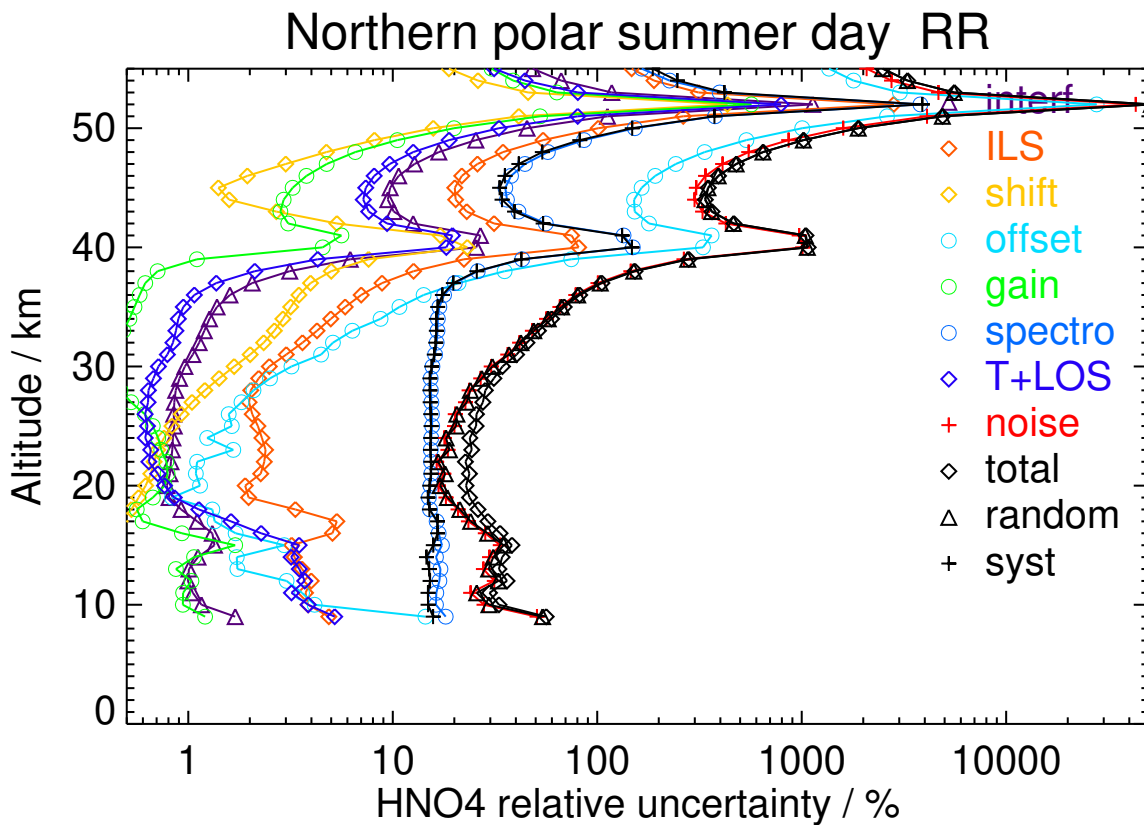


Figure S39: V8R_HNO₄_262 Northern polar summer day

Table S44: HNO₄ 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)
12	40.39	0.94	2.01	0.05	8.62	0.56	7.27	2.58	32.56	34.06	6.26	34.63
15	36.69	0.70	2.00	0.13	1.58	0.36	6.57	1.24	17.78	18.06	6.47	19.19
18	86.92	0.88	3.08	0.48	1.36	0.48	12.77	1.01	20.82	21.10	12.84	24.70
21	113.21	1.07	2.41	0.80	1.70	0.89	18.02	0.93	24.43	24.86	17.76	30.56
24	142.48	1.24	3.24	1.06	2.15	0.77	22.23	0.83	28.13	28.91	21.65	36.12
27	159.53	1.17	2.86	1.38	2.85	0.79	24.03	0.86	33.42	34.38	23.09	41.42
30	124.45	1.07	2.69	1.74	4.18	0.56	19.82	0.90	36.68	37.41	19.20	42.05
33	73.49	1.00	3.25	1.99	6.78	0.35	14.05	0.81	41.43	42.27	13.76	44.45
36	38.79	0.96	3.93	2.01	11.64	0.20	10.30	0.62	46.53	48.24	10.00	49.27
39	23.15	1.05	4.41	1.75	19.31	0.29	8.76	0.56	50.98	54.81	8.25	55.43
42	14.07	1.30	4.74	1.31	29.70	0.59	8.38	0.66	58.02	65.48	7.61	65.92
45	-0.13	1.60	5.14	0.88	41.60	0.87	8.44	0.82	69.85	81.58	7.52	81.93
48	-11.88	1.83	5.68	0.59	53.29	1.08	8.62	0.95	83.54	99.35	7.77	99.66
52	-17.96	1.98	6.54	0.44	66.43	1.25	8.82	1.01	99.72	120.06	8.35	120.35

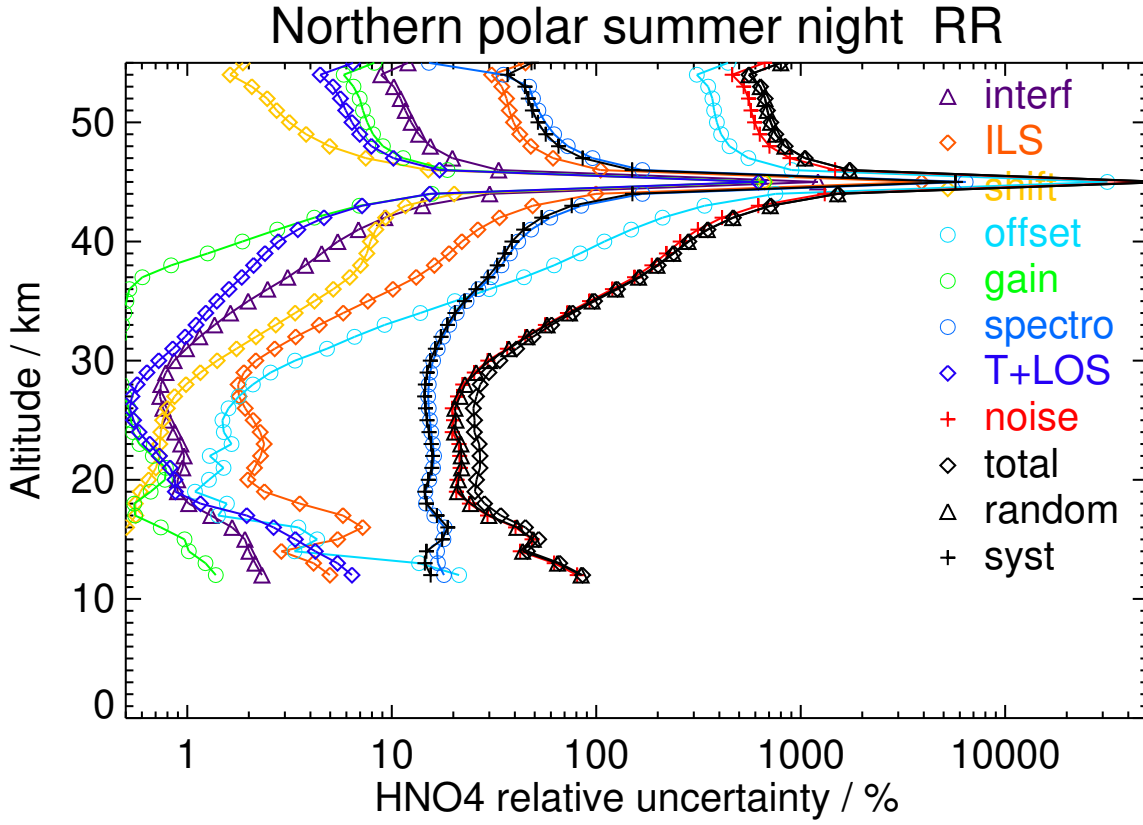


Figure S40: V8R_HNO₄.262 Northern polar summer night

Table S45: HNO₄ 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)
12	14.42	0.80	1.71	0.13	3.59	0.40	5.02	1.85	19.91	20.79	3.06	21.02
15	14.67	0.51	1.92	0.26	1.43	0.25	4.06	1.18	17.88	18.24	3.36	18.54
18	34.86	0.90	2.71	0.58	1.20	0.32	6.37	0.91	21.51	21.85	6.06	22.67
21	57.75	1.45	2.28	0.80	1.98	0.31	9.44	0.65	25.96	26.32	9.11	27.85
24	78.88	1.40	2.58	0.98	3.01	0.28	12.18	0.61	31.59	32.10	11.61	34.14
27	78.05	1.32	2.54	1.14	5.05	0.31	13.04	0.63	37.51	38.40	11.76	40.16
30	52.85	1.38	2.81	1.33	9.71	0.31	11.61	0.62	42.39	43.99	10.11	45.14
33	27.48	1.45	3.33	1.50	17.71	0.27	9.77	0.56	48.16	51.68	8.58	52.39
36	7.48	1.44	3.81	1.61	28.63	0.31	9.03	0.51	56.38	63.55	7.84	64.03
39	-4.52	1.42	4.23	1.62	41.32	0.45	9.24	0.53	67.83	79.74	7.66	80.11
42	-9.62	1.44	4.59	1.56	54.42	0.62	9.75	0.62	81.57	98.37	7.77	98.67
45	-11.87	1.49	4.92	1.46	66.47	0.78	10.22	0.71	95.24	116.44	7.96	116.71
48	-9.56	1.55	5.40	1.41	73.22	0.87	9.58	0.75	103.78	127.23	8.49	127.51

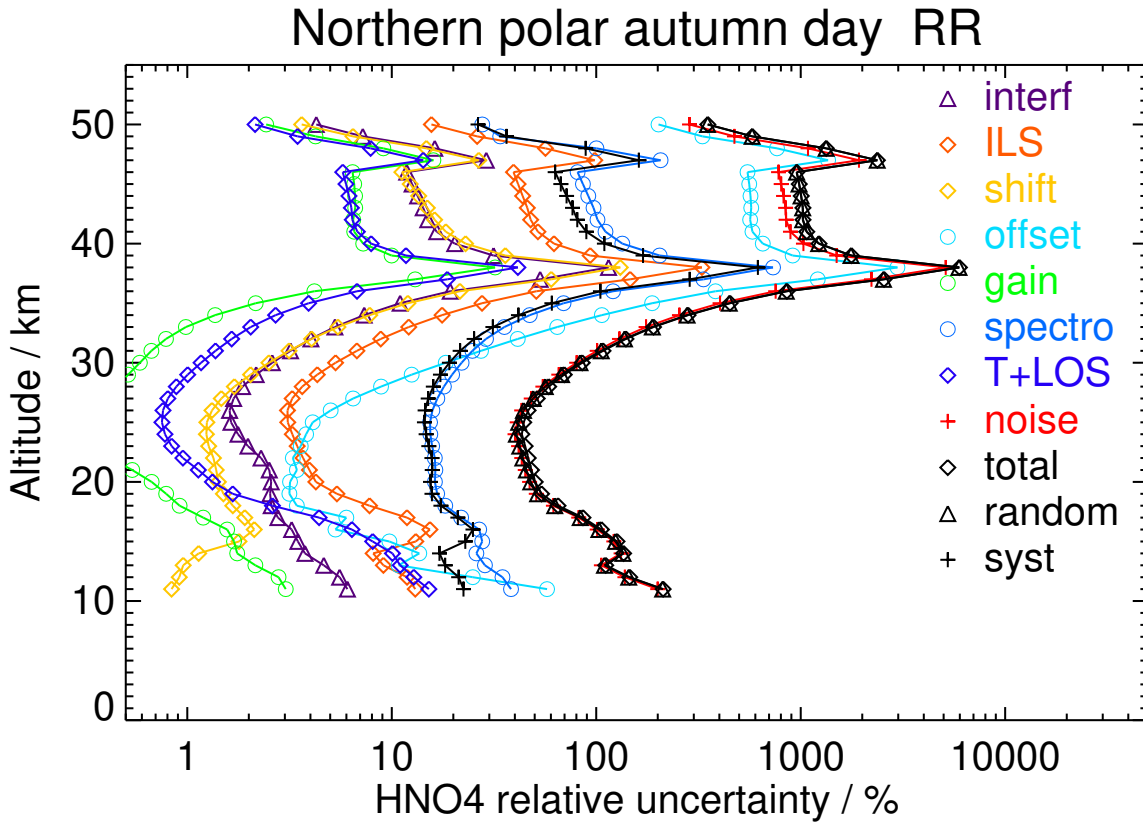


Figure S41: V8R_HNO₄_262 Northern polar autumn day

Table S46: HNO4 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)
12	12.08	0.77	1.93	0.16	3.18	0.54	4.97	1.82	18.41	19.36	2.68	19.54
15	20.13	0.50	2.26	0.29	1.32	0.31	4.45	1.22	17.58	17.96	3.92	18.38
18	31.15	0.94	2.58	0.60	1.25	0.38	6.10	0.92	21.57	21.91	5.74	22.65
21	59.09	1.57	2.50	0.81	2.01	0.28	9.79	0.64	25.85	26.32	9.23	27.89
24	84.87	1.43	2.69	0.98	3.08	0.29	13.66	0.61	31.51	32.23	12.69	34.64
27	90.33	1.34	2.49	1.15	5.01	0.34	14.69	0.67	37.47	38.47	13.23	40.68
30	59.42	1.45	2.64	1.36	9.36	0.27	12.54	0.66	41.92	43.47	11.12	44.87
33	28.56	1.55	3.20	1.56	16.86	0.22	9.87	0.58	47.60	50.84	8.86	51.60
36	13.42	1.53	3.73	1.68	27.27	0.31	8.41	0.50	55.43	62.03	7.61	62.50
39	-3.41	1.48	4.15	1.67	39.59	0.49	8.01	0.53	66.24	77.40	7.14	77.73
42	-18.12	1.48	4.49	1.54	52.49	0.69	8.12	0.66	79.36	95.37	7.06	95.63
45	-24.74	1.55	4.77	1.36	64.63	0.87	8.38	0.80	93.05	113.50	7.15	113.73
48	-35.44	1.67	5.16	1.20	72.88	1.03	7.39	0.92	103.12	126.44	6.84	126.62
52	34.82	1.88	5.82	0.75	76.63	1.19	15.41	1.05	110.30	134.80	12.06	135.33

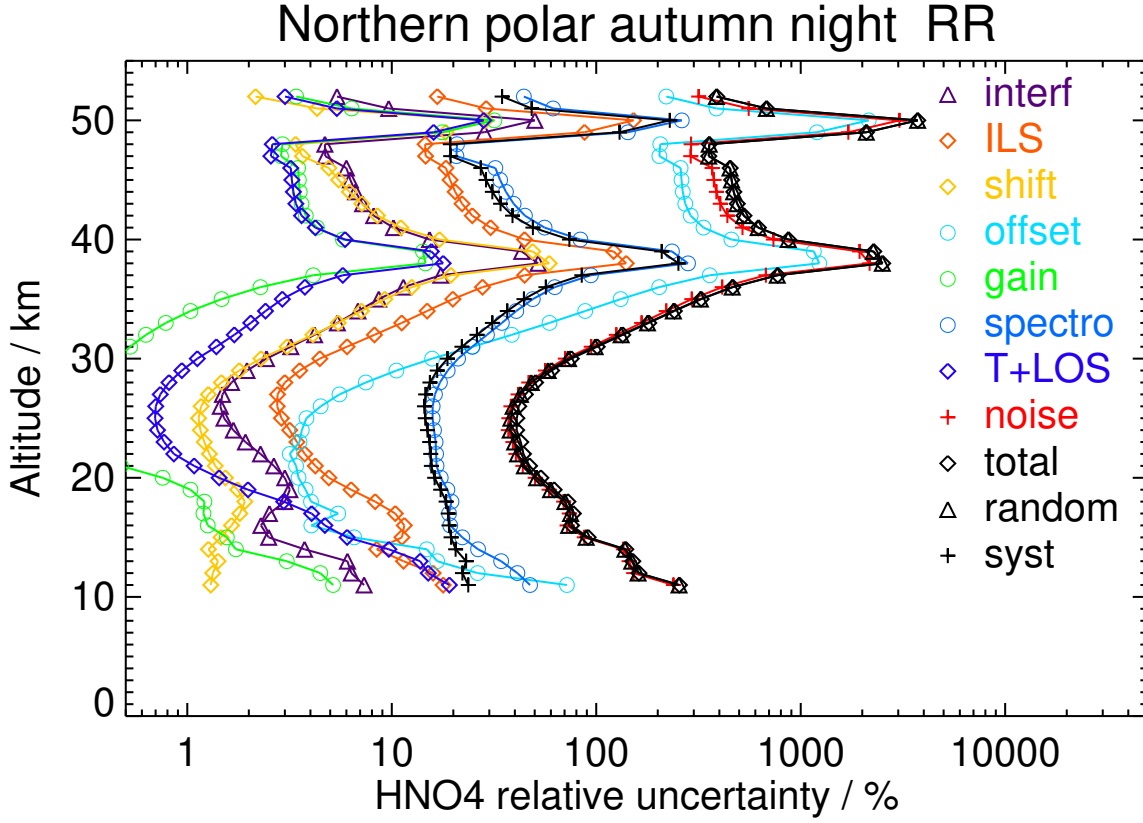


Figure S42: V8R.HNO4.262 Northern polar autumn night

Table S47: HNO₄ 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)
6	19.23	1.03	2.65	0.23	8.02	1.32	7.90	2.38	25.67	28.20	2.45	28.31
9	19.19	0.56	1.13	0.29	2.36	0.40	4.27	1.56	14.91	15.45	3.41	15.82
12	17.57	0.53	1.63	0.15	1.45	0.47	5.01	1.64	14.63	15.45	2.89	15.72
15	13.24	0.56	2.47	0.27	1.17	0.29	4.15	1.13	17.16	17.47	3.95	17.91
18	33.91	0.76	3.22	0.60	1.19	0.32	6.81	0.86	20.57	20.93	6.71	21.98
21	82.30	1.12	3.41	1.01	1.73	0.33	13.16	0.67	24.14	24.68	12.81	27.80
24	124.21	1.29	3.80	1.36	2.53	0.51	19.47	0.69	27.91	28.60	19.11	34.39
27	149.33	1.18	3.37	1.63	3.42	0.58	21.96	0.77	33.57	34.21	21.61	40.46
30	123.95	1.13	3.19	1.89	5.10	0.46	19.20	0.80	36.76	37.42	19.01	41.97
33	83.97	1.18	3.63	2.00	9.40	0.33	14.64	0.73	41.30	42.59	14.61	45.03
36	51.34	1.21	4.16	1.95	17.17	0.21	11.28	0.64	46.34	49.67	11.22	50.92
39	23.37	1.28	4.53	1.79	28.31	0.23	9.65	0.65	54.51	61.70	9.24	62.39
42	4.01	1.41	4.76	1.57	41.60	0.42	9.16	0.76	66.76	78.93	8.26	79.37
45	-9.91	1.54	5.04	1.39	54.93	0.62	9.11	0.86	81.39	98.46	7.88	98.77
48	-20.41	1.64	5.38	1.24	66.10	0.79	9.24	0.92	94.49	115.57	7.86	115.83
52	-115.17	1.84	5.83	0.64	73.64	1.01	7.65	1.09	103.93	127.59	6.73	127.77

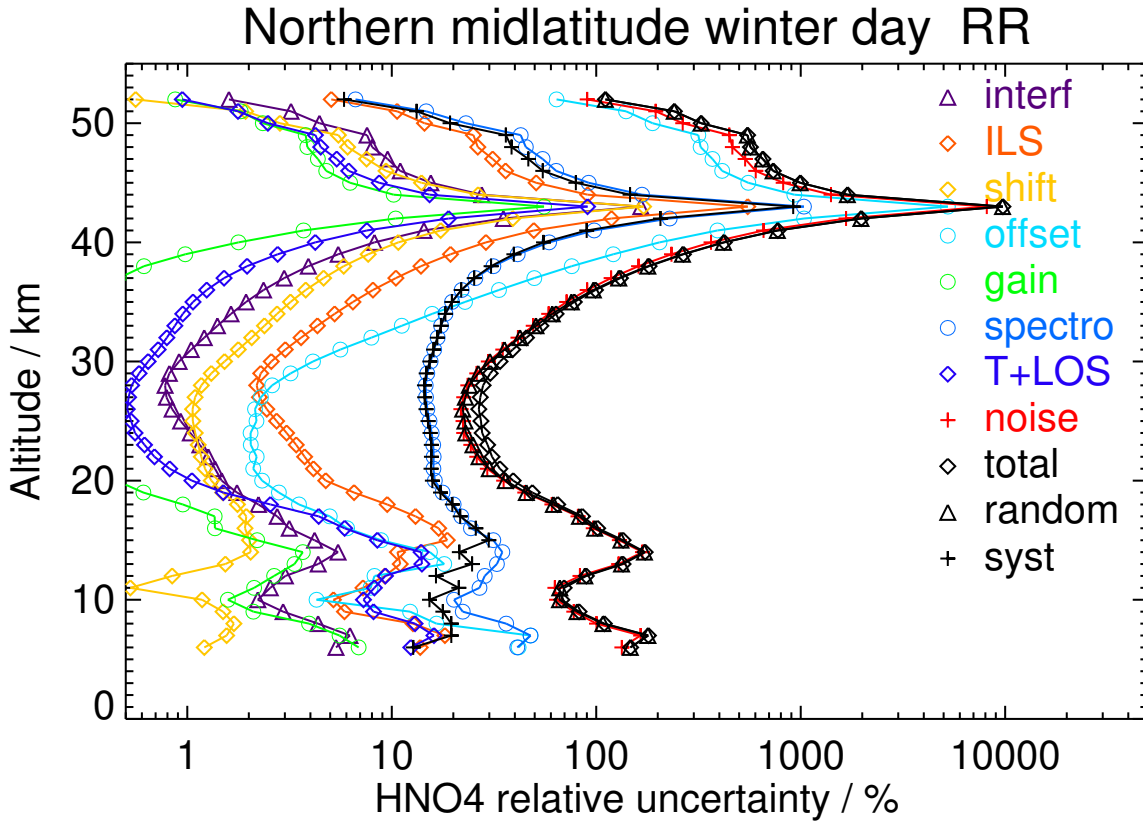


Figure S43: V8R_HNO₄_262 Northern midlatitude winter day

Table S48: HNO₄ 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)
6	40.54	1.07	3.26	0.24	8.53	1.02	9.47	2.37	26.10	28.93	5.04	29.36
9	17.40	0.53	1.06	0.32	2.45	0.53	4.49	1.51	14.20	14.85	3.37	15.23
12	20.41	0.53	1.38	0.14	1.33	0.44	5.12	1.55	14.64	15.39	3.18	15.71
15	14.20	0.55	1.86	0.23	1.16	0.34	3.88	1.17	17.30	17.65	3.06	17.92
18	33.08	0.75	3.32	0.55	1.19	0.22	6.82	0.85	20.86	21.22	6.71	22.26
21	83.28	1.13	3.64	0.96	1.75	0.37	13.96	0.69	24.43	24.92	13.77	28.47
24	151.25	1.30	3.82	1.33	2.68	0.53	22.50	0.70	28.23	28.80	22.35	36.46
27	176.68	1.22	2.94	1.63	3.54	0.69	25.46	0.87	34.16	34.79	25.13	42.92
30	129.79	1.17	2.72	1.94	5.02	0.52	21.06	0.92	37.22	38.00	20.59	43.22
33	78.31	1.19	3.39	2.05	8.64	0.41	15.11	0.78	41.32	42.59	14.63	45.03
36	41.17	1.21	4.02	1.93	15.26	0.36	11.32	0.66	45.50	48.30	10.96	49.53
39	20.35	1.32	4.28	1.62	25.29	0.33	10.19	0.77	52.17	58.30	9.45	59.06
42	14.60	1.51	4.45	1.30	37.92	0.38	10.75	0.95	62.91	73.84	9.17	74.40
45	13.25	1.66	4.81	1.11	51.07	0.50	11.75	1.06	77.25	93.02	9.42	93.50
48	14.32	1.73	5.33	1.03	62.77	0.66	12.50	1.07	91.24	111.17	9.79	111.60
52	74.60	1.80	6.14	0.75	72.30	0.80	16.64	1.15	102.74	126.19	13.36	126.89

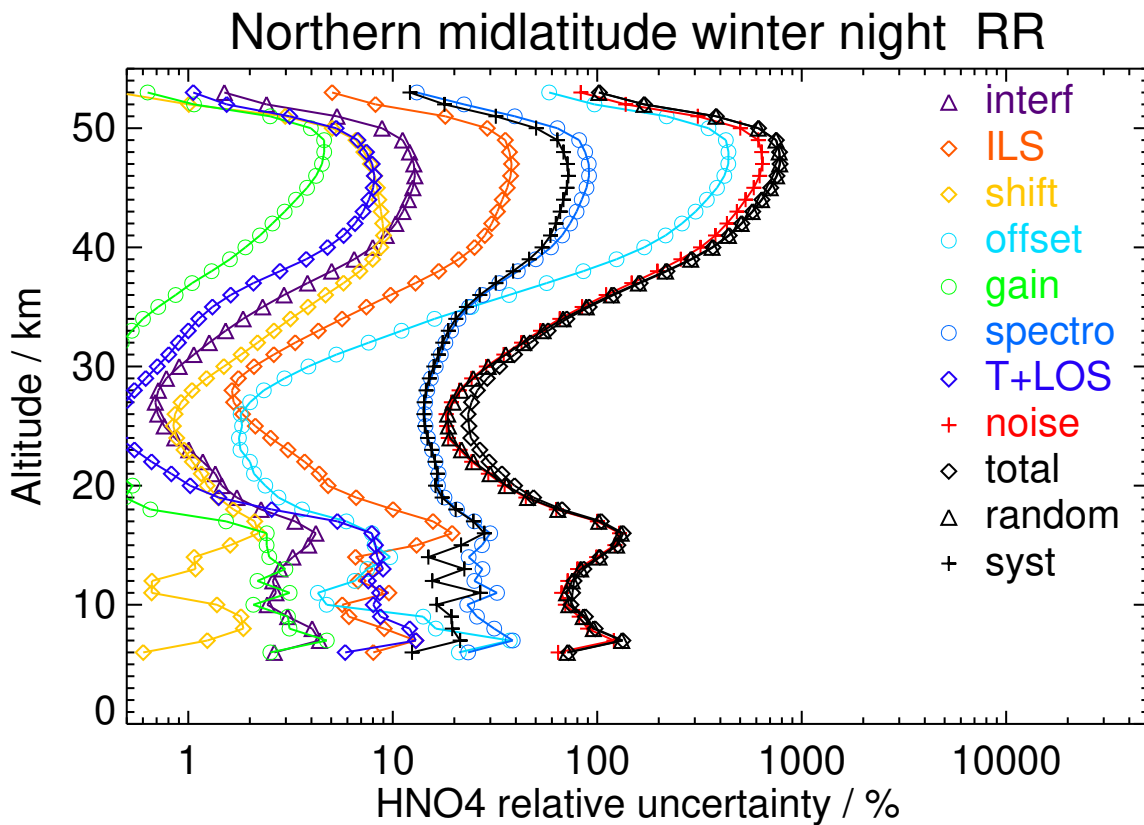


Figure S44: V8R_HNO₄_262 Northern midlatitude winter night

Table S49: HNO₄ error budget for Northern midlatitude spring day. All uncertainties are 1 σ .

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)
9	41.72	0.68	2.09	0.21	3.19	0.72	8.52	2.32	17.14	18.63	6.37	19.68
12	39.26	0.52	1.83	0.13	1.31	0.61	7.59	1.88	14.67	15.70	5.97	16.80
15	34.71	0.55	2.33	0.23	1.38	0.58	6.74	1.41	17.63	18.31	5.56	19.14
18	67.24	0.76	2.97	0.54	1.20	0.49	11.68	0.96	21.25	21.84	11.11	24.50
21	138.76	1.12	2.96	0.90	1.85	0.68	20.81	0.81	24.90	25.34	20.65	32.69
24	179.54	1.30	2.96	1.24	2.71	0.94	27.24	0.92	29.74	30.33	26.97	40.59
27	177.35	1.22	2.55	1.61	3.68	0.85	27.09	1.00	34.81	35.52	26.64	44.40
30	138.43	1.18	2.87	2.04	5.51	0.58	22.24	0.96	38.95	39.78	21.79	45.36
33	97.13	1.21	3.69	2.27	9.33	0.39	16.64	0.82	43.10	44.46	16.30	47.36
36	58.19	1.19	4.29	2.20	15.88	0.26	12.18	0.68	47.27	50.14	12.11	51.58
39	27.81	1.27	4.53	1.86	25.45	0.22	9.56	0.72	53.38	59.36	9.52	60.12
42	12.79	1.47	4.63	1.41	37.44	0.36	8.59	0.90	63.46	73.90	8.23	74.36
45	7.95	1.70	4.84	1.03	50.09	0.55	8.51	1.09	77.22	92.26	7.78	92.59
48	6.52	1.85	5.19	0.79	61.58	0.71	8.63	1.17	90.95	110.05	7.77	110.32
52	-0.87	1.95	5.77	0.62	73.71	0.91	9.12	1.16	104.68	128.26	7.94	128.51

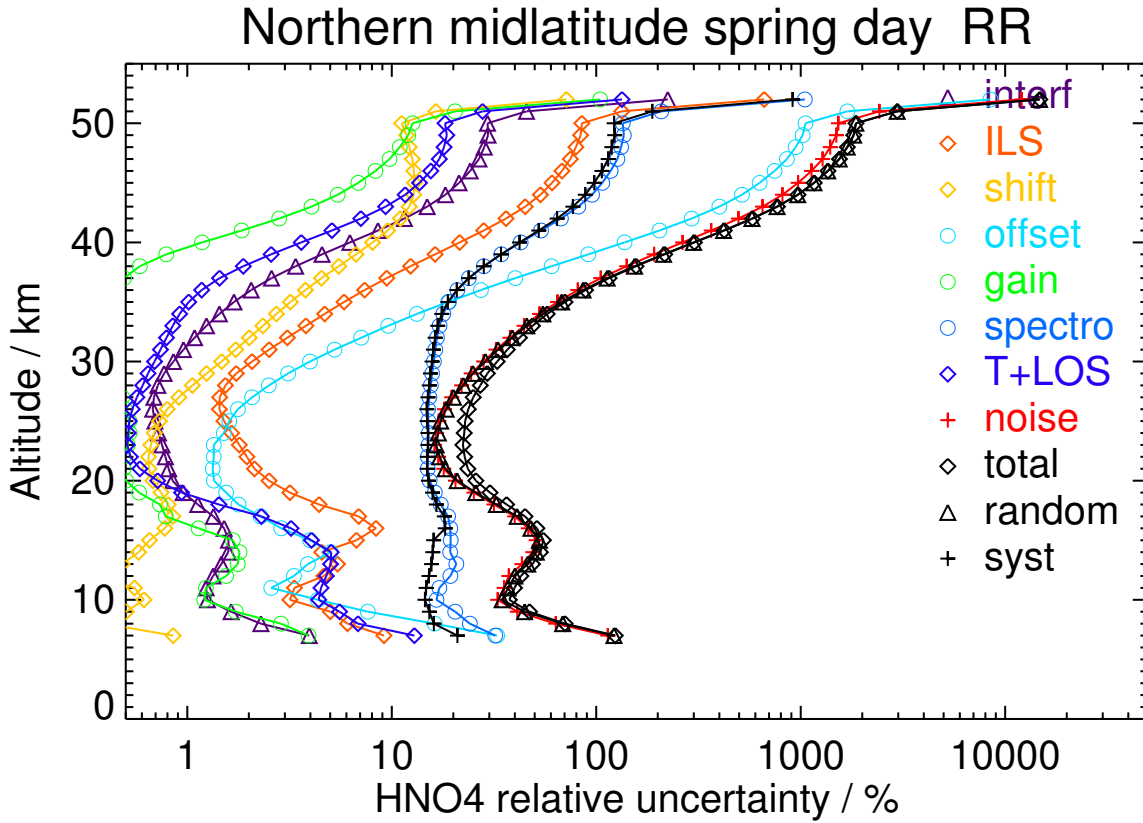


Figure S45: V8R_HNO₄_262 Northern midlatitude spring day

Table S50: HNO₄ 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)
9	43.59	0.67	2.28	0.22	3.38	0.57	7.99	2.25	16.93	18.30	6.17	19.31
12	36.91	0.52	1.39	0.10	1.04	0.48	6.96	1.70	14.86	15.49	5.99	16.61
15	44.65	0.55	2.65	0.24	1.44	0.60	8.05	1.42	17.69	18.37	7.23	19.74
18	85.38	0.75	3.15	0.58	1.21	0.54	13.86	0.99	20.96	21.52	13.48	25.39
21	154.89	1.11	3.16	0.92	1.80	0.84	23.85	0.90	24.58	25.23	23.52	34.49
24	201.54	1.29	3.07	1.26	2.68	1.05	30.30	1.01	29.22	30.01	29.89	42.35
27	188.58	1.22	2.40	1.62	3.68	0.90	29.55	1.10	34.81	35.77	28.83	45.94
30	144.17	1.20	2.72	2.03	5.59	0.56	23.70	1.03	38.99	39.97	23.01	46.12
33	98.90	1.22	3.67	2.28	9.35	0.38	17.35	0.86	43.24	44.66	16.88	47.74
36	58.33	1.20	4.31	2.25	15.78	0.26	12.86	0.69	47.14	50.06	12.49	51.59
39	30.15	1.26	4.46	1.91	25.20	0.22	10.59	0.71	53.17	59.19	9.83	60.00
42	8.04	1.50	4.38	1.41	37.11	0.32	9.89	0.93	63.14	73.60	8.36	74.07
45	-8.27	1.76	4.45	0.99	49.78	0.46	9.86	1.16	76.77	91.85	7.69	92.17
48	-20.31	1.94	4.75	0.75	61.35	0.60	9.97	1.28	90.61	109.75	7.52	110.01
52	-29.25	2.02	5.39	0.65	72.98	0.77	10.76	1.25	104.21	127.57	8.03	127.82

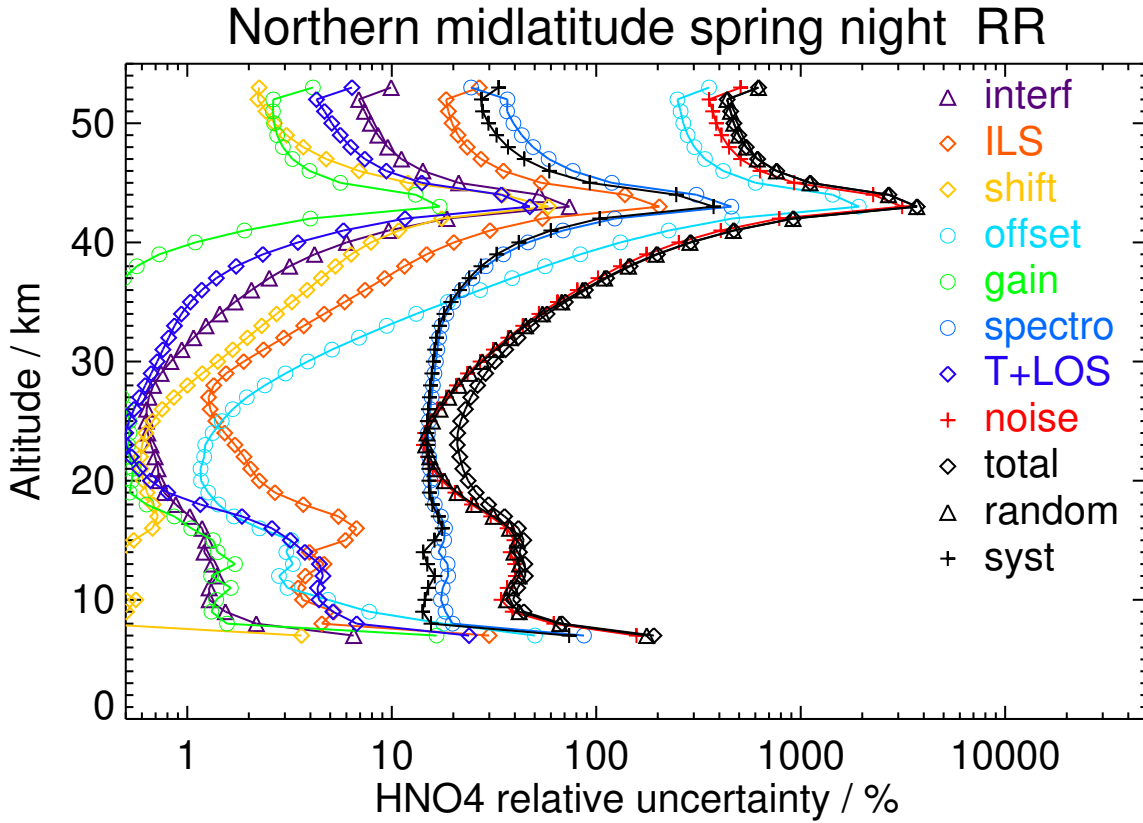


Figure S46: V8R_HNO₄_262 Northern midlatitude spring night

Table S51: HNO₄ 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)
9	47.81	0.80	2.93	0.33	3.54	1.69	12.19	2.81	17.37	18.87	11.27	21.98
12	35.01	0.55	1.22	0.26	0.75	0.58	6.54	1.69	13.50	14.07	5.71	15.19
15	19.53	0.59	1.17	0.14	1.00	0.71	4.39	1.52	17.06	17.47	3.30	17.78
18	23.36	0.78	2.47	0.28	1.19	0.33	6.26	0.95	21.95	22.34	5.57	23.03
21	113.78	1.11	3.73	0.66	1.70	0.37	18.03	0.88	24.81	25.23	17.99	30.98
24	207.75	1.27	3.95	1.19	2.40	0.99	31.06	0.85	27.66	28.09	31.10	41.90
27	256.65	1.18	2.91	1.69	3.13	1.20	37.00	1.08	33.15	33.65	36.89	49.93
30	216.69	1.16	2.27	2.15	4.38	0.85	32.49	1.23	36.46	37.05	32.32	49.16
33	136.74	1.21	2.97	2.36	7.21	0.56	23.25	1.15	41.09	41.99	23.13	47.94
36	63.18	1.19	4.02	2.25	12.37	0.36	15.25	0.88	45.26	47.16	15.28	49.57
39	22.12	1.24	4.49	1.89	20.60	0.24	10.97	0.81	50.28	54.60	10.85	55.66
42	9.71	1.44	4.58	1.40	31.77	0.24	9.93	1.07	58.46	66.85	9.09	67.46
45	7.95	1.68	4.76	0.99	44.24	0.35	10.28	1.32	71.35	84.31	8.62	84.75
48	10.38	1.82	5.26	0.75	56.05	0.52	10.68	1.38	85.67	102.73	8.56	103.09
52	18.83	1.86	6.22	0.67	68.55	0.85	10.77	1.22	100.86	122.30	8.70	122.61

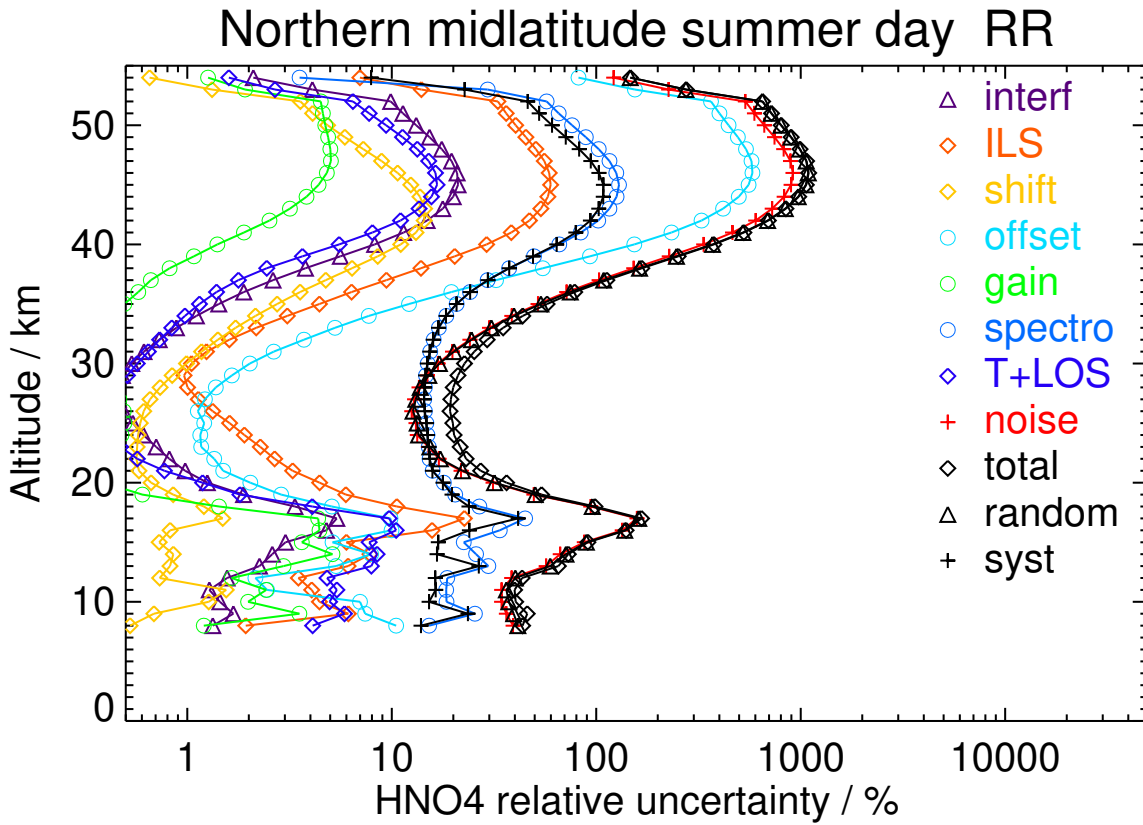


Figure S47: V8R_HNO₄_262 Northern midlatitude summer day

Table S52: HNO₄ 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)
9	46.01	0.83	3.32	0.34	5.57	1.50	12.98	2.74	21.58	23.94	10.66	26.21
12	31.73	0.56	1.91	0.35	1.30	0.49	7.14	2.11	15.03	16.17	5.10	16.95
15	23.54	0.61	2.10	0.17	1.23	0.61	5.97	1.57	18.08	18.98	3.38	19.28
18	34.26	0.75	2.97	0.28	1.08	0.32	7.47	0.92	21.86	22.18	7.30	23.35
21	111.03	1.10	3.88	0.67	1.61	0.34	18.49	0.86	24.96	25.31	18.56	31.39
24	222.59	1.26	4.06	1.18	2.33	0.96	32.30	0.85	28.61	28.98	32.38	43.45
27	265.30	1.19	2.93	1.67	3.12	1.17	38.22	1.12	33.74	34.22	38.12	51.23
30	216.29	1.17	2.39	2.13	4.36	0.81	32.98	1.29	37.01	37.68	32.72	49.91
33	137.64	1.21	3.08	2.34	7.13	0.53	23.45	1.17	41.65	42.60	23.21	48.51
36	66.90	1.19	3.84	2.25	12.10	0.38	15.47	0.90	45.73	47.54	15.46	49.99
39	19.76	1.22	3.91	1.89	19.99	0.33	11.21	0.90	50.55	54.57	11.11	55.69
42	-2.54	1.43	3.55	1.37	30.73	0.36	10.52	1.31	58.17	66.07	9.62	66.76
45	-9.49	1.69	3.48	0.94	42.88	0.40	11.31	1.69	70.67	83.00	9.50	83.54
48	-12.89	1.84	3.93	0.73	54.49	0.43	11.82	1.80	84.87	101.22	9.44	101.66
52	-12.14	1.87	5.09	0.68	66.91	0.61	11.70	1.60	100.05	120.72	9.14	121.06

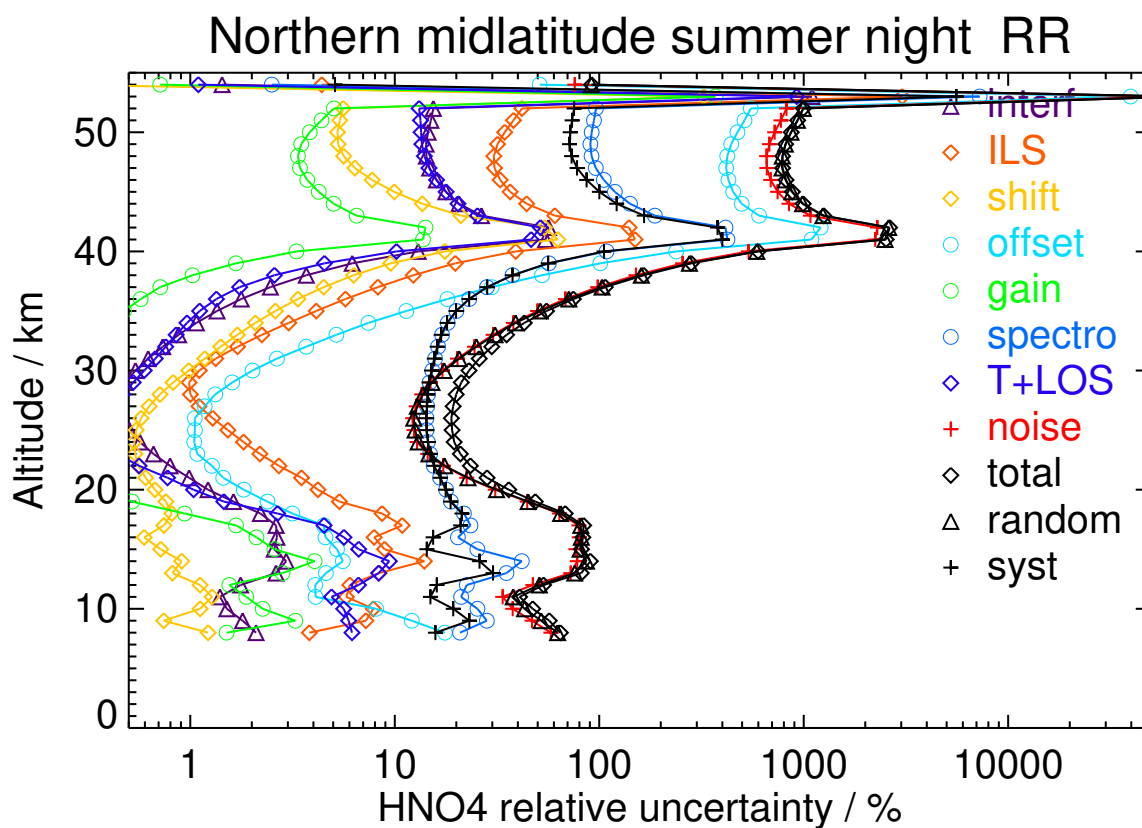


Figure S48: V8R_HNO₄_262 Northern midlatitude summer night

Table S53: HNO₄ 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)
9	24.57	0.78	2.55	0.34	4.25	0.83	8.91	2.40	18.63	20.02	7.56	21.40
12	24.92	0.57	1.19	0.21	0.80	0.44	5.84	1.61	14.68	15.25	4.72	15.96
15	16.90	0.58	1.54	0.14	1.00	0.43	4.25	1.28	17.20	17.65	2.84	17.88
18	29.75	0.77	2.21	0.30	1.14	0.30	6.10	0.87	21.22	21.58	5.45	22.26
21	80.18	1.14	2.97	0.66	1.73	0.32	13.62	0.71	25.02	25.47	13.32	28.74
24	158.98	1.29	3.37	1.10	2.54	0.56	23.30	0.70	28.47	28.94	23.17	37.07
27	191.50	1.19	2.85	1.49	3.65	0.80	27.59	0.89	34.90	35.41	27.43	44.79
30	161.66	1.15	2.71	1.83	5.81	0.69	24.76	0.98	38.68	39.50	24.42	46.44
33	106.70	1.20	3.35	2.04	10.49	0.49	19.24	0.89	43.53	45.20	18.71	48.91
36	62.28	1.22	4.13	2.09	18.29	0.31	14.60	0.72	48.27	52.02	13.99	53.86
39	32.88	1.27	4.57	1.95	28.97	0.22	12.14	0.69	56.14	63.56	11.16	64.54
42	12.62	1.41	4.77	1.69	41.56	0.32	11.41	0.88	67.96	80.06	9.76	80.65
45	4.54	1.59	4.95	1.41	54.21	0.46	11.42	1.10	82.36	98.98	9.18	99.41
48	2.07	1.72	5.26	1.21	65.25	0.62	11.49	1.20	95.61	116.12	8.96	116.47
52	-48.74	1.93	5.80	0.85	74.55	0.88	1.81	1.33	106.50	130.03	6.13	130.17

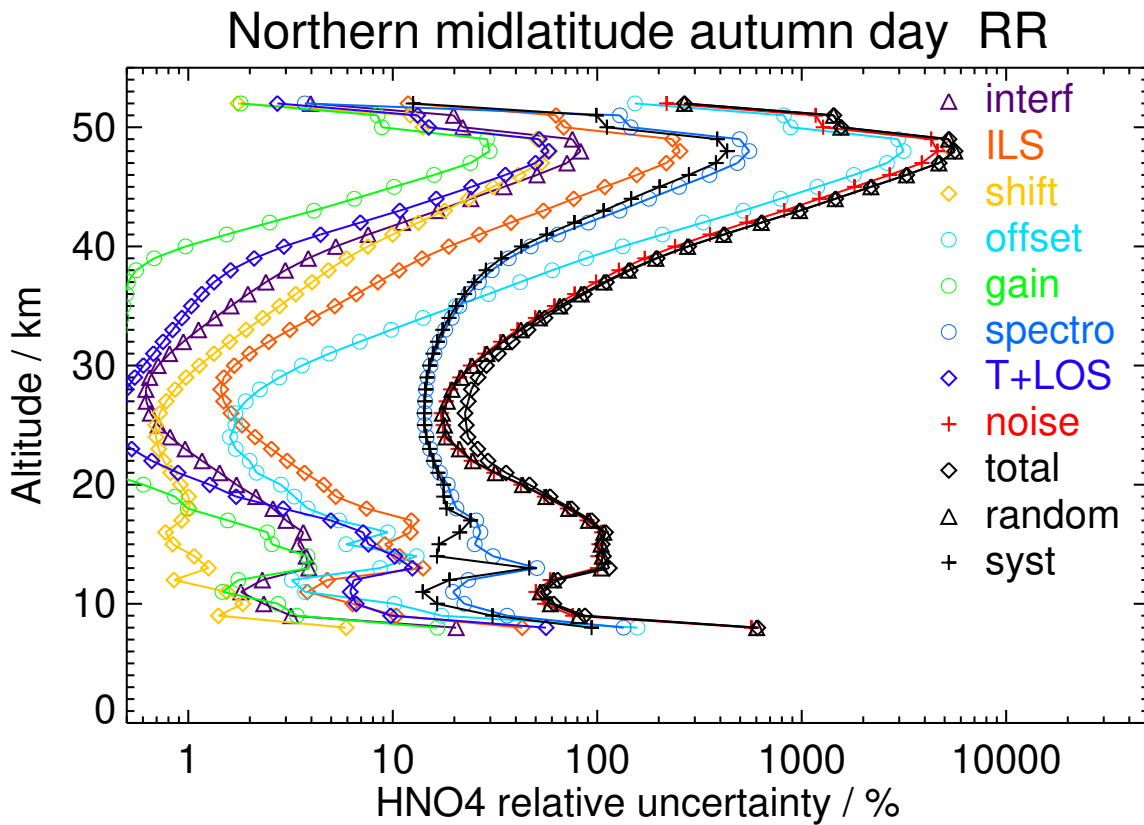


Figure S49: V8R_HNO₄_262 Northern midlatitude autumn day

Table S54: HNO₄ 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)
9	36.51	0.68	2.62	0.42	3.40	0.87	9.61	2.36	16.30	17.51	8.78	19.58
12	20.31	0.57	1.32	0.15	0.87	0.38	5.66	1.65	14.69	15.25	4.58	15.92
15	17.90	0.58	1.69	0.12	1.14	0.33	4.12	1.20	17.74	18.07	3.37	18.38
18	29.05	0.77	2.05	0.32	1.20	0.35	5.48	0.83	21.44	21.71	5.06	22.29
21	82.13	1.14	3.21	0.67	1.78	0.24	13.95	0.70	25.07	25.44	13.86	28.97
24	169.18	1.30	3.45	1.10	2.64	0.54	24.52	0.72	28.88	29.45	24.31	38.19
27	192.83	1.20	2.65	1.48	3.70	0.81	28.27	0.93	35.06	35.76	27.85	45.32
30	151.92	1.16	2.60	1.82	5.75	0.65	24.45	0.99	38.89	39.80	23.92	46.44
33	104.73	1.21	3.38	2.06	10.20	0.44	18.62	0.88	43.76	45.32	18.16	48.82
36	62.14	1.22	4.17	2.13	17.57	0.28	14.05	0.70	48.26	51.66	13.80	53.47
39	35.21	1.26	4.54	1.98	27.76	0.21	11.74	0.67	55.56	62.41	11.31	63.42
42	26.24	1.42	4.64	1.67	39.98	0.29	11.36	0.90	66.61	78.01	10.23	78.68
45	22.66	1.62	4.75	1.36	52.54	0.42	11.77	1.17	80.60	96.57	9.91	97.08
48	21.14	1.77	5.07	1.16	63.73	0.55	12.11	1.29	94.01	113.93	9.84	114.36
52	63.66	1.94	5.44	0.86	74.25	0.70	14.48	1.41	105.77	129.71	11.00	130.18

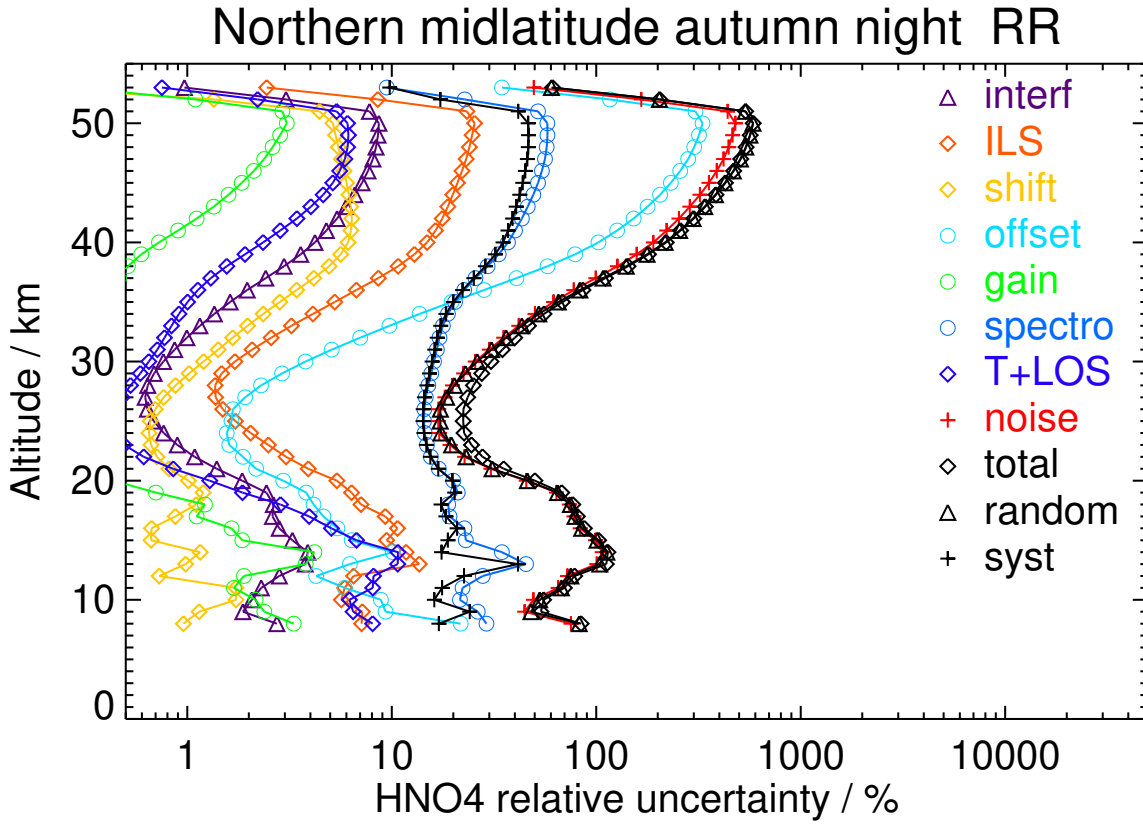


Figure S50: V8R.HNO₄.262 Northern midlatitude autumn night

Table S55: HNO₄ 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)
9	38.38	0.91	1.42	0.19	7.46	0.42	7.02	2.29	27.45	28.96	5.31	29.44
12	16.08	0.63	1.13	0.26	2.00	0.45	3.86	1.61	16.32	16.81	2.67	17.02
15	8.57	0.59	2.31	0.11	1.69	0.22	4.76	1.46	18.87	19.35	3.88	19.74
18	13.04	0.77	1.83	0.21	1.46	0.21	4.21	0.80	24.47	24.73	3.44	24.96
21	56.27	1.08	3.29	0.57	1.87	0.31	11.10	0.80	26.46	26.87	10.86	28.99
24	145.27	1.26	4.17	1.16	2.51	0.68	22.28	0.77	29.38	30.01	22.05	37.24
27	211.07	1.13	3.69	1.82	3.44	0.87	29.70	0.84	33.60	34.29	29.44	45.19
30	192.37	0.97	3.06	2.39	4.77	0.68	27.76	1.06	38.20	38.87	27.55	47.65
33	117.53	0.91	3.44	2.63	7.41	0.44	20.41	1.02	41.83	42.84	20.17	47.35
36	51.62	0.94	4.05	2.41	12.63	0.26	13.83	0.78	45.38	47.46	13.46	49.33
39	15.61	1.13	4.18	1.94	21.20	0.25	10.16	0.75	49.74	54.38	9.62	55.23
42	-0.54	1.43	4.14	1.43	32.63	0.43	8.90	1.01	58.40	67.18	7.94	67.65
45	-2.89	1.68	4.36	1.04	45.50	0.60	9.01	1.24	71.49	85.03	7.52	85.36
48	1.69	1.83	4.90	0.85	57.81	0.74	9.44	1.33	86.07	103.97	7.68	104.25
52	11.47	1.87	5.81	0.79	70.63	0.87	9.76	1.26	101.52	123.95	8.12	124.22

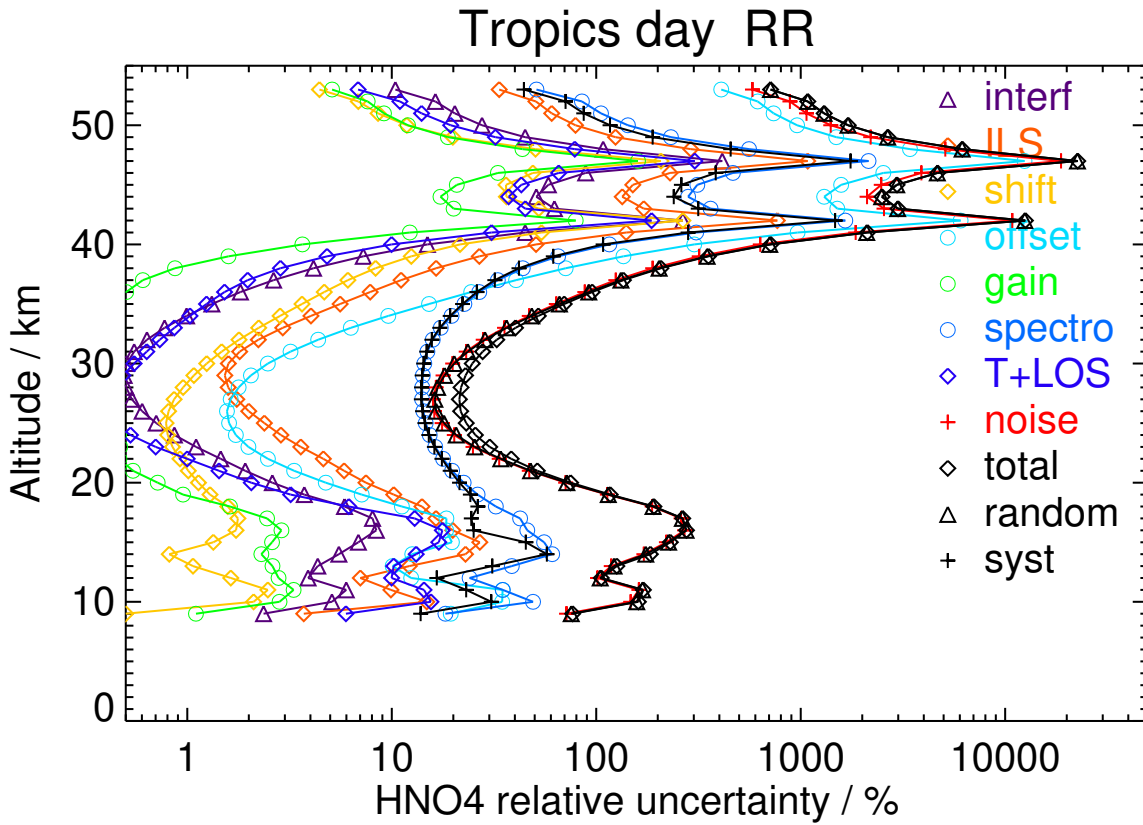


Figure S51: V8R_HNO₄_262 Tropics day

Table S56: HNO₄ 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)
9	12.53	0.85	1.43	0.75	6.45	0.59	3.77	2.02	28.09	29.08	2.59	29.20
12	23.00	0.62	1.23	0.30	1.80	0.39	5.04	1.75	16.33	16.97	3.55	17.34
15	10.84	0.60	2.35	0.14	1.52	0.33	5.22	1.59	19.72	20.31	3.81	20.67
18	5.56	0.78	1.88	0.21	1.45	0.24	4.14	0.83	25.39	25.68	3.06	25.86
21	61.16	1.06	3.46	0.56	1.85	0.25	11.92	0.89	27.72	28.11	11.75	30.47
24	158.00	1.22	4.16	1.18	2.44	0.64	23.93	0.80	30.34	30.94	23.73	38.99
27	222.87	1.09	3.60	1.82	3.35	0.85	30.82	0.90	34.46	35.03	30.67	46.56
30	194.74	0.92	3.17	2.36	4.77	0.70	28.10	1.14	39.49	40.06	28.02	48.89
33	116.87	0.86	3.63	2.58	7.54	0.46	20.21	1.08	43.12	44.06	20.13	48.44
36	49.56	0.91	4.15	2.42	12.95	0.24	13.11	0.83	46.66	48.68	13.09	50.41
39	8.74	1.10	4.18	2.02	21.59	0.22	8.86	0.79	51.05	55.62	8.99	56.34
42	-10.06	1.35	4.08	1.56	32.91	0.45	7.09	1.05	59.95	68.54	7.18	68.92
45	-20.08	1.57	4.32	1.23	45.63	0.65	6.70	1.27	72.93	86.18	6.68	86.44
48	-25.25	1.70	4.88	1.04	57.84	0.80	6.67	1.35	87.35	104.91	6.74	105.12
52	-24.51	1.77	5.79	0.97	70.60	0.96	6.52	1.28	102.78	124.82	7.09	125.02

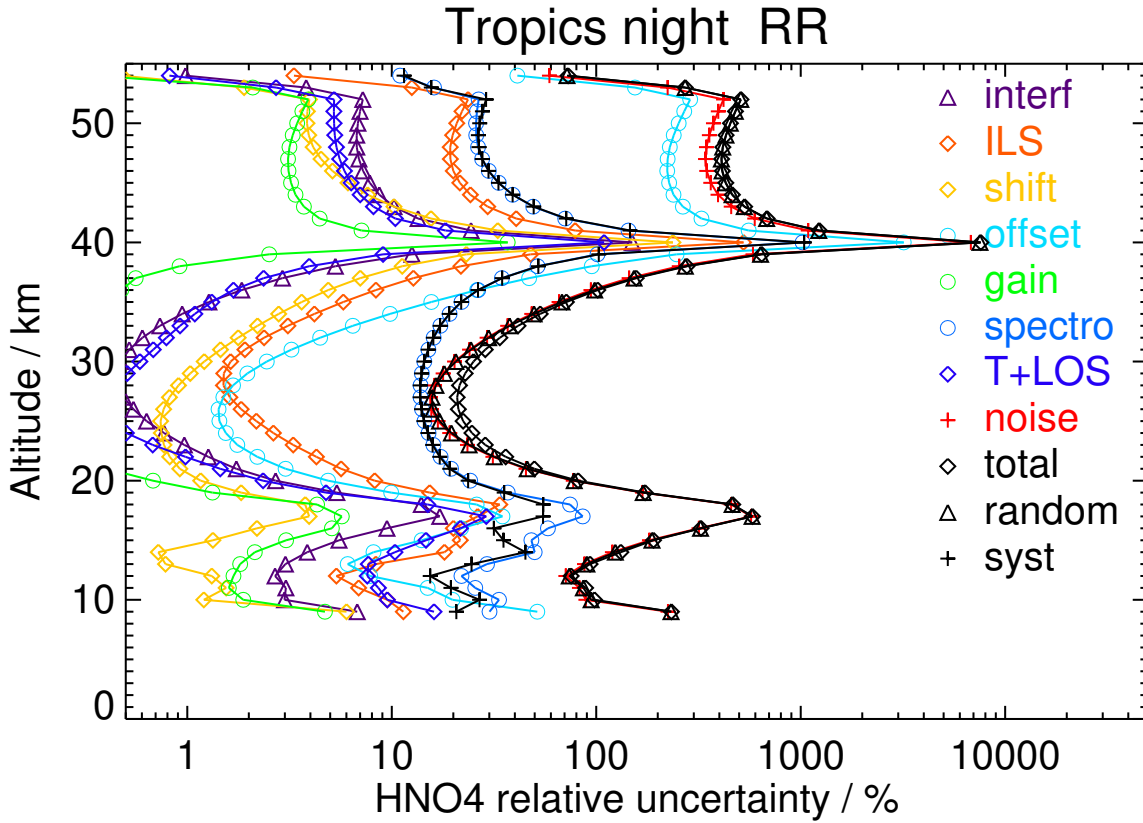


Figure S52: V8R_HNO₄.262 Tropics night

Table S57: HNO₄ 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)
6	4.88	0.93	1.27	0.22	7.01	0.72	4.91	2.05	22.75	24.38	1.93	24.46
9	8.22	0.54	0.93	0.36	1.58	0.53	3.44	1.62	14.73	15.24	1.84	15.35
12	17.37	0.56	1.19	0.18	1.50	0.71	5.13	1.75	15.69	16.46	3.03	16.74
15	7.22	0.57	1.91	0.26	1.15	0.38	3.42	1.12	18.65	18.91	2.90	19.14
18	24.62	0.80	2.49	0.57	1.33	0.26	5.11	0.77	22.79	23.00	5.10	23.56
21	58.57	1.19	2.64	0.90	2.15	0.27	9.78	0.57	27.17	27.56	9.42	29.12
24	92.41	1.37	2.56	1.11	3.60	0.26	14.09	0.65	33.35	34.00	13.33	36.52
27	88.55	1.32	2.39	1.24	6.81	0.32	15.04	0.76	40.51	41.55	14.02	43.85
30	73.06	1.26	2.74	1.41	12.79	0.27	13.98	0.73	46.39	48.59	12.69	50.22
33	60.02	1.23	3.36	1.58	21.75	0.22	12.91	0.64	52.29	57.11	11.28	58.22
36	45.83	1.24	3.96	1.64	32.90	0.27	12.35	0.65	59.34	68.33	10.39	69.11
39	29.31	1.33	4.40	1.55	45.37	0.38	12.34	0.86	69.71	83.63	9.96	84.22
42	14.06	1.51	4.70	1.30	58.24	0.50	12.70	1.19	82.33	101.31	9.85	101.78
45	15.31	1.74	4.98	1.05	69.82	0.61	13.45	1.52	95.11	118.45	10.08	118.88
48	-4.93	1.95	5.15	0.80	80.06	0.68	14.32	1.75	106.71	133.89	10.53	134.30
52	-24.70	2.23	5.27	0.39	82.28	0.72	6.56	2.09	111.68	138.83	6.94	139.00

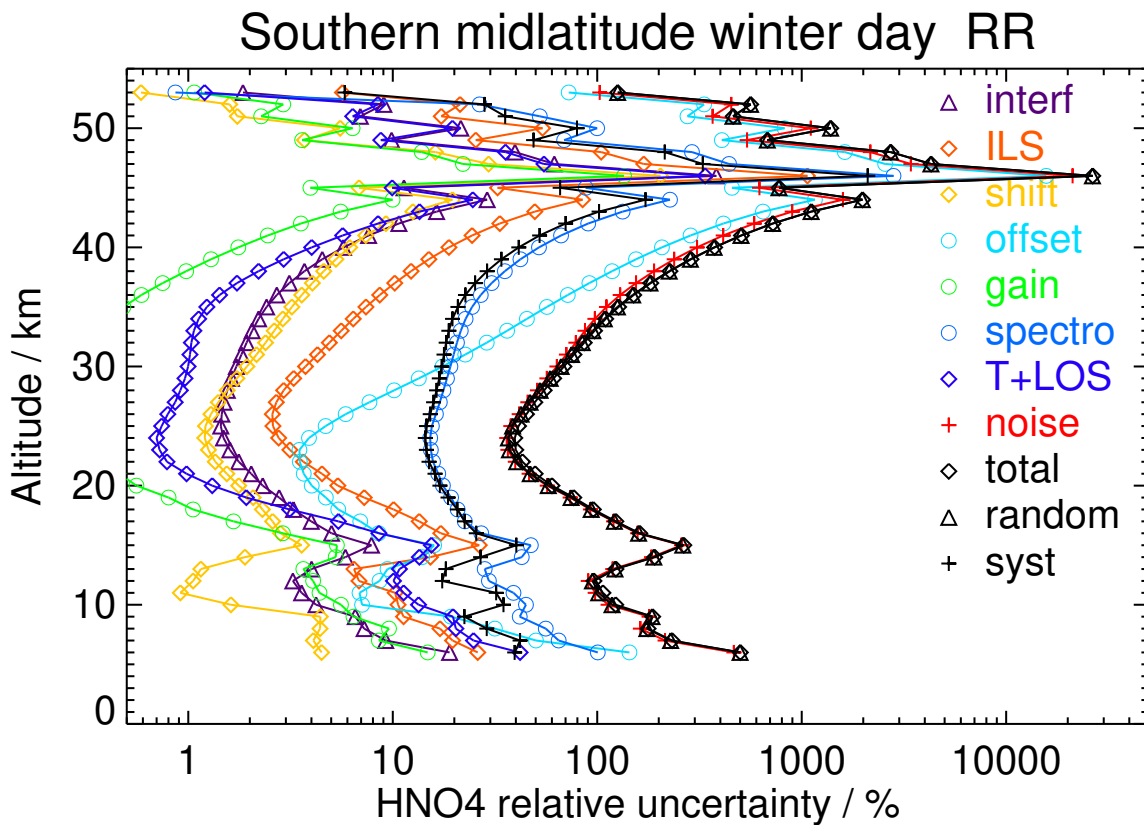


Figure S53: V8R_HNO₄_262 Southern midlatitude winter day

Table S58: HNO₄ 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)
6	12.89	0.97	2.03	0.28	7.08	1.11	6.67	2.54	23.44	25.50	2.59	25.63
9	12.75	0.56	1.37	0.41	1.67	0.67	4.71	1.54	14.91	15.51	3.44	15.89
12	14.33	0.56	1.29	0.18	1.66	0.54	5.06	1.70	15.41	16.28	2.43	16.46
15	17.56	0.57	2.19	0.23	1.09	0.30	4.74	1.17	18.24	18.53	4.41	19.05
18	28.15	0.79	2.23	0.54	1.27	0.32	5.73	0.84	22.41	22.70	5.30	23.31
21	55.77	1.17	2.43	0.87	2.06	0.25	9.47	0.61	27.02	27.40	9.03	28.85
24	88.82	1.36	2.56	1.08	3.49	0.24	13.07	0.61	32.44	33.03	12.45	35.29
27	83.91	1.30	2.43	1.20	6.51	0.31	13.84	0.69	40.34	41.24	13.05	43.25
30	65.12	1.24	2.80	1.37	12.21	0.29	12.72	0.67	45.46	47.41	11.87	48.88
33	49.70	1.23	3.43	1.55	20.82	0.25	11.63	0.58	51.32	55.73	10.58	56.73
36	38.03	1.25	4.05	1.63	31.85	0.25	11.27	0.57	58.22	66.76	9.76	67.47
39	28.39	1.32	4.54	1.56	44.45	0.32	11.51	0.73	68.58	82.14	9.43	82.68
42	27.04	1.47	4.92	1.38	57.51	0.40	11.98	0.99	81.47	100.15	9.38	100.59
45	33.50	1.66	5.27	1.19	68.62	0.41	13.09	1.25	93.78	116.63	10.24	117.08
48	28.64	1.83	5.61	1.00	77.63	0.48	13.24	1.45	104.16	130.34	10.11	130.73
52	-36.15	2.14	6.21	0.49	83.03	0.68	7.42	1.84	111.77	139.41	7.40	139.61

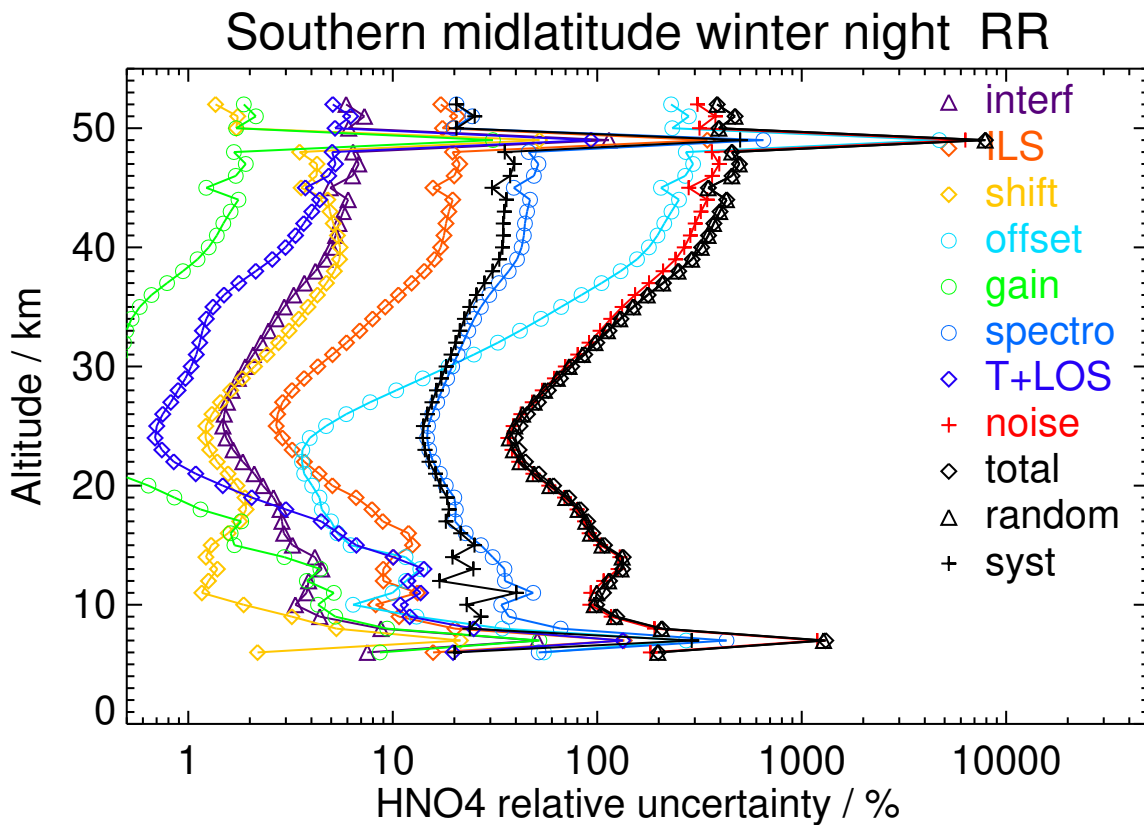


Figure S54: V8R_HNO₄_262 Southern midlatitude winter night

Table S59: HNO₄ 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)
6	-7.95	1.02	2.09	0.31	7.46	0.79	5.71	2.56	24.96	26.64	3.71	26.90
9	17.99	0.55	1.35	0.42	1.74	0.60	4.73	1.68	14.79	15.48	3.15	15.80
12	33.14	0.56	1.91	0.15	1.42	0.61	6.77	1.81	15.31	16.40	4.57	17.02
15	31.71	0.55	2.93	0.19	1.05	0.47	7.59	1.29	18.09	18.85	6.44	19.92
18	79.10	0.75	3.75	0.56	1.20	0.47	13.07	1.03	20.98	21.66	12.64	25.08
21	143.57	1.09	3.73	1.03	1.53	0.75	22.24	0.86	23.98	24.49	22.12	33.00
24	210.90	1.23	4.03	1.42	2.34	1.07	31.01	0.92	27.73	28.38	30.86	41.93
27	215.28	1.14	3.35	1.76	3.17	1.06	32.16	1.08	33.20	33.85	31.92	46.53
30	167.21	1.14	3.20	2.07	4.73	0.72	26.42	1.06	37.23	37.89	26.23	46.08
33	110.37	1.21	3.78	2.24	8.65	0.51	19.61	0.91	42.46	43.67	19.40	47.79
36	72.22	1.21	4.34	2.18	15.31	0.36	14.58	0.71	47.17	49.90	14.43	51.94
39	48.16	1.25	4.50	1.90	24.95	0.24	11.58	0.69	53.88	59.64	11.37	60.71
42	26.95	1.41	4.47	1.49	36.87	0.29	10.17	0.88	64.07	74.15	9.68	74.78
45	12.84	1.62	4.53	1.12	49.39	0.45	9.70	1.11	77.74	92.33	8.90	92.76
48	6.94	1.77	4.80	0.86	60.80	0.62	9.56	1.24	91.60	110.15	8.64	110.49
52	4.32	1.86	5.36	0.68	72.34	0.82	10.04	1.27	105.13	127.81	9.21	128.14

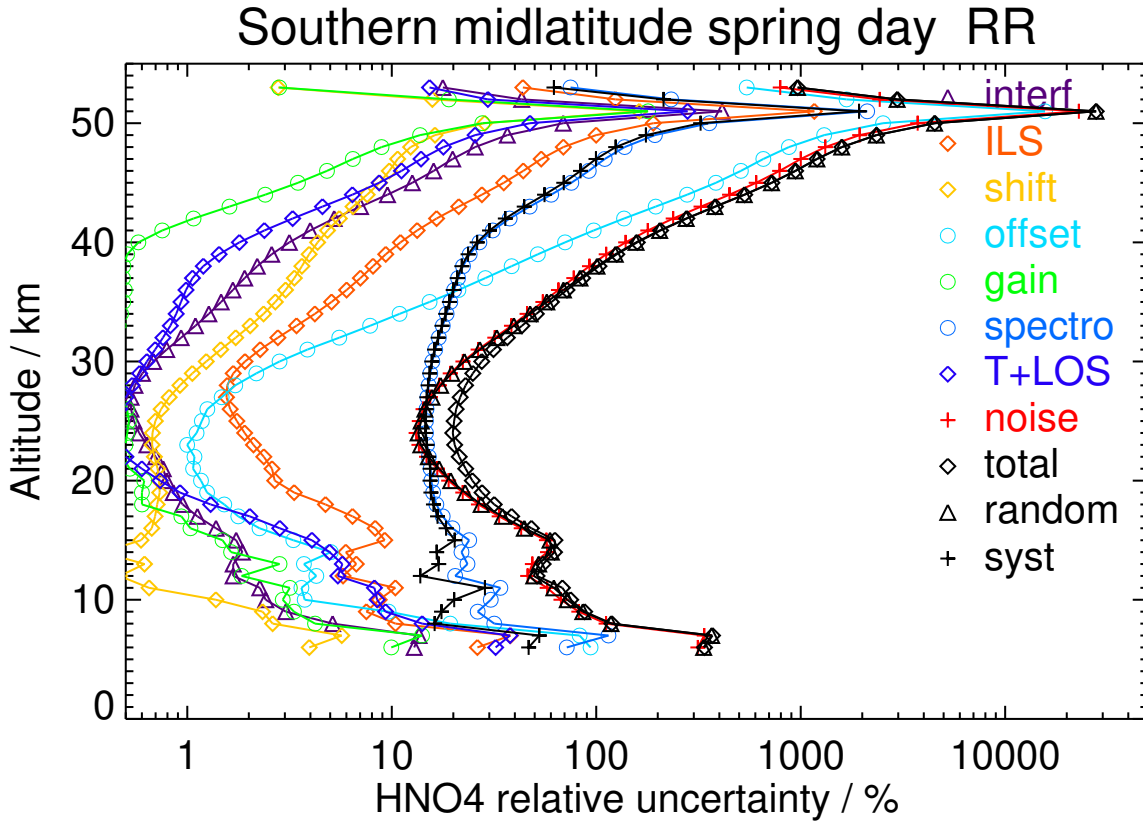


Figure S55: V8R_HNO₄_262 Southern midlatitude spring day

Table S60: HNO₄ 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)
6	-7.26	0.90	1.47	0.24	6.58	0.91	3.88	2.13	22.53	23.92	1.38	23.96
9	24.48	0.57	1.32	0.45	1.57	0.71	5.62	1.78	15.10	15.86	4.07	16.38
12	22.68	0.58	2.04	0.19	2.02	0.85	6.65	2.07	15.48	16.81	3.87	17.25
15	30.60	0.57	3.00	0.18	1.25	0.45	6.76	1.32	18.53	19.14	5.96	20.05
18	63.49	0.77	3.45	0.51	1.29	0.43	12.42	0.95	22.05	22.97	11.32	25.61
21	140.71	1.12	3.72	0.94	1.83	0.72	22.77	0.84	25.02	26.45	21.57	34.13
24	201.85	1.28	3.90	1.40	2.48	1.09	31.21	0.93	28.42	29.92	30.22	42.53
27	215.90	1.17	3.10	1.82	3.19	1.04	32.53	1.07	33.44	34.86	31.43	46.94
30	161.95	1.13	2.78	2.12	4.71	0.74	26.39	1.10	37.01	38.37	25.14	45.87
33	91.75	1.19	3.47	2.21	8.43	0.47	18.05	0.96	42.18	43.59	17.17	46.85
36	41.92	1.20	4.14	2.08	14.79	0.26	11.62	0.77	46.74	49.31	11.44	50.62
39	6.81	1.25	4.42	1.76	24.16	0.20	8.15	0.76	53.08	58.51	8.30	59.09
42	-14.09	1.43	4.47	1.33	35.93	0.32	7.01	0.99	62.84	72.56	6.93	72.89
45	-22.36	1.65	4.63	0.94	48.49	0.47	7.06	1.25	76.32	90.61	6.55	90.85
48	-22.39	1.82	5.01	0.69	60.03	0.61	7.35	1.37	90.22	108.56	6.63	108.76
52	-20.20	1.91	5.65	0.58	72.21	0.81	7.60	1.35	104.54	127.24	6.90	127.43

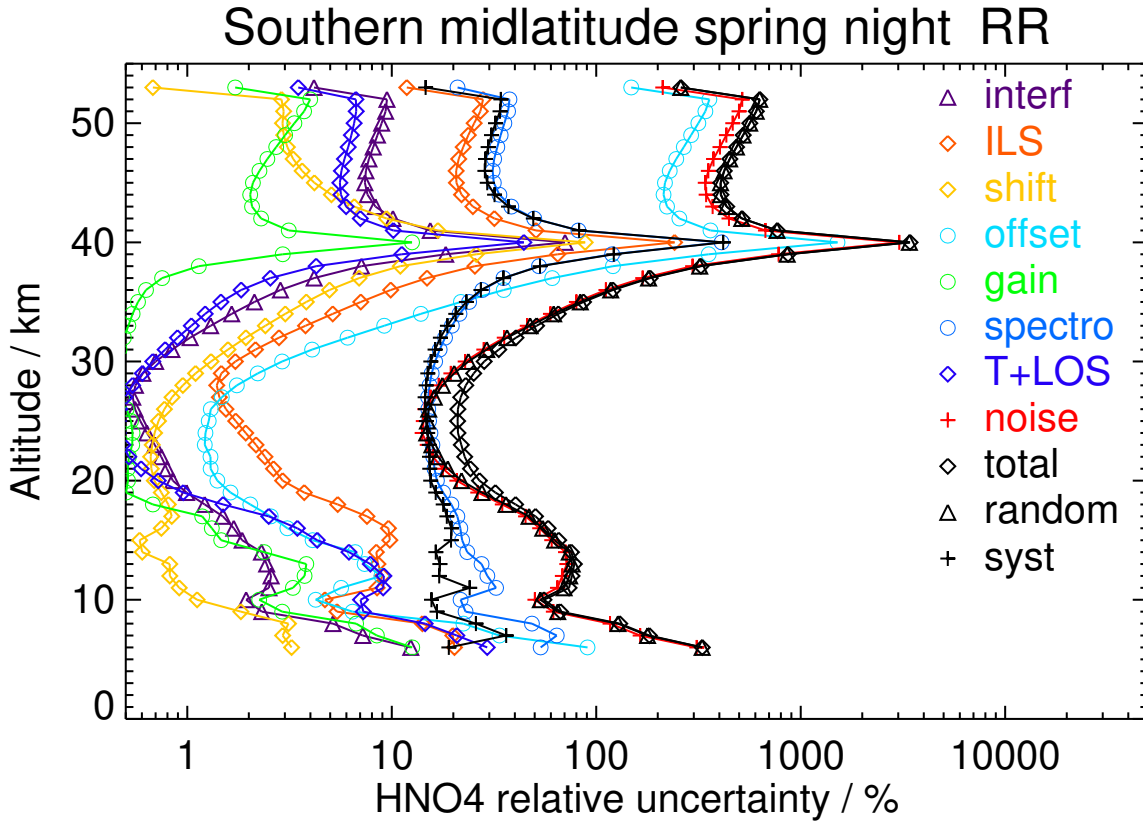


Figure S56: V8R_HNO₄_262 Southern midlatitude spring night

Table S61: HNO₄ 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)
6	-35.92	1.01	3.23	0.70	7.65	1.27	10.40	3.33	25.13	28.66	1.20	28.68
9	16.87	0.62	2.20	0.60	2.67	1.03	6.94	1.86	14.80	16.45	3.70	16.86
12	28.67	0.57	2.71	0.23	1.28	0.90	9.08	2.01	14.22	16.51	5.12	17.29
15	25.49	0.55	2.08	0.12	1.11	0.39	5.81	1.33	16.67	17.23	4.76	17.87
18	49.06	0.73	3.33	0.38	1.03	0.41	9.34	0.96	20.16	20.71	8.86	22.53
21	118.12	1.10	3.77	0.81	1.54	0.65	18.56	0.81	23.67	24.18	18.44	30.41
24	193.35	1.27	3.87	1.29	2.22	1.03	28.48	0.85	26.81	27.28	28.48	39.43
27	211.58	1.20	2.86	1.75	3.09	0.84	31.01	1.06	32.45	32.90	30.92	45.15
30	162.17	1.20	2.68	2.24	4.04	0.50	25.62	1.09	35.33	36.00	25.30	44.00
33	107.22	1.22	3.56	2.40	6.27	0.41	18.57	0.91	39.98	40.98	18.00	44.76
36	63.66	1.16	3.94	2.05	10.29	0.50	13.40	0.72	43.97	45.58	12.76	47.33
39	31.89	1.28	3.52	1.39	17.29	0.58	10.83	1.01	48.19	51.54	9.97	52.50
42	11.49	1.59	2.98	0.68	27.59	0.60	10.51	1.51	54.13	61.09	9.23	61.78
45	5.98	1.89	2.90	0.27	39.86	0.59	11.17	1.88	64.97	76.56	9.45	77.15
48	-0.11	2.10	3.35	0.42	52.31	0.48	11.63	2.04	79.20	95.24	9.61	95.73
52	-4.41	2.20	4.52	0.57	66.34	0.46	11.42	1.92	96.06	117.04	9.45	117.42

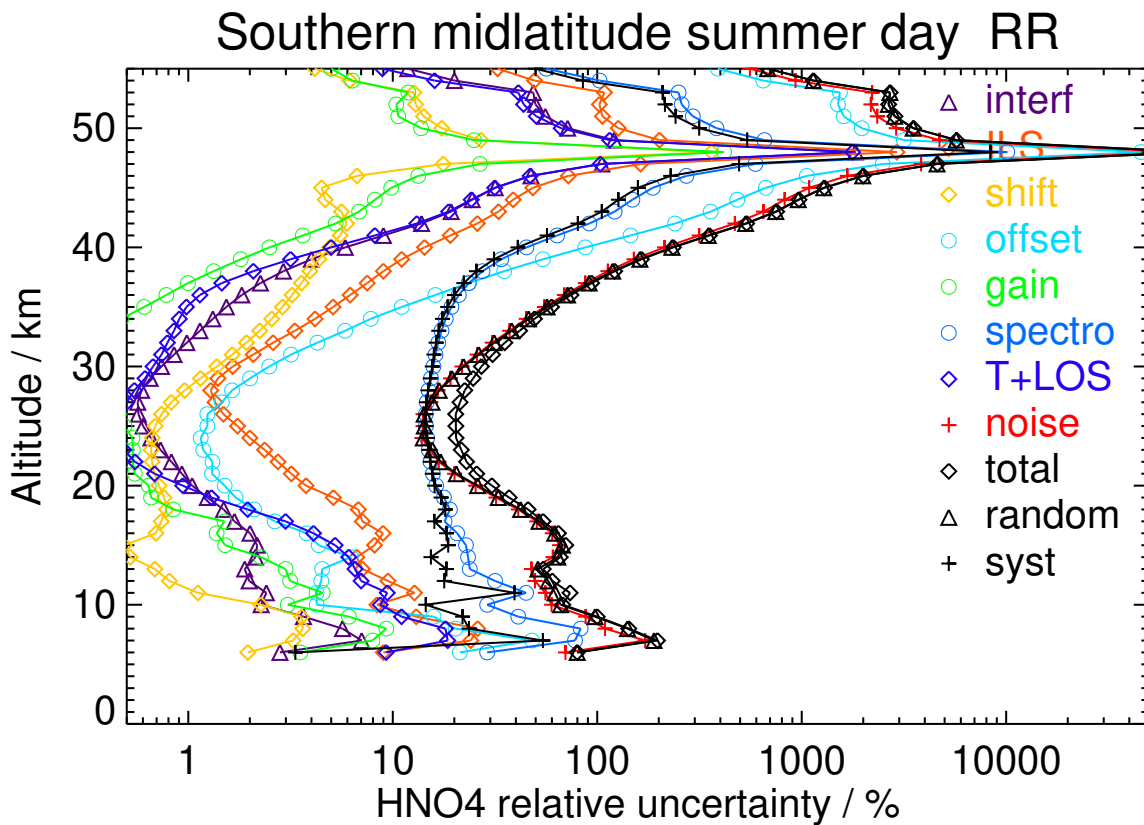


Figure S57: V8R_HNO₄_262 Southern midlatitude summer day

Table S62: HNO₄ 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)
6	-6.78	0.98	3.06	0.43	6.43	0.79	7.38	1.80	24.33	25.57	6.95	26.50
9	27.45	0.59	2.88	0.59	2.17	1.01	7.42	2.00	15.23	16.97	4.19	17.48
12	29.22	0.59	1.61	0.16	1.54	0.76	6.77	1.93	14.32	15.47	4.58	16.14
15	27.55	0.56	2.84	0.13	1.37	0.44	6.99	1.33	16.83	17.53	6.09	18.56
18	58.73	0.75	2.86	0.42	1.08	0.41	9.95	0.92	20.10	20.52	9.65	22.67
21	126.31	1.11	3.77	0.82	1.51	0.57	20.21	0.81	23.59	24.10	20.09	31.38
24	206.61	1.27	4.03	1.31	2.27	1.13	30.57	0.89	26.60	27.24	30.44	40.85
27	214.51	1.20	2.72	1.78	2.99	0.99	32.32	1.11	32.08	32.79	31.96	45.79
30	167.63	1.21	2.52	2.27	4.02	0.58	26.56	1.10	35.08	35.87	26.07	44.35
33	114.80	1.23	3.50	2.45	6.02	0.42	19.30	0.91	39.69	40.54	19.01	44.77
36	81.22	1.16	4.18	2.08	9.69	0.45	14.20	0.72	43.53	44.91	14.06	47.06
39	50.76	1.28	4.07	1.38	16.15	0.45	11.61	0.96	47.49	50.48	11.11	51.69
42	27.45	1.60	3.75	0.64	25.97	0.42	10.87	1.40	52.81	59.20	9.81	60.01
45	13.78	1.90	3.89	0.26	38.02	0.40	10.94	1.70	62.92	73.86	9.50	74.47
48	8.44	2.09	4.52	0.39	50.59	0.43	10.99	1.79	76.96	92.42	9.48	92.91
52	5.81	2.15	5.81	0.52	65.19	0.69	10.61	1.63	94.44	115.03	9.55	115.43

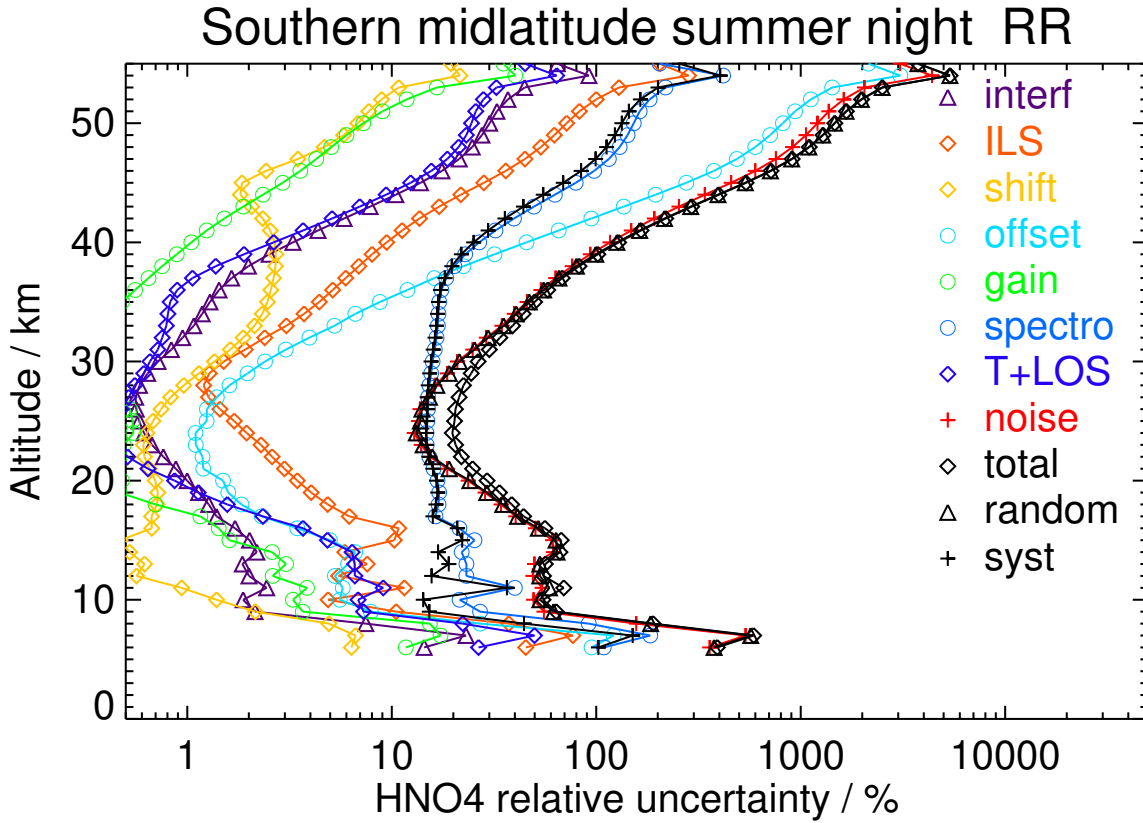


Figure S58: V8R_HNO₄_262 Southern midlatitude summer night

Table S63: HNO₄ 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)
6	3.15	0.89	1.93	0.23	6.68	0.86	5.85	1.90	23.02	24.51	4.15	24.85
9	6.32	0.53	0.99	0.48	1.55	0.59	3.61	1.54	14.58	15.11	1.98	15.24
12	18.95	0.57	1.67	0.19	1.37	0.81	6.15	1.80	15.12	16.35	2.83	16.59
15	14.88	0.56	2.26	0.18	1.17	0.36	4.33	1.14	18.18	18.48	4.00	18.91
18	38.63	0.75	2.53	0.47	1.12	0.25	7.09	0.76	21.90	22.14	6.99	23.21
21	80.95	1.12	2.79	0.80	1.81	0.29	13.11	0.64	25.64	26.04	12.85	29.03
24	125.98	1.28	3.04	1.13	2.72	0.41	19.15	0.69	30.57	31.35	18.40	36.35
27	131.25	1.19	2.78	1.39	4.05	0.56	20.68	0.81	36.18	37.25	19.43	42.02
30	101.90	1.14	2.90	1.62	7.08	0.46	17.78	0.81	40.53	41.86	16.44	44.97
33	67.24	1.17	3.47	1.80	13.18	0.33	13.87	0.70	45.48	47.82	12.86	49.52
36	39.89	1.21	4.07	1.89	22.44	0.26	11.14	0.59	51.53	56.53	10.47	57.49
39	23.55	1.27	4.49	1.85	34.19	0.30	9.98	0.60	61.37	70.52	9.31	71.14
42	19.19	1.38	4.78	1.71	47.15	0.43	9.85	0.73	74.61	88.52	8.87	88.97
45	16.20	1.50	5.02	1.54	59.63	0.56	10.06	0.89	88.94	107.34	8.77	107.69
48	10.73	1.60	5.30	1.40	70.21	0.69	10.21	0.97	101.25	123.46	8.77	123.77

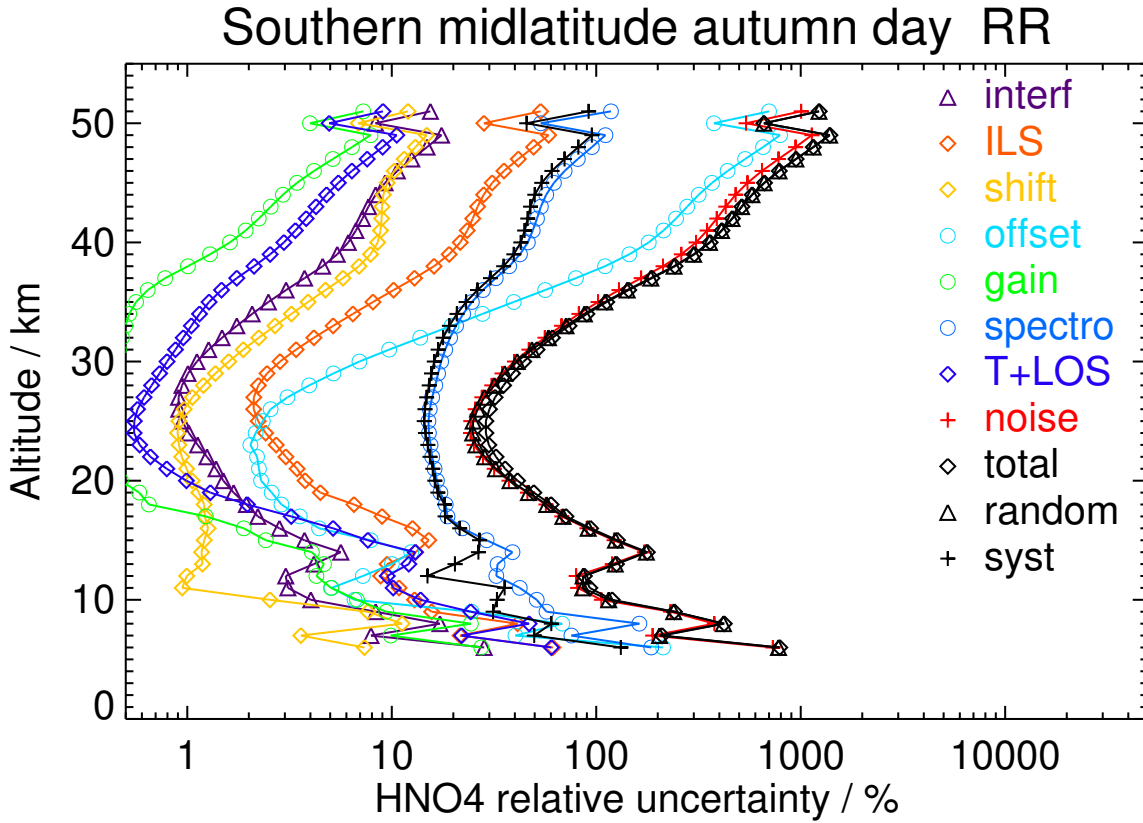


Figure S59: V8R_HNO₄_262 Southern midlatitude autumn day

Table S64: HNO₄ 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)
6	-11.33	0.96	1.63	0.22	6.78	0.47	3.91	1.60	23.96	25.14	3.18	25.34
9	13.41	0.58	1.20	0.53	1.80	0.80	4.93	1.69	14.97	15.73	3.13	16.04
12	19.72	0.59	2.16	0.18	1.64	0.86	7.01	1.93	14.92	16.34	4.12	16.85
15	21.27	0.57	2.10	0.17	1.14	0.52	5.30	1.29	17.76	18.33	3.91	18.75
18	34.94	0.76	2.62	0.46	1.12	0.38	7.29	0.84	21.34	21.74	6.75	22.76
21	95.35	1.11	2.90	0.79	1.75	0.32	15.05	0.66	25.21	25.79	14.52	29.60
24	140.27	1.28	2.97	1.12	2.60	0.65	21.15	0.73	29.31	30.18	20.37	36.41
27	133.16	1.19	2.71	1.38	3.87	0.65	21.33	0.84	35.91	36.75	20.50	42.08
30	108.29	1.14	3.10	1.66	6.47	0.47	18.06	0.79	39.64	40.62	17.43	44.21
33	83.54	1.18	3.83	1.87	11.76	0.35	15.05	0.69	44.59	46.52	14.46	48.71
36	63.96	1.21	4.43	1.94	20.26	0.31	13.60	0.59	49.57	54.00	12.72	55.48
39	55.45	1.27	4.77	1.83	31.50	0.32	13.51	0.66	58.45	66.89	11.99	67.96
42	52.45	1.41	4.94	1.61	44.37	0.36	14.10	0.88	71.08	84.31	11.85	85.14
45	53.23	1.57	5.12	1.37	57.04	0.44	14.75	1.08	85.47	103.28	11.95	103.97
48	53.70	1.67	5.41	1.22	67.96	0.56	15.17	1.14	98.35	120.04	12.10	120.65
52	-2.53	1.82	5.72	0.91	75.89	0.72	6.69	1.20	107.33	131.55	7.47	131.77

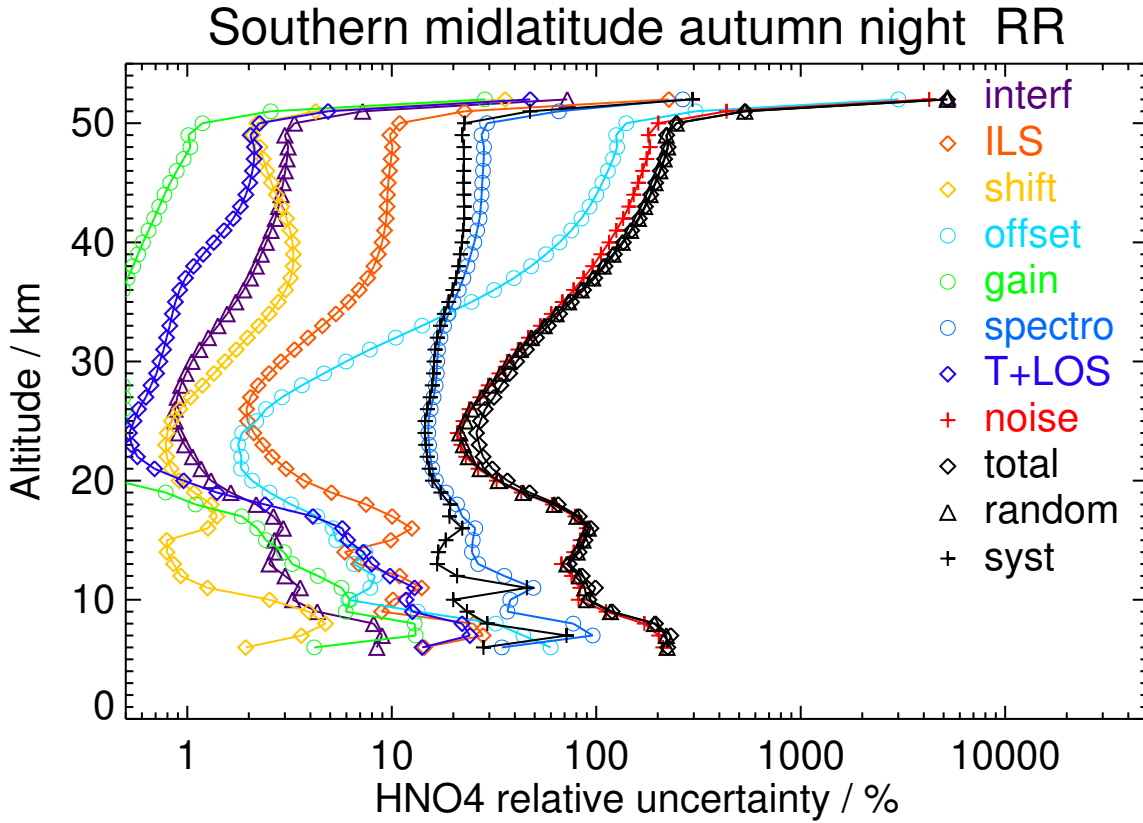


Figure S60: V8R_HNO₄_262 Southern midlatitude autumn night

Table S65: HNO₄ 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)
6	11.35	0.73	2.60	0.32	4.47	1.05	8.59	2.32	16.30	18.31	6.19	19.32
9	9.76	0.54	1.17	0.18	1.38	0.57	4.77	1.64	14.10	14.90	2.51	15.11
12	5.07	0.54	1.09	0.16	1.06	0.47	4.06	1.54	16.48	17.04	1.69	17.12
15	10.24	0.56	1.73	0.33	1.26	0.34	3.41	1.23	20.74	21.01	2.67	21.18
18	4.98	0.96	1.62	0.51	2.03	0.19	4.40	0.69	26.32	26.69	2.90	26.85
21	21.52	1.45	1.73	0.68	3.47	0.32	6.45	0.60	32.33	32.91	4.70	33.24
24	36.33	1.52	1.87	0.86	5.66	0.28	8.07	0.59	39.42	40.19	6.59	40.72
27	47.33	1.48	2.38	1.14	9.08	0.21	9.15	0.55	44.67	45.95	7.69	46.59
30	45.66	1.49	3.13	1.44	14.53	0.24	9.92	0.54	49.02	51.56	8.28	52.22
33	37.23	1.49	3.88	1.62	22.54	0.29	10.41	0.61	52.84	57.92	8.60	58.56
36	28.59	1.47	4.47	1.59	32.87	0.33	10.77	0.82	58.71	67.76	8.84	68.33
39	17.97	1.52	4.93	1.35	44.90	0.36	11.08	1.16	68.50	82.34	9.01	82.83
42	2.30	1.67	5.35	1.01	57.58	0.40	11.33	1.55	81.18	99.93	9.16	100.35
45	-12.13	1.88	5.73	0.70	69.59	0.46	11.53	1.90	94.57	117.78	9.33	118.15
48	11.68	2.08	6.12	0.50	79.48	0.47	12.63	2.15	105.90	132.77	10.50	133.18
52	-114.18	2.53	6.36	0.49	88.74	0.45	4.80	2.67	115.80	145.98	7.18	146.16

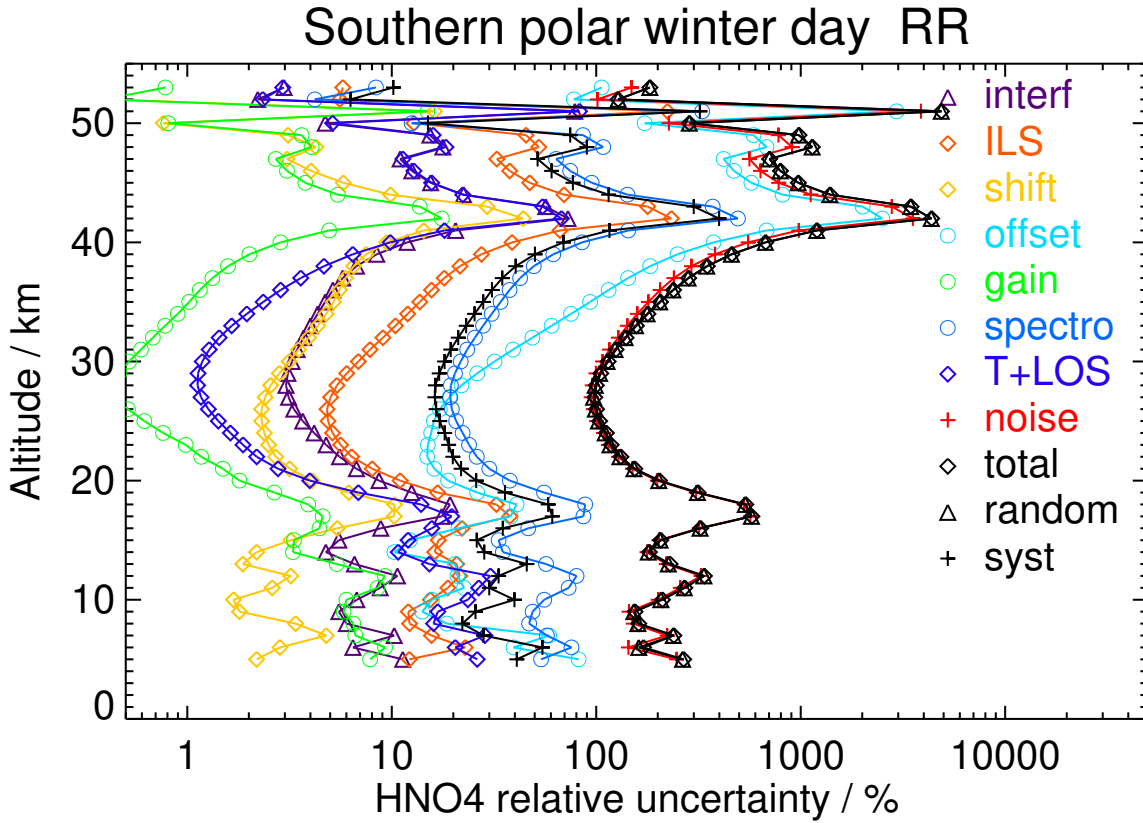


Figure S61: V8R_HNO₄_262 Southern polar winter day

Table S66: HNO₄ 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)
6	6.70	0.74	2.20	0.35	3.23	0.82	7.99	2.41	14.15	15.48	6.84	16.92
9	13.95	0.54	1.08	0.15	0.99	0.71	4.99	1.62	13.70	14.22	4.01	14.77
12	8.46	0.56	0.92	0.18	1.20	0.54	4.18	1.81	16.28	16.73	2.99	16.99
15	7.07	0.57	1.74	0.31	1.33	0.32	3.36	1.20	20.78	21.03	2.79	21.21
18	15.65	0.93	1.81	0.53	1.99	0.23	4.43	0.78	26.21	26.50	3.62	26.75
21	26.58	1.41	1.74	0.70	3.42	0.26	6.78	0.57	32.04	32.62	5.05	33.01
24	41.36	1.50	1.82	0.89	5.66	0.32	8.19	0.58	39.06	39.88	6.44	40.39
27	37.24	1.47	2.28	1.16	9.29	0.33	7.75	0.60	44.52	45.75	6.65	46.23
30	21.58	1.49	3.17	1.45	14.79	0.30	6.84	0.56	48.88	51.28	6.36	51.67
33	6.76	1.50	4.04	1.60	22.66	0.27	6.63	0.53	52.91	57.76	6.43	58.12
36	-3.19	1.47	4.69	1.54	32.82	0.28	7.17	0.67	58.71	67.49	6.88	67.84
39	-7.85	1.50	5.18	1.31	44.69	0.30	8.15	1.02	68.20	81.80	7.48	82.14
42	-5.49	1.63	5.64	1.02	57.32	0.37	9.15	1.43	80.67	99.24	8.13	99.57
45	-13.48	1.80	6.10	0.77	68.91	0.45	8.53	1.78	93.66	116.49	8.21	116.78
48	-12.45	1.97	6.53	0.57	78.80	0.53	10.45	2.03	105.09	131.65	9.09	131.96
52	28.90	2.10	6.88	0.45	88.54	0.72	7.42	2.12	116.85	146.75	8.25	146.99

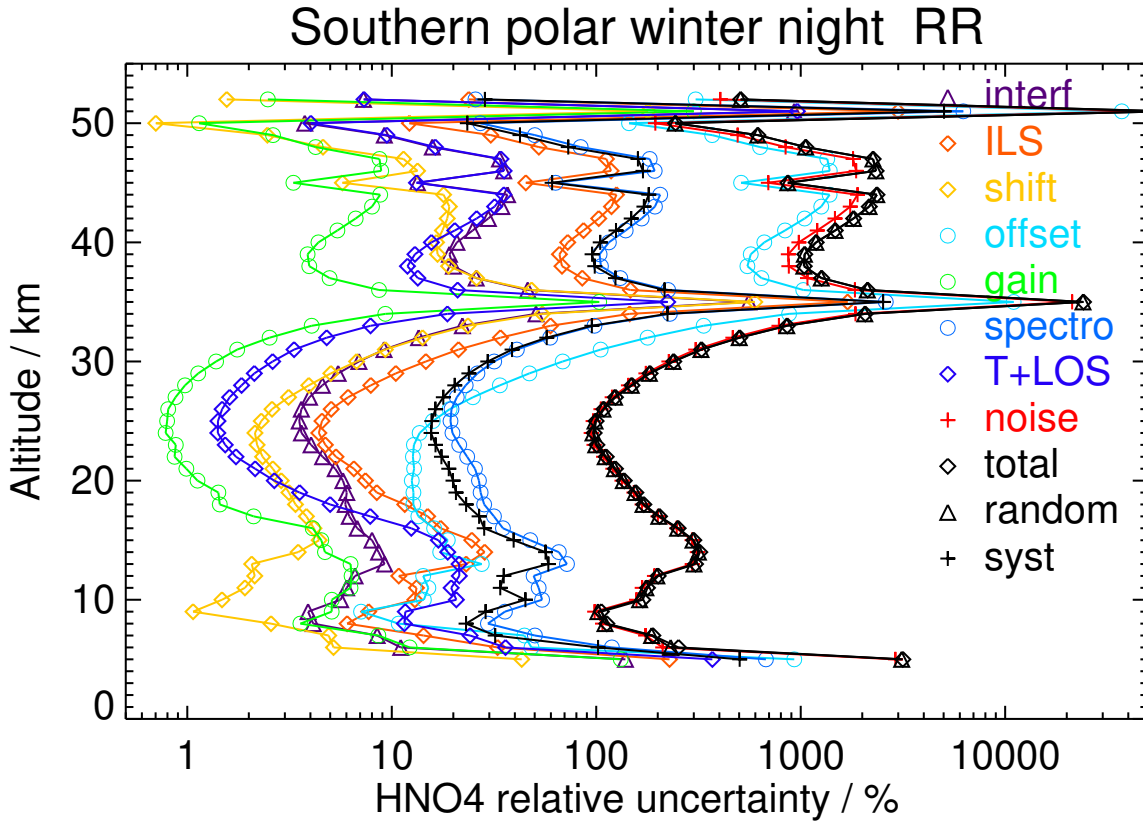


Figure S62: V8R_HNO₄_262 Southern polar winter night

Table S67: HNO4 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)
6	2.76	0.68	2.28	0.27	2.88	0.37	5.61	1.97	14.59	15.48	4.76	16.20
9	15.43	0.57	2.22	0.18	0.75	0.58	6.98	1.80	13.94	14.64	6.17	15.89
12	28.22	0.60	2.00	0.13	0.92	0.53	6.07	1.82	16.60	17.28	4.75	17.92
15	28.24	0.72	3.36	0.25	1.00	0.51	7.30	1.33	19.61	20.48	5.77	21.28
18	73.11	0.94	3.64	0.63	1.33	0.61	13.62	0.98	22.89	24.34	11.62	26.97
21	116.16	1.12	3.59	1.06	2.05	0.87	20.83	0.86	25.83	28.02	18.35	33.50
24	155.22	1.27	4.17	1.56	2.77	1.10	24.78	0.91	30.28	32.40	22.63	39.52
27	144.89	1.16	3.82	2.00	3.04	0.83	23.67	0.92	32.66	34.46	21.70	40.72
30	104.23	0.96	3.68	2.05	3.95	0.47	18.71	0.81	36.15	37.49	16.94	41.14
33	68.83	0.96	3.99	1.85	6.98	0.33	13.22	0.86	40.10	41.24	12.29	43.04
36	38.68	1.05	4.24	1.70	12.62	0.30	9.18	0.88	45.26	47.22	9.21	48.11
39	13.18	1.15	4.43	1.47	21.27	0.34	7.33	0.89	51.25	55.66	7.65	56.19
42	-3.70	1.30	4.61	1.17	32.67	0.45	7.14	1.00	60.51	68.96	7.08	69.32
45	-8.59	1.47	4.91	0.86	45.12	0.60	7.58	1.15	74.07	86.94	7.06	87.22
48	-7.71	1.60	5.44	0.66	56.72	0.76	7.98	1.22	88.25	105.12	7.34	105.38
52	0.37	1.66	6.43	0.65	68.99	1.02	8.34	1.16	103.12	124.28	8.07	124.54

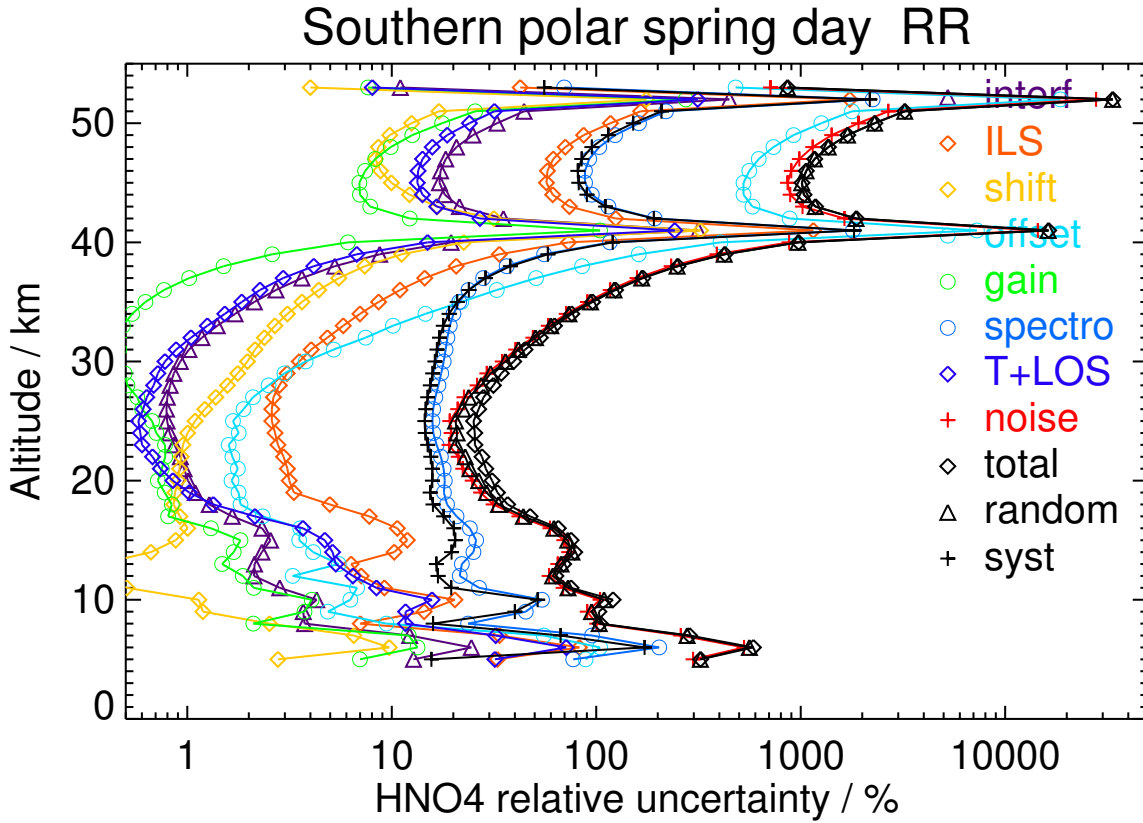


Figure S63: V8R_HNO4_262 Southern polar spring day

Table S68: HNO4 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)
6	4.01	0.65	1.86	0.25	1.73	0.45	4.92	1.99	12.65	13.43	3.86	13.98
9	23.04	0.59	1.91	0.14	0.79	0.73	7.88	2.02	13.08	13.95	6.91	15.57
12	24.33	0.56	1.87	0.12	0.87	0.71	6.09	1.81	15.47	16.26	4.50	16.87
15	45.83	0.69	4.02	0.31	0.87	0.44	9.20	1.31	18.32	19.28	8.25	20.97
18	92.37	0.90	4.00	0.70	1.28	0.60	15.79	1.06	21.43	22.83	14.41	27.00
21	136.52	1.09	3.85	1.13	1.97	0.88	23.01	0.91	24.50	26.20	21.58	33.94
24	184.86	1.22	4.50	1.57	2.72	1.12	28.78	0.95	29.70	31.54	27.38	41.77
27	183.54	1.12	3.73	1.96	3.01	0.93	28.93	0.99	32.16	33.98	27.33	43.60
30	139.99	1.01	3.23	2.17	4.06	0.58	23.24	0.96	36.10	37.46	21.77	43.33
33	87.41	0.98	3.63	2.09	6.99	0.35	16.17	0.89	40.22	41.39	15.31	44.13
36	38.84	1.03	4.15	1.87	12.85	0.20	11.21	0.83	45.48	47.56	10.94	48.80
39	21.19	1.16	4.54	1.58	21.68	0.23	9.66	0.85	51.41	56.09	9.22	56.84
42	22.47	1.33	4.83	1.26	33.22	0.39	10.34	0.97	60.90	69.74	9.10	70.34
45	27.51	1.51	5.18	0.97	45.66	0.57	11.61	1.11	74.62	87.90	9.61	88.43
48	35.01	1.63	5.67	0.79	57.13	0.77	12.63	1.17	88.75	105.99	10.24	106.48
52	48.38	1.72	6.53	0.57	68.85	0.98	13.94	1.20	102.69	124.08	11.48	124.61

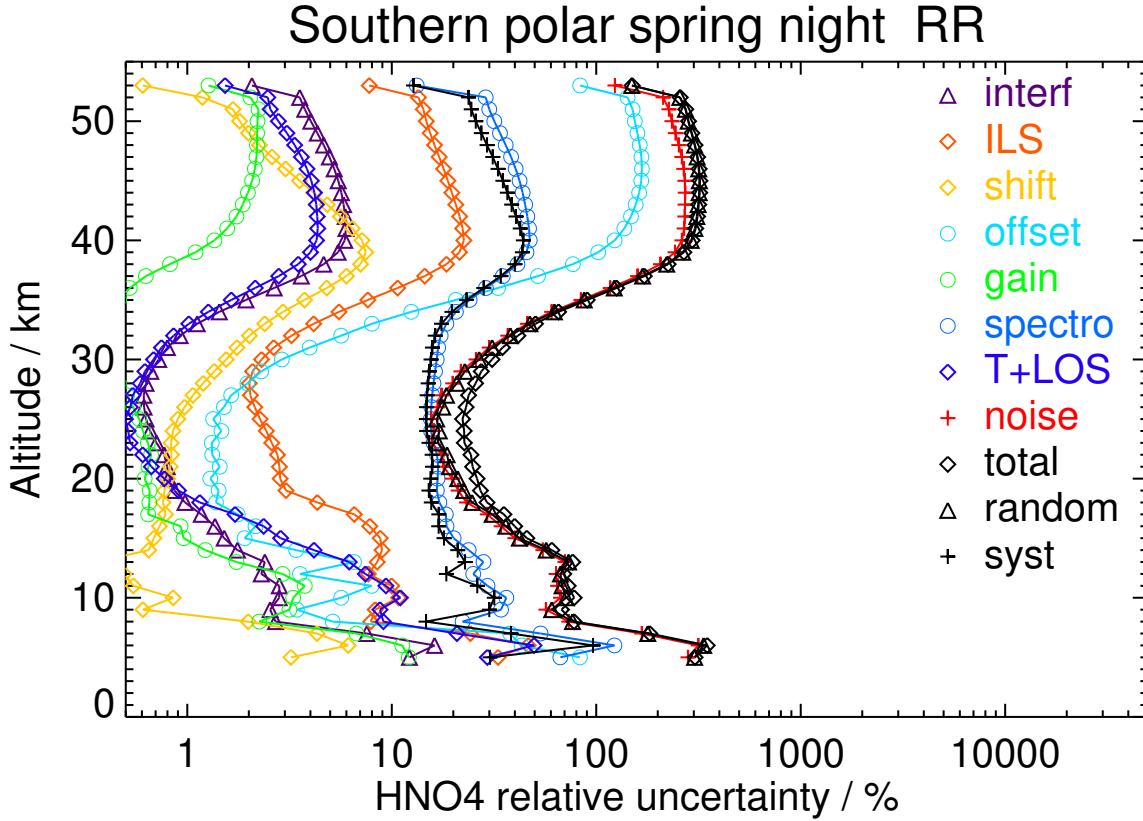


Figure S64: V8R_HNO4_262 Southern polar spring night

Table S69: HNO₄ 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)
6	-1.17	0.74	3.34	0.25	2.79	1.14	10.38	2.06	14.93	16.53	9.10	18.87
9	24.29	0.54	2.02	0.41	0.79	0.85	7.12	1.93	12.59	14.31	3.77	14.79
12	28.09	0.58	2.86	0.22	0.96	1.10	7.95	2.08	13.13	14.11	7.18	15.83
15	41.90	0.71	3.69	0.21	0.91	0.40	7.48	1.18	15.78	16.25	7.59	17.93
18	78.54	0.89	2.62	0.55	0.90	0.44	12.81	0.83	18.55	18.93	12.64	22.76
21	129.10	1.05	3.47	0.97	1.65	0.83	19.19	0.80	21.34	21.71	19.25	29.01
24	127.53	1.20	3.37	1.15	2.47	0.98	20.48	0.89	27.66	28.30	20.13	34.73
27	110.98	1.14	2.77	1.38	2.58	0.56	17.92	0.81	30.27	30.99	17.19	35.44
30	84.27	1.08	2.96	1.78	3.68	0.20	13.66	0.76	34.87	35.52	12.98	37.81
33	52.20	0.96	3.61	1.95	5.78	0.22	9.89	0.65	39.18	39.93	9.48	41.05
36	27.44	0.90	3.83	1.73	9.67	0.32	7.80	0.53	44.34	45.63	7.55	46.25
39	15.96	1.12	3.46	1.11	16.09	0.41	7.70	0.86	48.32	51.18	7.03	51.66
42	10.81	1.57	2.95	0.32	25.72	0.45	8.95	1.44	53.31	59.46	7.84	59.97
45	11.25	2.02	2.82	0.49	37.41	0.46	10.37	1.92	62.82	73.40	9.08	73.96
48	7.45	2.36	3.25	1.07	49.65	0.43	11.13	2.18	76.21	91.23	9.87	91.76
52	0.17	2.56	4.56	1.45	64.21	0.66	10.81	2.14	93.82	113.92	9.96	114.35
56	47.48	2.31	7.43	1.21	69.98	1.36	11.82	1.63	103.50	125.09	12.95	125.76

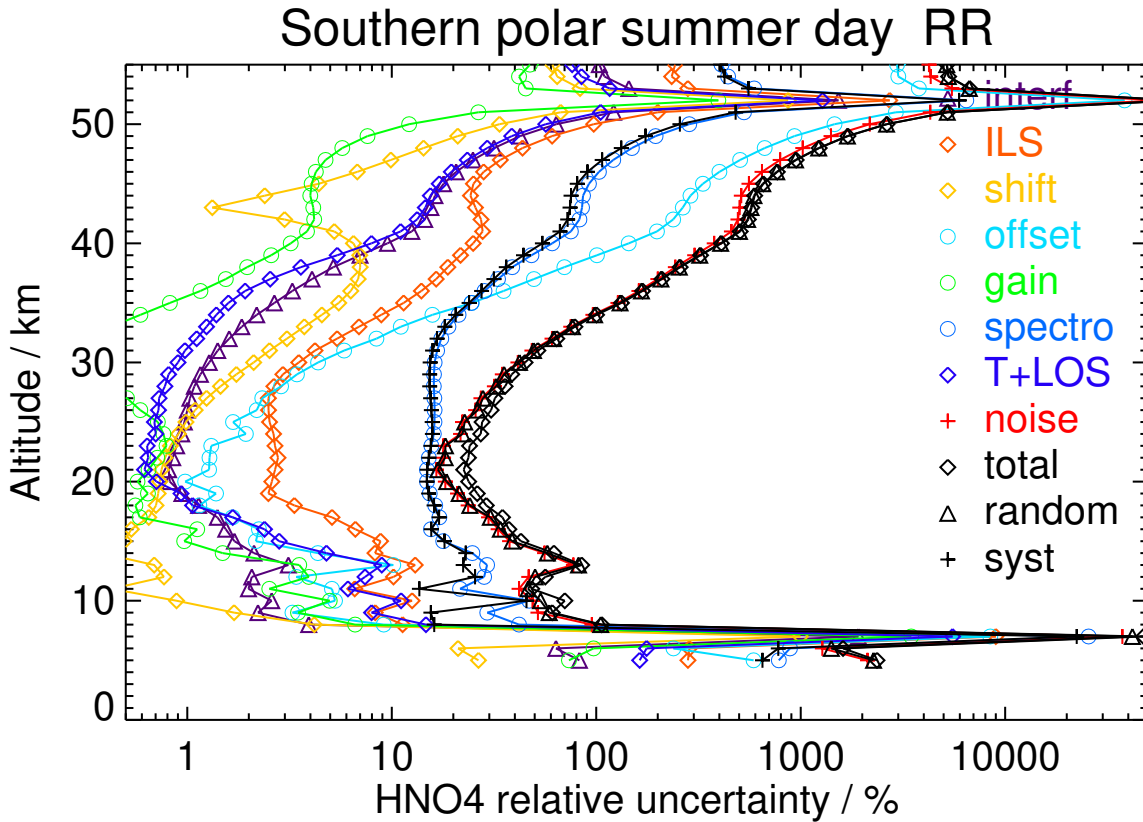


Figure S65: V8R.HNO₄.262 Southern polar summer day

Table S70: HNO₄ 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)
6	0.39	0.87	3.03	0.29	4.03	1.01	9.64	1.81	17.62	18.55	9.47	20.83
9	29.28	0.60	2.22	0.59	1.45	0.71	6.96	2.42	14.59	15.78	5.15	16.60
12	36.89	0.70	1.90	0.22	1.66	1.10	7.74	2.60	14.33	15.27	6.87	16.74
15	38.81	0.67	3.72	0.21	1.51	0.45	8.10	1.32	16.83	17.33	8.19	19.17
18	82.04	0.85	3.06	0.53	1.16	0.35	13.53	0.93	19.51	19.87	13.47	24.01
21	137.18	1.07	3.12	0.93	1.66	0.92	20.86	0.86	22.44	22.88	20.76	30.90
24	147.63	1.23	3.32	1.19	2.46	0.98	23.00	0.92	27.84	28.54	22.61	36.41
27	127.23	1.16	2.69	1.45	2.86	0.59	20.46	0.87	31.28	32.04	19.76	37.65
30	95.98	1.10	3.17	1.85	4.00	0.24	15.73	0.78	35.61	36.28	15.18	39.33
33	69.24	1.02	3.92	2.04	6.47	0.26	11.81	0.64	39.89	40.74	11.55	42.35
36	45.54	0.96	4.32	1.86	10.93	0.36	9.41	0.55	44.56	46.15	9.35	47.09
39	26.28	1.14	4.06	1.31	18.25	0.42	8.93	0.85	49.02	52.60	8.34	53.25
42	19.06	1.54	3.58	0.58	28.77	0.44	9.86	1.39	55.27	62.64	8.55	63.22
45	20.44	1.94	3.47	0.27	41.12	0.42	11.07	1.82	66.27	78.34	9.35	78.89
48	21.83	2.19	3.91	0.62	53.55	0.37	11.75	1.99	80.22	96.79	9.88	97.29
52	24.24	2.31	5.07	0.83	67.72	0.63	11.65	1.87	97.03	118.62	9.97	119.04

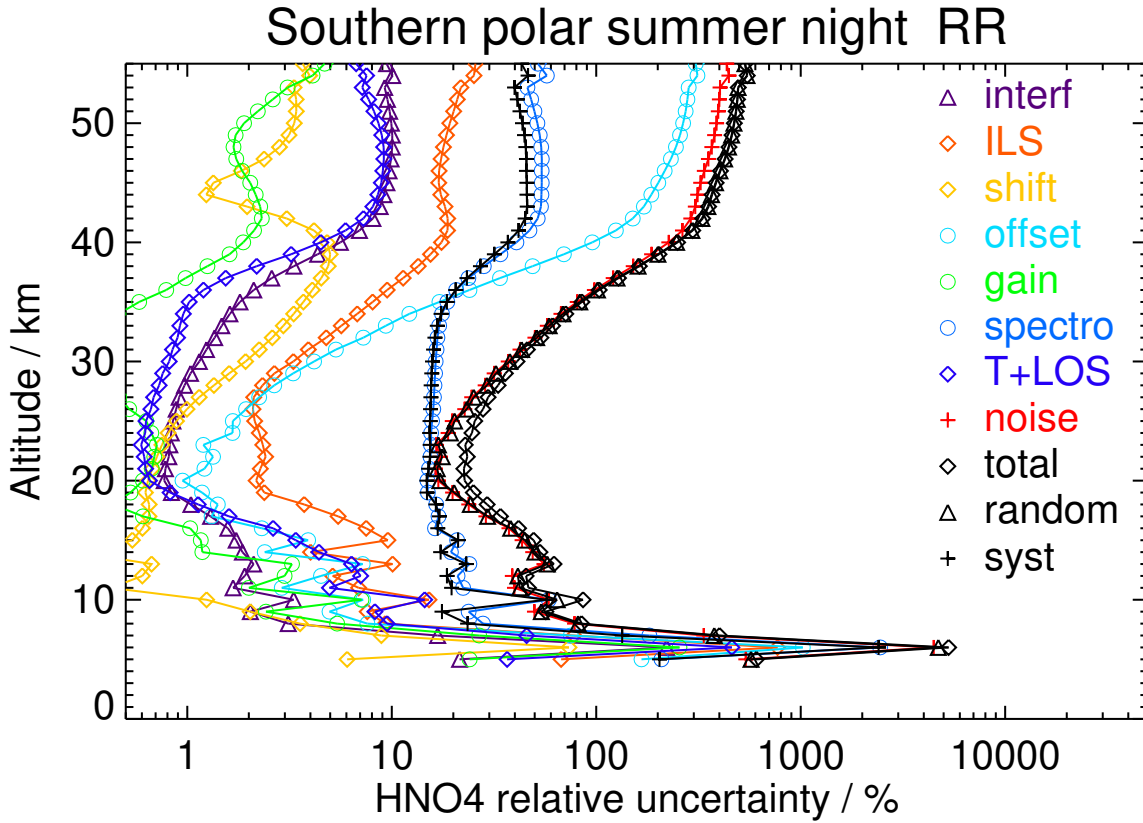


Figure S66: V8R_HNO₄.262 Southern polar summer night

Table S71: HNO₄ 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)
6	0.57	0.63	1.70	0.28	2.80	0.82	5.61	1.70	13.62	14.44	4.81	15.22
9	7.72	0.51	1.17	0.25	0.73	0.72	5.09	1.45	12.40	13.07	3.67	13.58
12	17.31	0.52	1.13	0.19	0.83	0.61	4.45	1.50	14.02	14.57	3.02	14.88
15	13.66	0.50	2.07	0.28	0.85	0.43	3.79	1.05	17.41	17.67	3.41	18.00
18	32.77	0.94	2.20	0.58	1.25	0.25	5.98	0.65	21.57	21.83	5.71	22.56
21	57.11	1.51	2.25	0.80	2.11	0.26	9.34	0.57	26.15	26.58	8.77	27.99
24	65.88	1.42	2.19	0.91	3.36	0.29	11.17	0.62	33.35	33.93	10.24	35.44
27	61.55	1.34	2.22	1.02	5.87	0.25	11.69	0.60	38.61	39.50	10.48	40.87
30	57.08	1.40	2.67	1.17	11.49	0.24	11.89	0.58	44.32	46.17	10.79	47.42
33	59.74	1.46	3.25	1.32	20.69	0.23	12.75	0.55	50.33	54.80	11.65	56.02
36	73.35	1.47	3.78	1.42	32.57	0.25	14.27	0.59	59.07	67.89	12.77	69.08
39	84.58	1.47	4.25	1.41	45.81	0.30	15.88	0.73	71.16	85.13	13.81	86.24
42	90.63	1.53	4.65	1.30	59.09	0.36	17.19	0.94	85.07	104.10	14.63	105.12
45	95.08	1.63	4.95	1.13	71.17	0.42	18.11	1.16	98.69	122.20	15.19	123.14
48	84.74	1.74	5.16	0.99	80.56	0.48	18.10	1.31	109.40	136.33	15.22	137.18

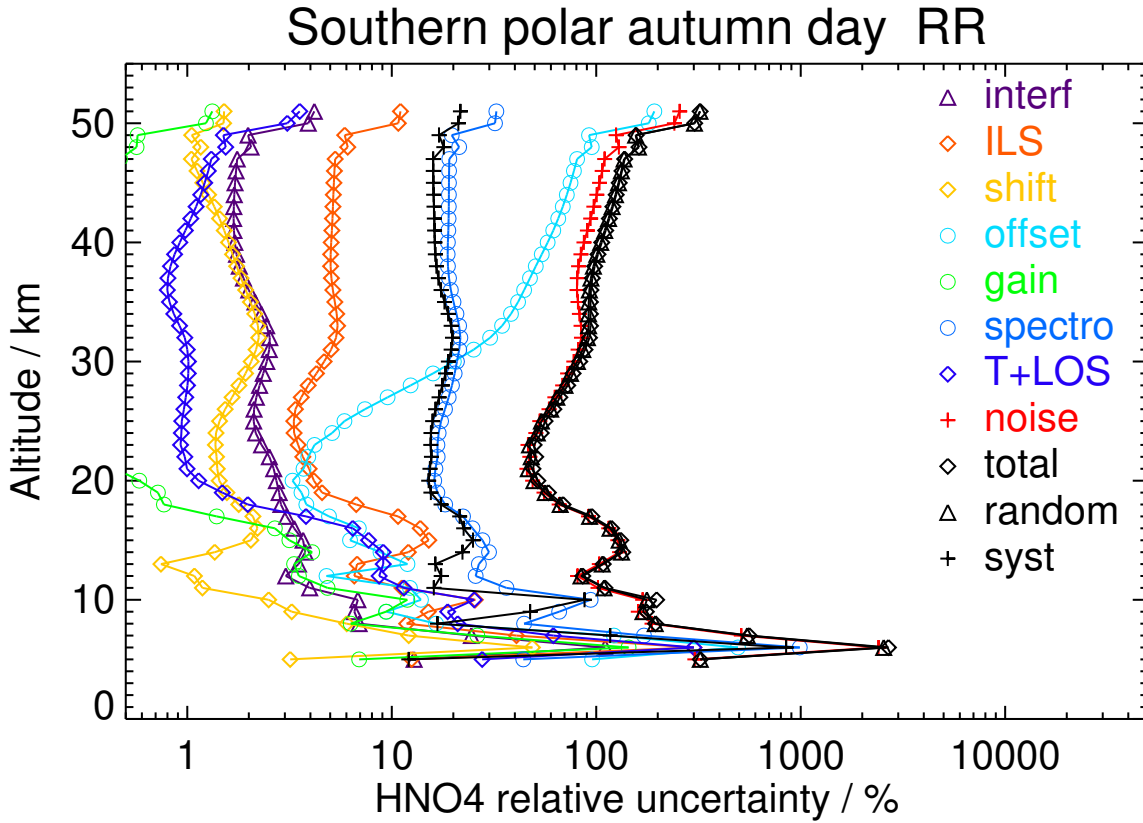


Figure S67: V8R_HNO₄_262 Southern polar autumn day

Table S72: HNO₄ 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)
6	-0.46	0.63	1.55	0.33	2.08	0.72	5.65	1.94	12.92	13.54	5.18	14.50
9	9.56	0.56	1.67	0.26	0.97	1.05	7.53	1.83	12.82	13.48	6.92	15.15
12	12.97	0.55	1.10	0.18	1.00	0.70	4.34	1.64	14.77	15.23	3.31	15.58
15	12.20	0.52	2.16	0.30	0.93	0.36	3.74	1.08	18.34	18.59	3.45	18.91
18	25.40	0.94	2.15	0.62	1.34	0.32	4.93	0.74	22.71	22.99	4.46	23.42
21	34.62	1.47	2.09	0.77	2.19	0.21	7.18	0.55	27.30	27.77	6.14	28.44
24	55.27	1.43	2.01	0.82	3.56	0.26	9.59	0.54	34.26	34.87	8.34	35.85
27	60.75	1.35	2.01	0.92	6.48	0.24	10.59	0.58	39.73	40.62	9.48	41.71
30	49.91	1.38	2.43	1.07	12.50	0.20	10.86	0.58	45.46	47.51	9.63	48.48
33	41.83	1.43	3.06	1.21	21.97	0.20	11.34	0.54	51.49	56.40	9.71	57.23
36	39.19	1.43	3.69	1.30	33.97	0.26	12.23	0.57	60.08	69.49	10.07	70.22
39	42.55	1.45	4.27	1.29	47.21	0.35	13.33	0.71	72.11	86.69	10.63	87.34
42	47.53	1.51	4.76	1.19	60.46	0.44	14.35	0.91	85.92	105.57	11.22	106.17
45	50.95	1.61	5.15	1.04	72.52	0.52	15.14	1.12	99.30	123.46	11.71	124.02
48	25.86	1.72	5.49	0.88	81.24	0.61	13.10	1.27	109.30	136.55	10.40	136.95

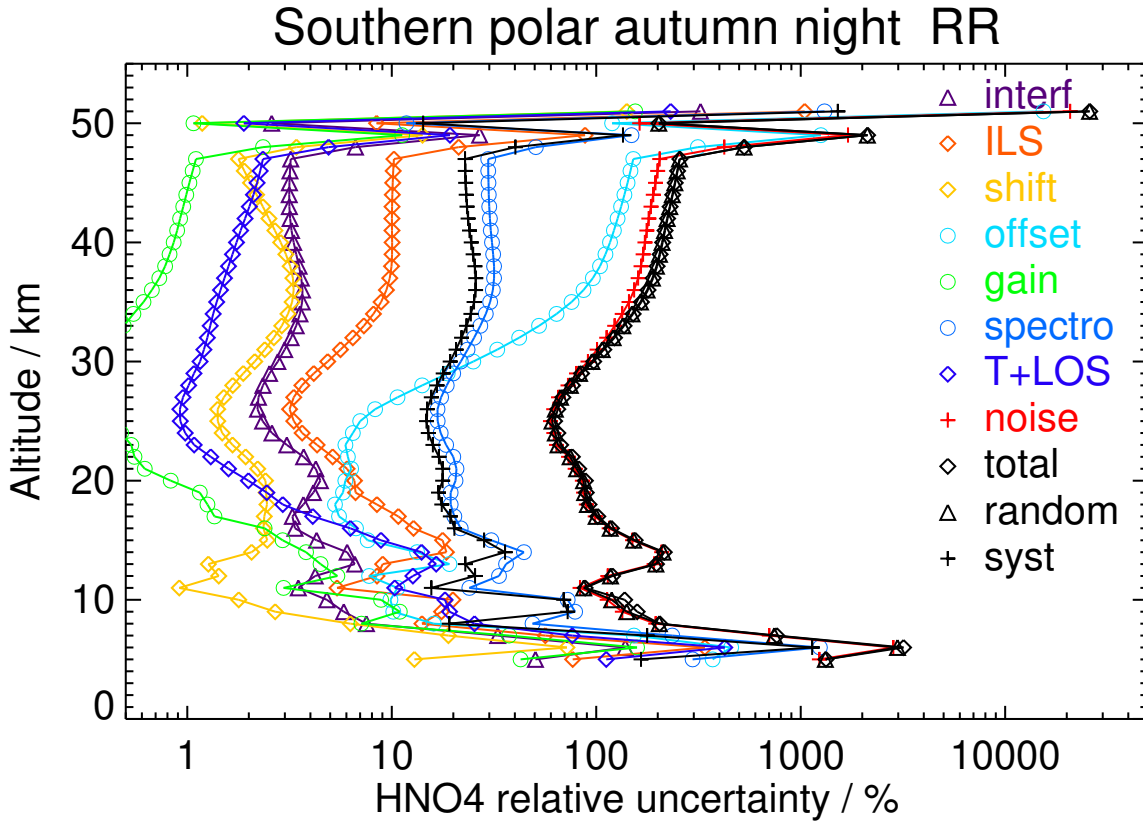


Figure S68: V8R_HNO₄.262 Southern polar autumn night

Table S73: HNO₄ 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)
15	45.68	1.61	2.82	0.51	9.95	0.87	8.55	0.85	26.63	28.94	7.47	29.89
18	40.07	1.74	3.17	0.73	7.30	0.57	8.08	0.83	24.65	26.24	7.22	27.22
21	61.40	1.83	3.66	1.13	3.22	0.38	10.85	0.63	23.25	24.11	10.29	26.22
24	99.81	1.47	4.16	1.42	2.75	0.48	15.45	0.63	29.52	30.32	14.84	33.76
27	108.66	1.20	4.14	1.55	4.34	0.58	16.88	0.69	35.38	36.20	16.32	39.71
30	95.28	1.24	4.07	1.61	9.39	0.51	15.93	0.70	41.53	43.05	15.33	45.70
33	73.13	1.32	4.06	1.64	19.13	0.39	14.62	0.63	49.00	53.02	13.81	54.79
36	55.56	1.31	4.12	1.67	32.82	0.29	14.18	0.57	60.07	68.88	12.82	70.06
39	47.09	1.24	4.22	1.69	48.34	0.31	14.40	0.55	74.25	89.03	12.38	89.88
42	43.24	1.18	4.33	1.70	63.45	0.39	14.75	0.57	88.65	109.44	12.22	110.12
45	38.81	1.15	4.52	1.74	75.43	0.49	15.23	0.61	100.00	125.71	12.01	126.28
48	-18.92	1.10	4.80	1.79	84.50	0.57	13.88	0.68	108.30	137.81	9.91	138.17

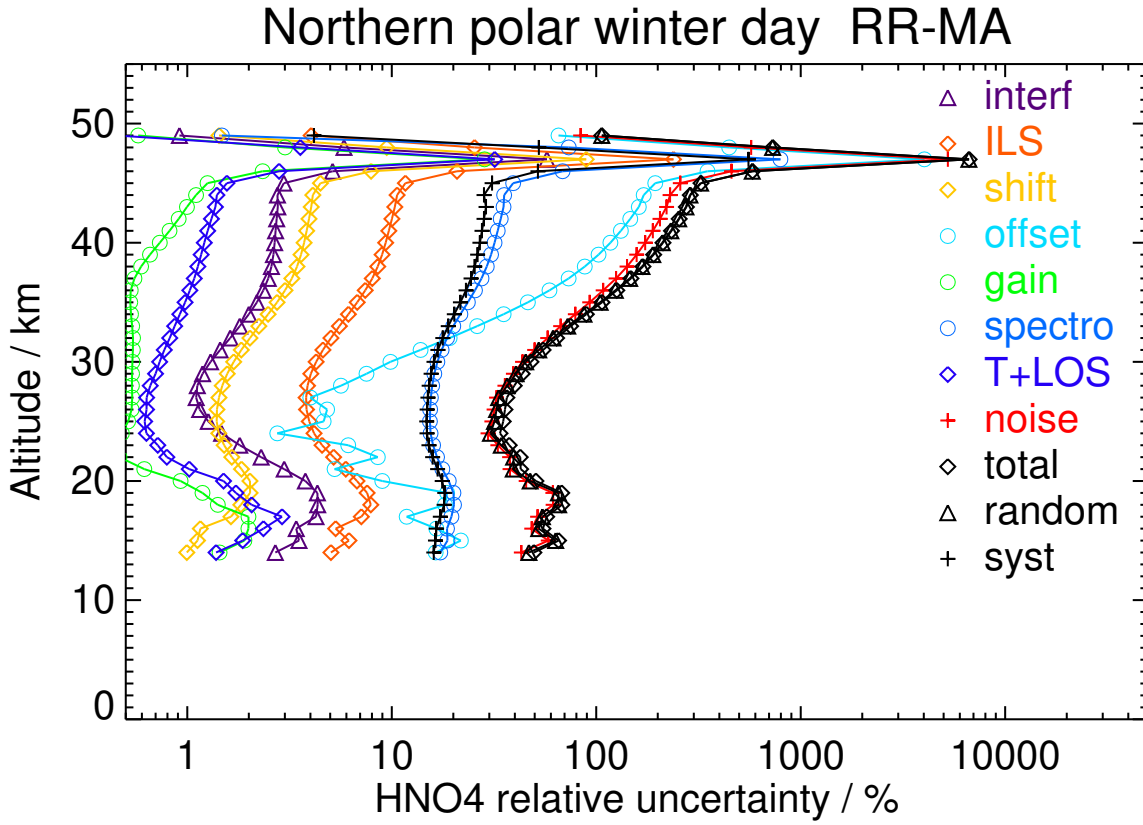


Figure S69: V8R_HNO₄.562 Northern polar winter day

Table S74: HNO₄ 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)
15	28.35	1.55	3.00	0.50	9.79	0.72	7.34	0.69	26.64	28.96	5.82	29.53
18	23.78	1.56	1.98	0.64	9.81	0.48	6.09	0.90	34.10	35.84	4.38	36.11
21	17.85	1.70	2.62	0.89	3.37	0.32	7.25	0.63	28.87	29.66	5.36	30.14
24	36.32	1.49	3.01	1.08	4.57	0.40	8.44	0.50	37.06	37.84	6.81	38.45
27	55.65	1.27	3.20	1.21	8.09	0.29	9.80	0.49	43.13	44.36	8.25	45.12
30	56.36	1.20	3.40	1.32	14.71	0.28	10.18	0.50	48.74	51.32	8.74	52.06
33	45.10	1.20	3.71	1.42	25.10	0.27	9.94	0.50	55.46	61.21	8.67	61.83
36	28.14	1.18	4.10	1.50	38.36	0.31	9.78	0.53	64.96	75.73	8.55	76.21
39	16.15	1.15	4.53	1.53	53.01	0.41	9.91	0.61	76.91	93.67	8.59	94.06
42	6.83	1.15	4.94	1.52	67.54	0.51	10.17	0.73	89.79	112.60	8.73	112.94
45	-9.64	1.19	5.42	1.45	80.74	0.62	9.96	0.91	101.24	129.74	8.32	130.00
48	-35.36	1.31	6.00	1.34	92.78	0.66	10.01	1.16	111.51	145.31	8.32	145.55
52	-95.51	1.62	6.91	1.14	103.64	0.66	12.32	1.56	122.00	160.36	10.79	160.72

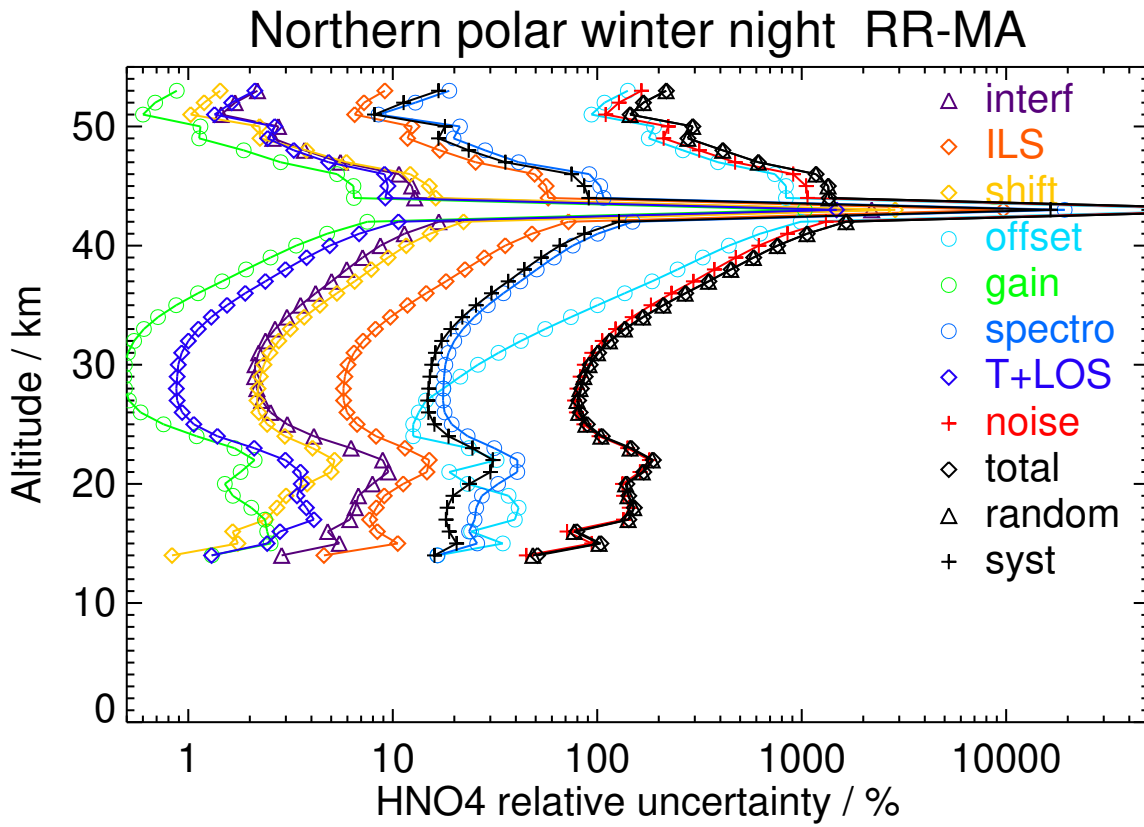


Figure S70: V8R_HNO₄_562 Northern polar winter night

Table S75: HNO₄ 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)
18	97.21	1.46	2.79	0.81	10.78	0.91	16.61	1.16	34.74	36.93	15.73	40.15
21	125.02	1.41	2.36	1.00	5.31	0.80	18.78	0.98	27.51	28.54	18.26	33.88
24	122.12	1.41	2.28	1.14	3.03	0.76	19.35	1.00	33.60	34.27	18.66	39.02
27	99.14	1.19	2.23	1.26	4.51	0.66	17.02	0.88	39.47	40.21	16.13	43.32
30	80.26	0.94	2.69	1.49	7.59	0.50	14.06	0.75	45.08	46.13	13.04	47.94
33	56.89	0.77	3.38	1.73	12.55	0.38	11.24	0.63	49.53	51.43	10.38	52.46
36	31.95	0.67	4.06	1.83	19.81	0.28	9.18	0.54	53.44	57.26	8.59	57.91
39	9.88	0.71	4.65	1.76	29.73	0.23	8.17	0.57	58.82	66.15	7.77	66.60
42	-4.93	0.90	5.18	1.55	41.95	0.26	8.14	0.74	67.49	79.71	7.66	80.07
45	-14.74	1.14	5.69	1.32	55.42	0.31	8.70	0.97	79.60	97.25	7.92	97.57
48	-21.23	1.37	6.17	1.14	68.63	0.35	9.36	1.18	92.83	115.71	8.31	116.00
52	-25.47	1.58	6.68	1.01	83.48	0.39	9.97	1.37	107.79	136.61	8.75	136.89

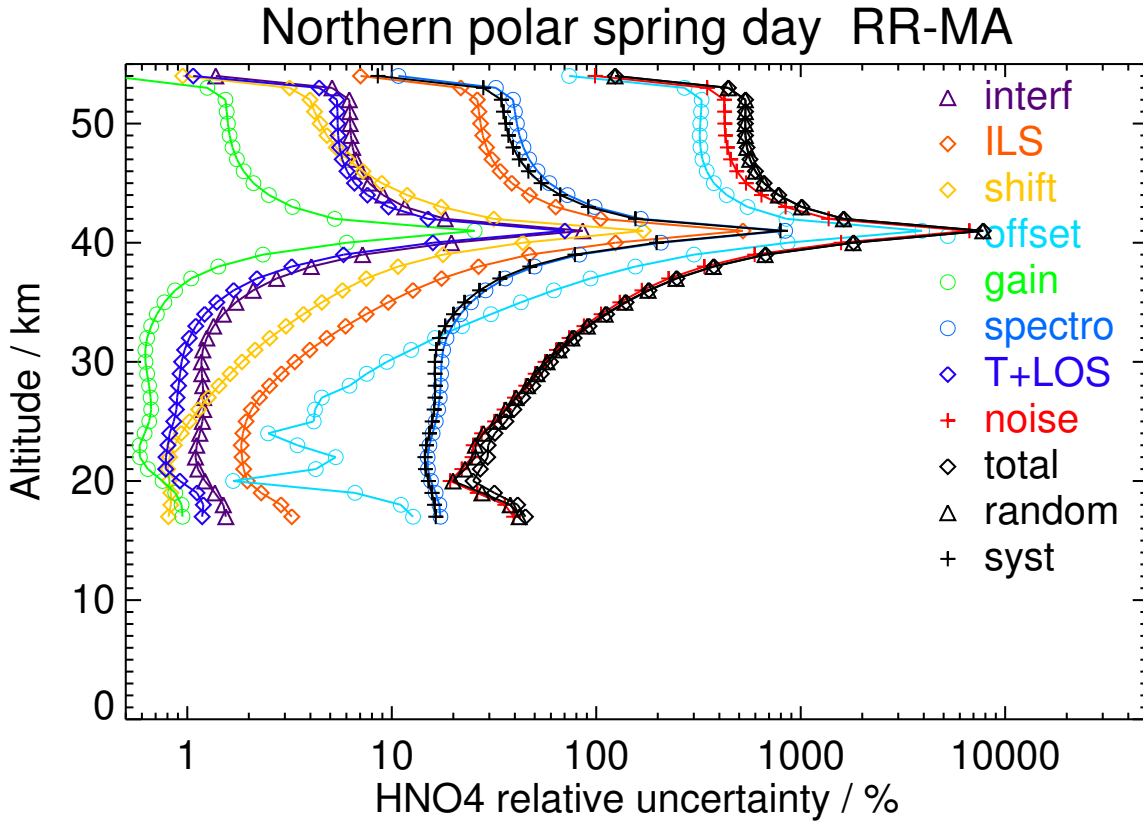


Figure S71: V8R_HNO₄_562 Northern polar spring day

Table S76: HNO₄ 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)
18	96.01	1.47	2.84	0.75	10.81	0.89	16.62	1.14	34.49	36.68	15.83	39.95
21	136.67	1.41	2.46	0.96	5.18	0.78	20.13	0.94	27.07	27.87	19.97	34.29
24	148.63	1.41	2.35	1.15	3.02	0.83	22.33	1.05	33.38	33.90	21.98	40.40
27	118.23	1.19	2.31	1.34	4.33	0.76	20.01	0.99	39.15	39.83	19.39	44.30
30	89.36	0.93	2.94	1.61	7.08	0.56	16.46	0.82	44.43	45.40	15.73	48.05
33	71.71	0.76	3.71	1.88	11.61	0.42	13.53	0.65	48.59	50.29	12.96	51.94
36	55.85	0.67	4.34	2.02	18.72	0.32	11.64	0.56	52.34	55.87	11.33	57.00
39	45.66	0.70	4.81	1.97	28.67	0.25	10.86	0.60	57.81	64.79	10.58	65.65
42	39.16	0.87	5.16	1.78	41.05	0.25	10.98	0.77	66.82	78.70	10.41	79.38
45	35.53	1.10	5.50	1.55	54.65	0.29	11.52	1.00	79.22	96.53	10.57	97.11
48	36.44	1.30	5.84	1.37	67.92	0.32	12.07	1.22	92.60	115.13	10.83	115.64
52	35.41	1.50	6.29	1.23	82.08	0.36	12.03	1.42	107.14	135.24	10.85	135.67

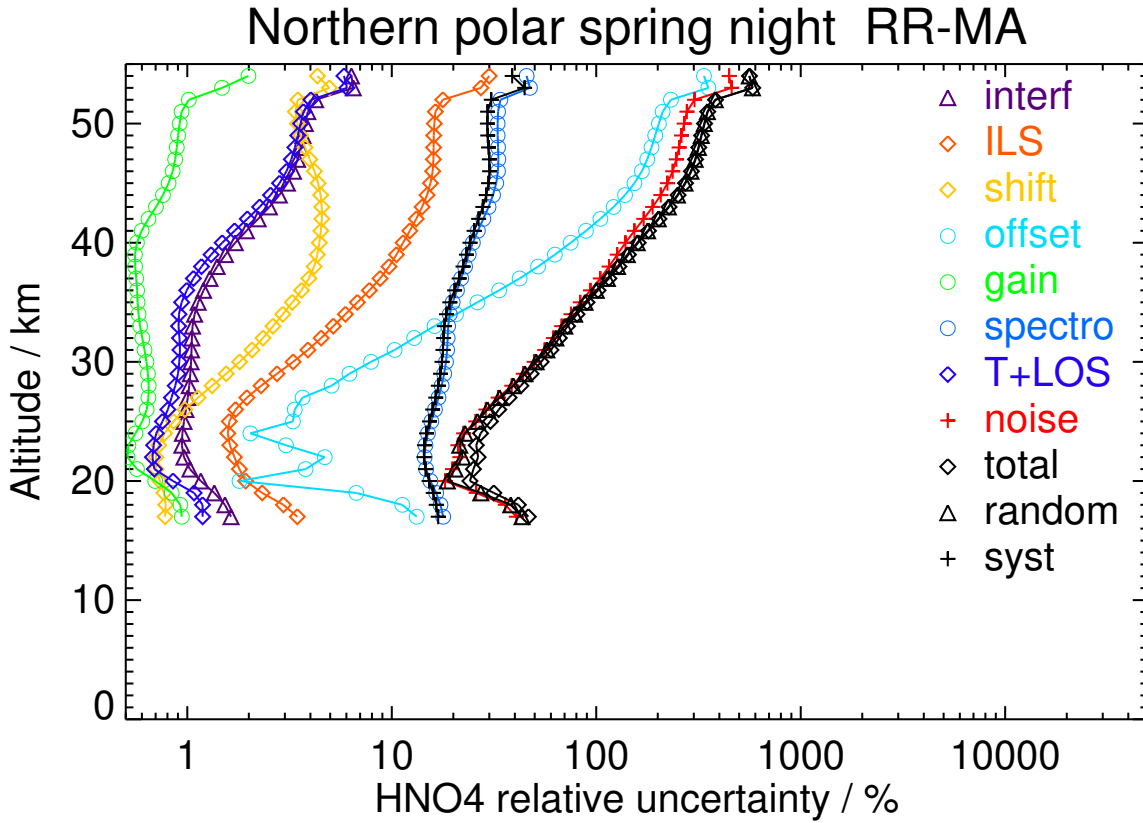


Figure S72: V8R_HNO₄_562 Northern polar spring night

Table S77: HNO₄ error budget for Northern polar summer day. All uncertainties are 1 σ .

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)
18	95.55	1.70	2.66	0.54	8.93	0.87	15.20	1.07	29.43	31.12	14.84	34.48
21	111.76	1.49	2.62	0.73	5.41	0.93	17.21	0.91	24.33	25.22	17.10	30.48
24	126.03	1.44	3.10	0.98	2.81	0.92	19.37	0.84	28.14	28.74	19.07	34.49
27	118.17	1.18	2.88	1.24	2.65	0.84	18.73	0.79	32.70	33.28	18.21	37.94
30	99.45	0.92	3.08	1.59	3.52	0.63	15.96	0.73	37.01	37.54	15.53	40.62
33	78.19	0.77	3.51	1.86	4.98	0.52	12.81	0.65	41.18	41.80	12.41	43.61
36	50.32	0.65	4.15	1.92	7.91	0.44	10.22	0.56	44.79	45.78	9.97	46.85
39	28.11	0.66	4.83	1.73	13.27	0.37	8.91	0.55	48.30	50.36	8.91	51.14
42	25.29	0.86	5.35	1.38	21.81	0.37	9.17	0.72	52.56	57.20	9.08	57.92
45	40.52	1.12	5.92	1.02	33.26	0.46	10.52	0.98	60.28	69.20	10.02	69.92
48	58.65	1.36	6.62	0.75	46.46	0.59	12.12	1.25	72.21	86.27	11.20	86.99
52	71.57	1.63	7.59	0.56	63.76	0.72	13.77	1.53	90.64	111.25	12.53	111.96
56	73.30	1.82	8.36	0.55	77.28	0.79	14.66	1.68	105.59	131.27	13.39	131.95
60	85.26	1.97	9.14	0.55	84.92	0.89	14.35	1.75	113.67	142.18	14.60	142.93

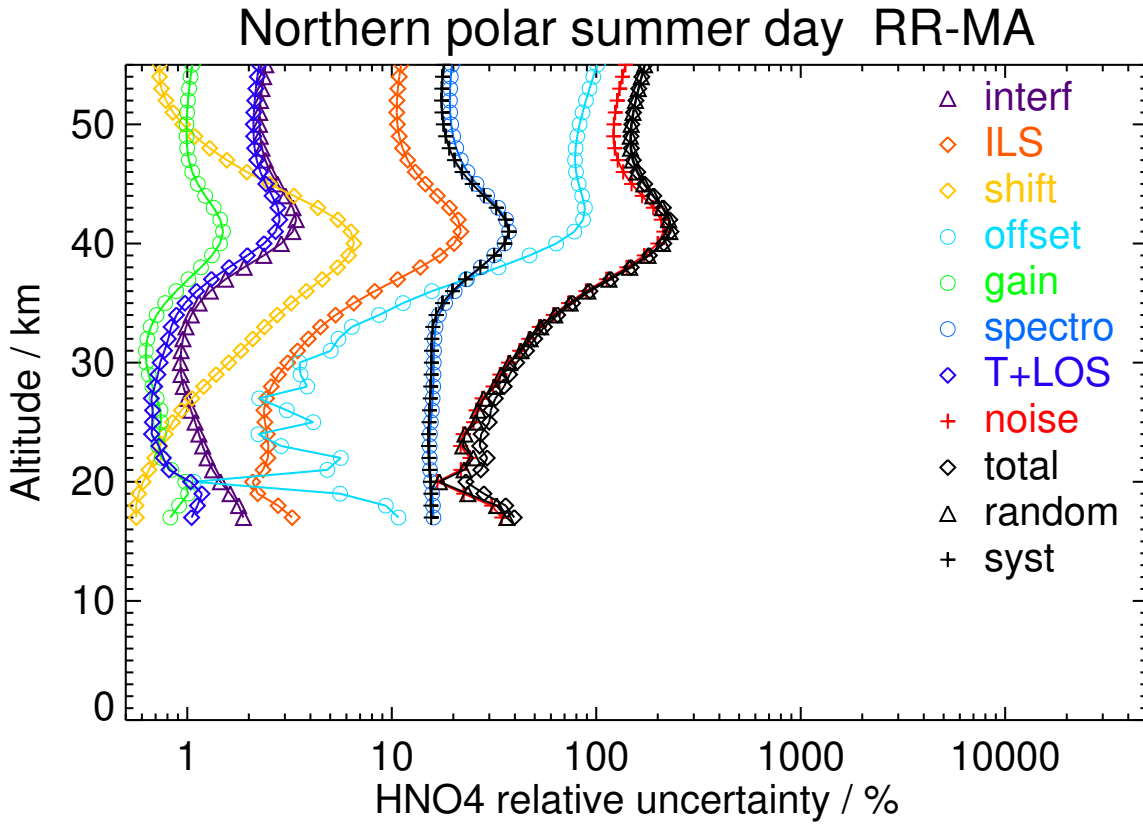


Figure S73: V8R_HNO₄_562 Northern polar summer day

Table S78: HNO₄ 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)
18	83.74	1.60	2.54	0.53	9.98	0.77	13.60	0.92	30.24	32.23	13.06	34.78
21	107.62	1.44	2.41	0.74	5.48	0.78	16.35	0.84	24.33	25.24	16.19	29.99
24	130.51	1.41	3.08	1.00	2.75	0.76	20.34	0.81	29.06	29.73	19.90	35.77
27	140.07	1.16	2.98	1.25	3.00	0.86	21.83	0.79	34.04	34.97	20.85	40.71
30	124.39	0.91	3.10	1.57	4.37	0.74	19.42	0.81	38.94	39.78	18.54	43.89
33	84.12	0.76	3.50	1.84	7.12	0.57	15.22	0.74	43.53	44.54	14.49	46.84
36	49.26	0.66	4.12	1.98	12.28	0.42	11.47	0.59	47.38	49.29	10.91	50.49
39	28.20	0.67	4.71	1.91	20.57	0.30	8.98	0.53	51.97	56.17	8.73	56.84
42	11.80	0.84	5.13	1.67	31.95	0.24	7.70	0.64	59.35	67.63	7.70	68.06
45	2.04	1.08	5.52	1.40	45.28	0.25	7.24	0.85	70.94	84.35	7.41	84.67
48	0.12	1.28	5.95	1.19	58.90	0.27	7.17	1.07	84.79	103.40	7.51	103.68
52	1.64	1.47	6.49	1.06	74.60	0.29	7.26	1.28	101.57	126.17	7.84	126.41

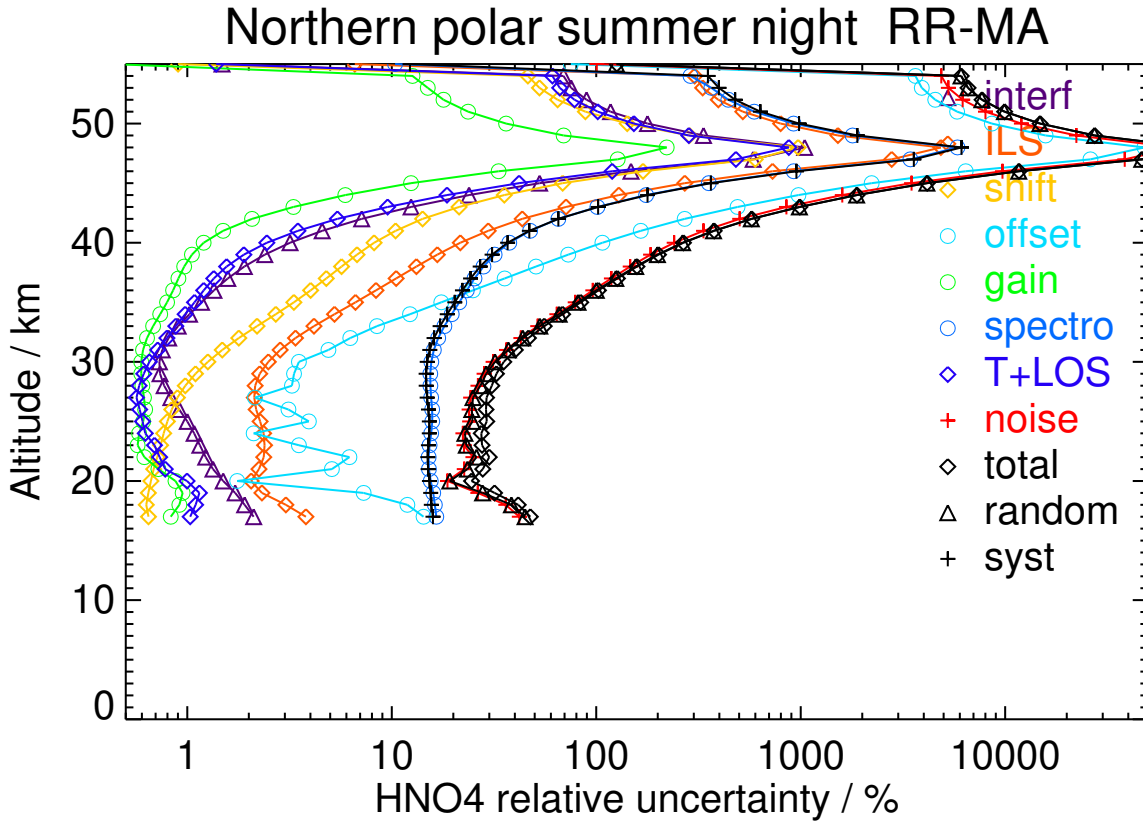


Figure S74: V8R_HNO₄.562 Northern polar summer night

Table S79: HNO₄ 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)
18	50.39	1.67	2.31	0.58	11.10	0.70	9.61	0.94	34.45	36.69	8.15	37.58
21	60.95	1.64	2.07	0.74	4.64	0.44	10.72	0.73	25.89	26.82	9.79	28.55
24	82.55	1.49	2.53	0.94	2.73	0.39	13.83	0.67	33.03	33.92	12.22	36.05
27	87.09	1.25	2.55	1.10	4.59	0.52	14.65	0.69	38.98	40.00	12.87	42.02
30	71.78	1.22	2.81	1.27	8.71	0.46	12.95	0.68	44.72	46.02	11.73	47.49
33	49.12	1.25	3.24	1.45	15.83	0.32	10.73	0.61	50.15	52.84	10.16	53.81
36	25.70	1.20	3.73	1.60	26.05	0.20	9.41	0.54	56.53	62.44	9.09	63.10
39	13.34	1.11	4.24	1.68	38.72	0.22	9.14	0.55	65.91	76.64	8.68	77.13
42	10.30	1.07	4.70	1.68	52.62	0.33	9.50	0.65	78.27	94.53	8.68	94.93
45	9.02	1.11	5.09	1.62	66.36	0.43	10.02	0.80	91.76	113.47	8.86	113.81
48	6.37	1.18	5.40	1.56	78.70	0.50	10.45	0.95	104.10	130.74	9.04	131.05
52	-36.15	1.36	6.07	1.36	90.98	0.60	7.98	1.15	116.22	147.70	8.79	147.96

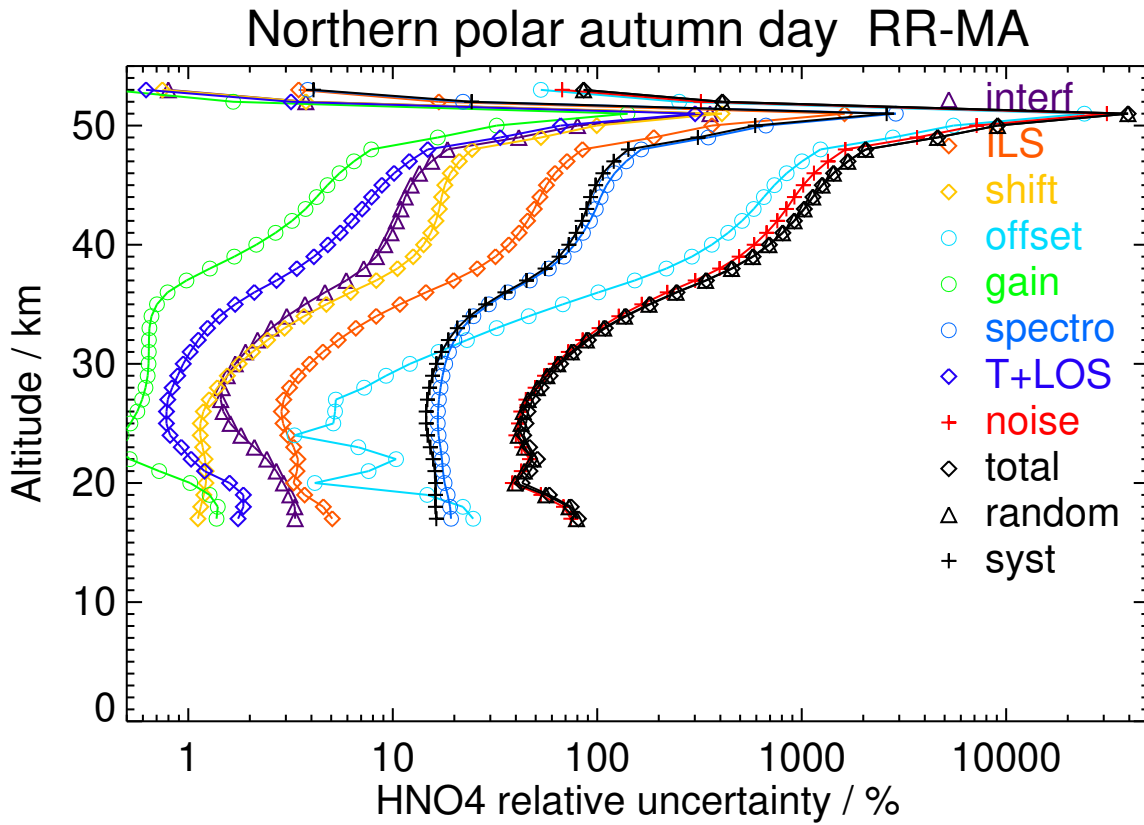


Figure S75: V8R_HNO₄_562 Northern polar autumn day

Table S80: HNO₄ 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)
18	33.53	1.69	2.33	0.59	11.52	0.61	7.71	0.87	35.84	38.03	6.31	38.55
21	46.12	1.63	1.93	0.71	4.08	0.32	8.20	0.65	25.81	26.45	7.60	27.52
24	64.42	1.51	2.16	0.83	2.94	0.26	9.99	0.61	33.95	34.39	9.30	35.63
27	59.92	1.28	2.20	0.93	5.22	0.28	10.00	0.63	40.16	40.76	9.31	41.81
30	38.75	1.20	2.52	1.06	10.26	0.21	9.27	0.58	46.31	47.70	8.39	48.43
33	22.75	1.20	2.96	1.21	18.50	0.20	8.89	0.50	52.36	55.82	7.72	56.35
36	10.97	1.16	3.41	1.36	29.66	0.24	8.91	0.48	59.65	66.90	7.53	67.32
39	7.19	1.09	3.86	1.45	42.84	0.32	9.23	0.57	69.68	82.07	7.68	82.43
42	8.85	1.07	4.29	1.47	56.85	0.42	9.73	0.74	82.04	100.08	8.01	100.40
45	12.24	1.11	4.67	1.44	70.50	0.51	10.24	0.94	95.23	118.74	8.38	119.04
48	16.36	1.20	4.98	1.38	82.73	0.57	10.63	1.11	107.31	135.74	8.68	136.02
52	-6.95	1.36	5.59	1.37	92.32	0.61	9.70	1.30	116.60	148.98	7.40	149.17

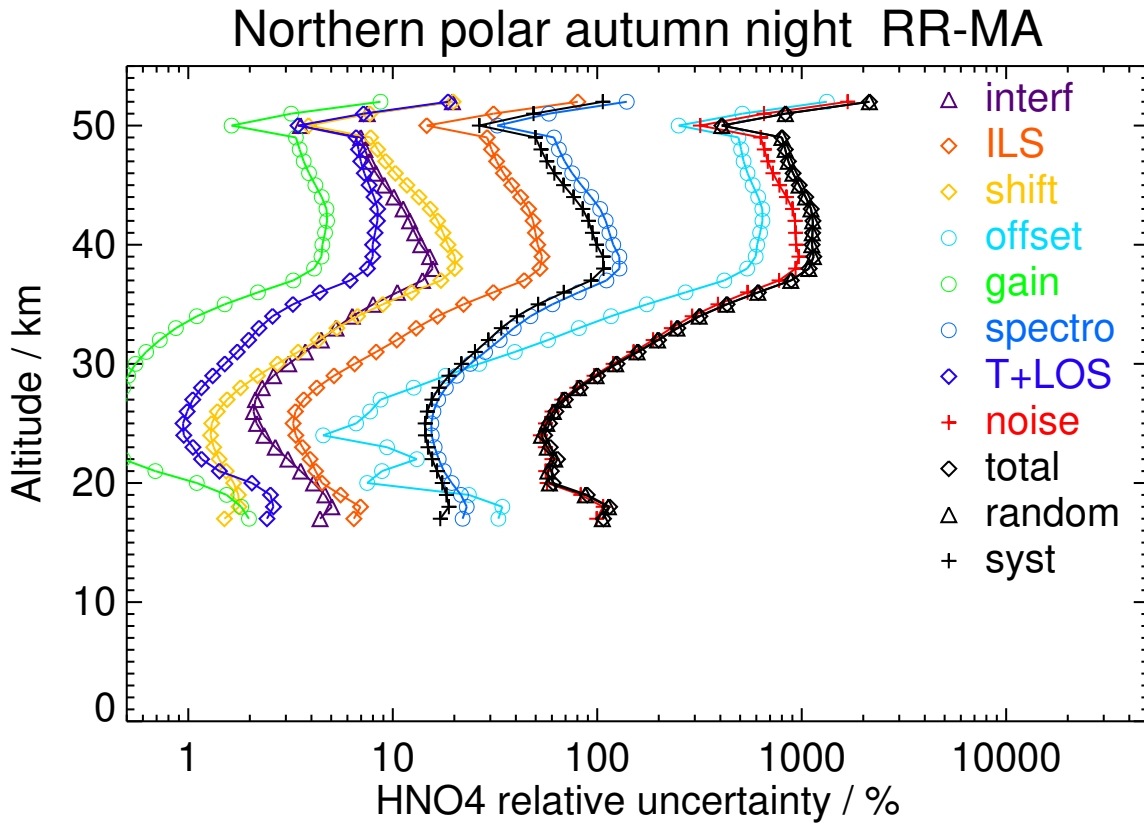


Figure S76: V8R_HNO₄.562 Northern polar autumn night

Table S81: HNO₄ error budget for Northern midlatitude winter day. All uncertainties are 1 σ .

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)
15	40.18	1.51	2.15	0.31	10.46	0.84	7.99	0.81	28.21	30.61	6.37	31.26
18	41.04	1.36	1.92	0.49	4.65	0.42	7.66	0.77	20.56	21.41	7.17	22.57
21	83.99	1.49	3.22	0.90	2.50	0.34	13.58	0.62	25.63	26.16	13.31	29.35
24	136.36	1.41	3.43	1.21	2.86	0.63	20.05	0.70	31.54	32.08	19.81	37.70
27	148.53	1.17	3.22	1.43	3.94	0.80	21.91	0.81	36.88	37.55	21.47	43.25
30	120.44	0.96	3.19	1.62	6.78	0.75	19.33	0.83	41.93	42.87	18.85	46.83
33	82.96	0.90	3.59	1.80	12.62	0.57	15.51	0.70	46.62	48.62	15.07	50.90
36	58.76	0.88	4.17	1.94	22.02	0.38	12.50	0.58	52.54	57.25	12.13	58.52
39	40.83	0.88	4.65	1.99	34.58	0.24	10.57	0.54	61.16	70.48	10.32	71.24
42	21.02	0.95	5.03	1.94	48.93	0.28	9.45	0.60	73.31	88.33	9.31	88.82
45	6.88	1.05	5.35	1.85	63.39	0.37	8.93	0.73	87.17	107.94	8.82	108.30
48	0.48	1.15	5.63	1.76	76.47	0.44	8.76	0.85	100.05	126.08	8.64	126.37
52	-35.15	1.35	6.54	1.58	84.86	0.31	10.22	0.99	108.28	137.79	9.66	138.12

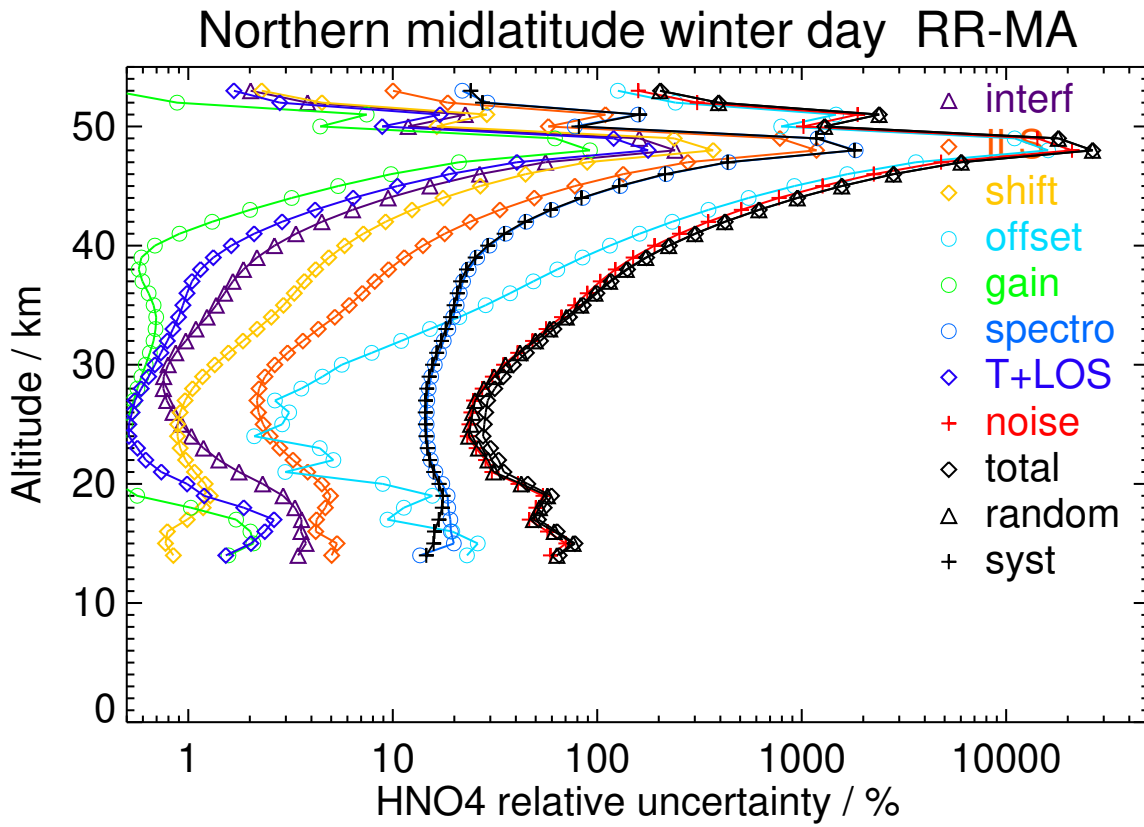


Figure S77: V8R_HNO₄.562 Northern midlatitude winter day

Table S82: HNO₄ 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)
15	18.64	1.48	2.87	0.44	11.01	0.72	7.44	0.77	30.61	33.12	5.31	33.55
18	41.77	1.37	2.32	0.59	5.03	0.42	8.18	0.82	21.81	22.86	7.33	24.00
21	89.69	1.46	3.22	0.97	5.12	0.37	14.20	0.67	27.18	28.17	13.67	31.31
24	127.14	1.41	3.57	1.27	4.34	0.56	19.68	0.71	32.20	33.05	19.19	38.22
27	147.29	1.18	3.41	1.48	4.56	0.69	21.61	0.80	37.27	38.02	21.16	43.51
30	125.40	0.99	3.38	1.68	7.14	0.62	19.64	0.84	42.54	43.54	19.15	47.57
33	85.88	0.94	3.82	1.88	12.48	0.46	16.05	0.73	47.28	49.27	15.54	51.66
36	51.11	0.92	4.48	2.02	21.24	0.29	13.12	0.61	52.33	56.83	12.54	58.20
39	27.67	0.91	5.02	2.06	33.04	0.23	11.60	0.55	59.86	68.72	10.82	69.57
42	9.29	0.97	5.40	1.99	46.88	0.33	11.11	0.61	71.30	85.67	10.01	86.26
45	-2.16	1.07	5.72	1.90	61.17	0.43	11.08	0.73	85.11	105.13	9.71	105.58
48	-6.44	1.16	5.99	1.82	74.26	0.49	11.16	0.85	98.18	123.40	9.64	123.78
52	-33.41	1.31	6.52	1.69	84.73	0.45	9.85	1.01	108.77	138.13	8.77	138.41

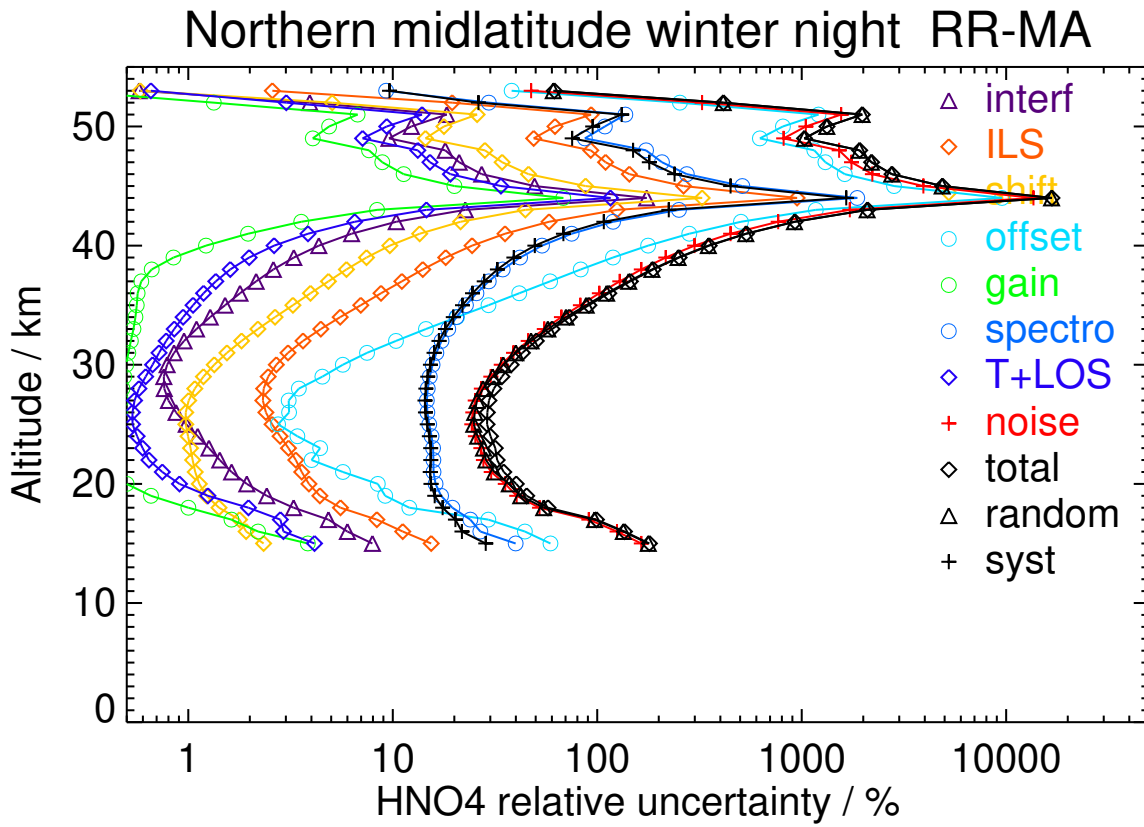


Figure S78: V8R_HNO₄_562 Northern midlatitude winter night

Table S83: HNO₄ error budget for Northern midlatitude spring day. All uncertainties are 1 σ .

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)
18	73.64	1.47	2.60	0.54	10.54	0.66	14.01	1.01	33.79	35.95	12.93	38.21
21	142.44	1.44	2.81	0.84	5.29	0.66	21.50	0.84	26.64	27.57	21.25	34.81
24	204.73	1.43	3.00	1.22	2.86	1.05	29.68	1.00	31.84	32.48	29.37	43.79
27	201.38	1.19	2.54	1.57	3.57	1.24	30.41	1.15	36.47	37.28	29.84	47.76
30	157.99	1.02	2.76	1.94	5.32	1.01	25.32	1.11	41.09	42.01	24.65	48.71
33	100.79	0.99	3.56	2.20	8.46	0.71	18.64	0.92	45.05	46.26	18.11	49.68
36	60.15	0.95	4.44	2.26	14.34	0.46	13.46	0.70	48.54	50.95	13.16	52.62
39	32.62	0.91	5.07	2.12	23.55	0.30	10.63	0.59	53.53	58.78	10.45	59.70
42	16.77	0.98	5.49	1.88	35.73	0.26	9.68	0.64	62.32	72.12	9.34	72.72
45	11.06	1.11	5.87	1.65	49.53	0.29	9.73	0.80	75.13	90.26	9.10	90.72
48	9.92	1.24	6.26	1.50	63.10	0.31	10.10	0.96	89.18	109.53	9.24	109.91
52	8.68	1.36	6.68	1.41	78.12	0.34	10.50	1.11	104.66	130.87	9.52	131.21

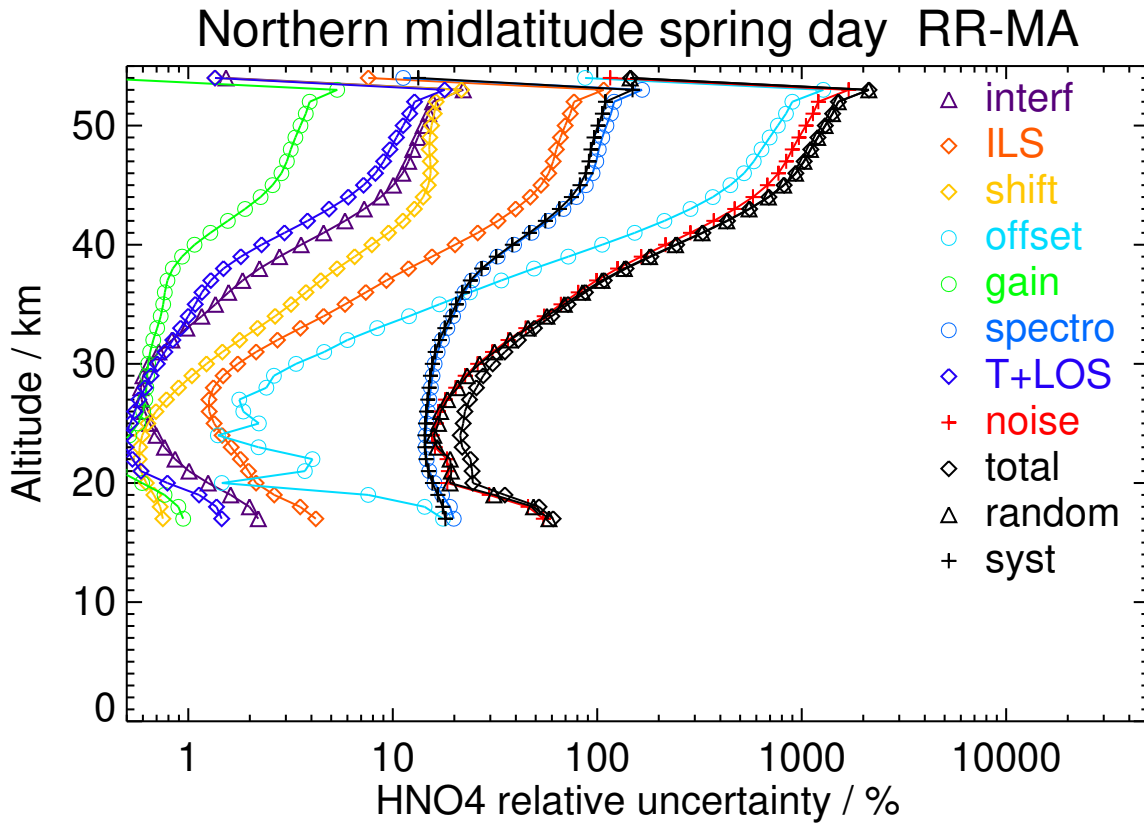


Figure S79: V8R_HNO₄.562 Northern midlatitude spring day

Table S84: HNO₄ 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)
18	89.57	1.44	2.43	0.55	10.59	0.86	15.70	1.09	33.43	35.72	14.50	38.55
21	139.33	1.42	2.63	0.82	5.29	0.74	21.44	0.86	26.38	27.44	21.01	34.56
24	189.10	1.43	2.95	1.17	2.94	0.95	28.14	0.98	32.05	32.83	27.64	42.91
27	190.60	1.20	2.65	1.50	3.87	1.09	28.99	1.09	37.27	38.20	28.26	47.51
30	152.25	1.02	2.91	1.85	5.78	0.91	24.88	1.05	42.17	43.21	24.05	49.45
33	107.75	0.98	3.61	2.12	9.36	0.67	19.11	0.89	46.26	47.65	18.47	51.11
36	68.78	0.93	4.33	2.23	15.55	0.45	14.33	0.70	49.78	52.51	13.90	54.32
39	35.45	0.90	4.88	2.14	24.92	0.31	11.50	0.61	54.83	60.56	11.05	61.56
42	16.19	0.97	5.24	1.93	37.12	0.27	10.28	0.69	63.67	74.01	9.63	74.63
45	8.26	1.12	5.56	1.70	50.80	0.29	9.98	0.86	76.37	92.01	9.09	92.46
48	4.33	1.27	5.90	1.53	64.24	0.32	10.06	1.05	90.13	110.95	9.00	111.32
52	7.25	1.40	6.30	1.44	79.21	0.35	10.23	1.23	105.49	132.17	9.11	132.48

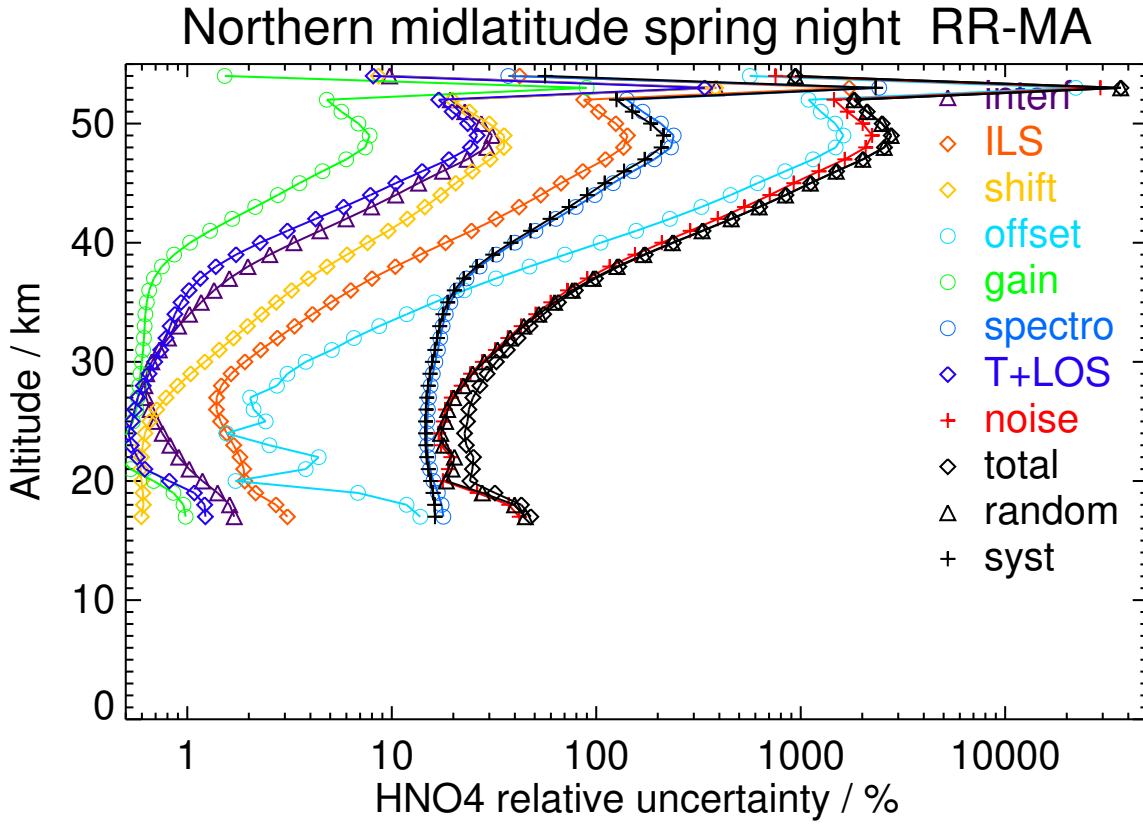


Figure S80: V8R_HNO₄_562 Northern midlatitude spring night

Table S85: HNO₄ 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)
18	77.94	1.55	2.39	0.45	9.54	0.74	13.44	0.97	32.06	33.92	12.61	36.18
21	122.95	1.47	2.77	0.73	5.11	0.69	19.11	0.81	25.54	26.42	18.90	32.48
24	180.04	1.45	3.50	1.14	2.67	0.97	27.13	0.88	30.05	30.67	26.88	40.79
27	202.12	1.19	3.08	1.53	3.03	1.22	29.75	1.01	34.39	35.02	29.44	45.75
30	169.05	1.02	2.89	1.91	4.12	1.04	26.04	1.06	38.72	39.37	25.69	47.01
33	113.06	1.02	3.36	2.17	6.14	0.77	19.50	0.94	42.79	43.62	19.09	47.61
36	62.15	0.96	4.22	2.20	10.26	0.53	13.88	0.72	46.22	47.72	13.48	49.59
39	34.87	0.89	4.96	2.02	17.49	0.35	10.57	0.59	50.15	53.43	10.34	54.42
42	26.65	0.94	5.46	1.70	28.03	0.25	9.27	0.64	56.51	63.35	9.22	64.02
45	33.00	1.10	5.95	1.40	41.01	0.26	9.16	0.82	67.30	79.06	9.16	79.59
48	40.28	1.26	6.50	1.20	54.70	0.29	9.50	1.02	81.18	98.13	9.52	98.59
52	40.82	1.42	7.17	1.09	70.93	0.33	9.95	1.21	98.70	121.76	10.06	122.18
56	64.79	1.61	7.85	0.92	81.34	0.49	8.59	1.44	109.52	136.53	10.51	136.94

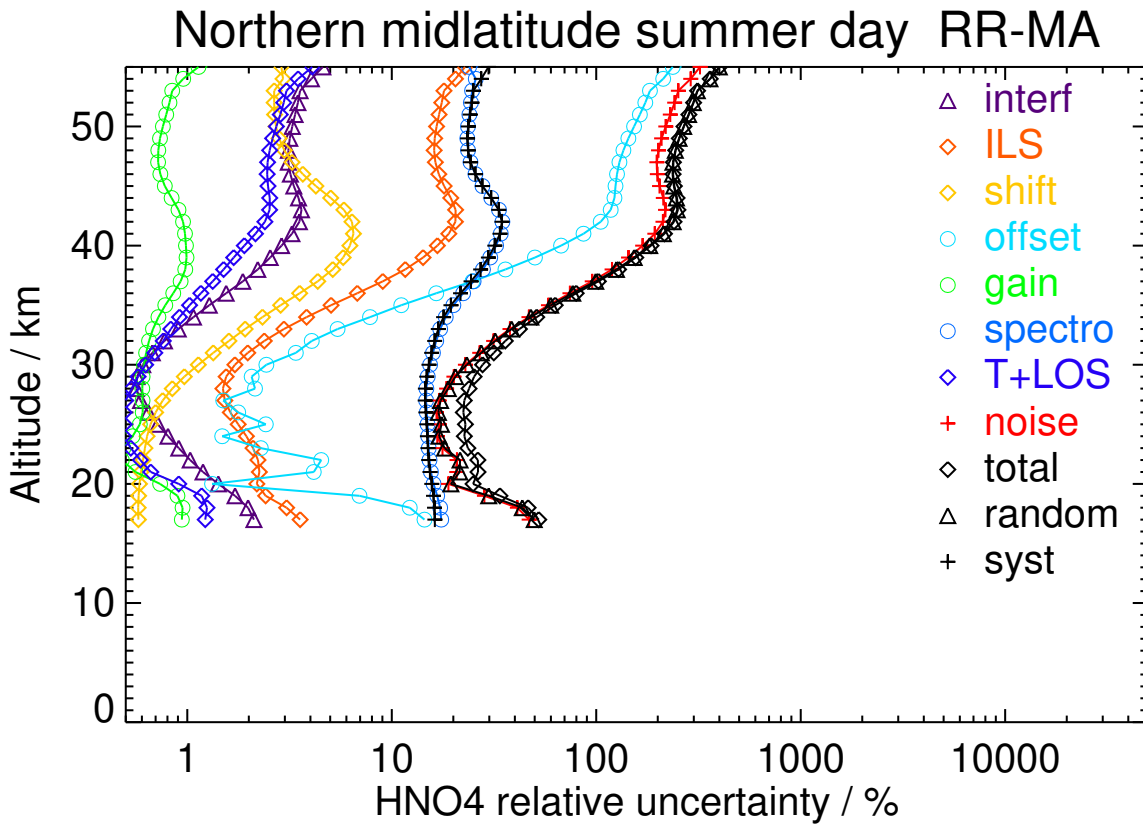


Figure S81: V8R_HNO₄_562 Northern midlatitude summer day

Table S86: HNO₄ 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)
18	84.97	1.53	2.41	0.45	9.57	0.78	14.06	1.04	32.03	33.88	13.32	36.40
21	127.56	1.45	2.76	0.72	4.93	0.73	19.68	0.80	25.05	25.80	19.62	32.41
24	192.52	1.44	3.44	1.13	2.53	1.03	27.82	0.90	29.79	30.25	27.74	41.04
27	200.68	1.20	3.02	1.50	2.95	1.21	29.98	1.03	34.09	34.61	29.78	45.66
30	168.74	1.03	2.96	1.89	3.95	0.98	26.16	1.04	38.30	38.94	25.81	46.72
33	119.91	1.03	3.44	2.16	5.81	0.74	19.95	0.92	42.40	43.22	19.50	47.42
36	67.86	0.96	4.22	2.19	9.54	0.55	14.40	0.72	45.81	47.18	13.97	49.21
39	36.88	0.88	4.89	1.99	16.17	0.40	11.02	0.61	49.35	52.29	10.66	53.36
42	29.88	0.94	5.30	1.65	26.15	0.33	9.71	0.69	54.93	61.17	9.23	61.87
45	27.22	1.11	5.73	1.33	38.74	0.36	9.64	0.89	65.08	76.07	8.90	76.59
48	25.11	1.28	6.28	1.13	52.32	0.42	10.10	1.11	78.75	94.87	9.11	95.31
52	25.95	1.45	7.00	1.03	68.74	0.50	10.75	1.32	96.71	118.97	9.63	119.36
56	56.15	1.63	7.47	0.91	80.80	0.54	13.88	1.48	108.81	135.83	13.20	136.47

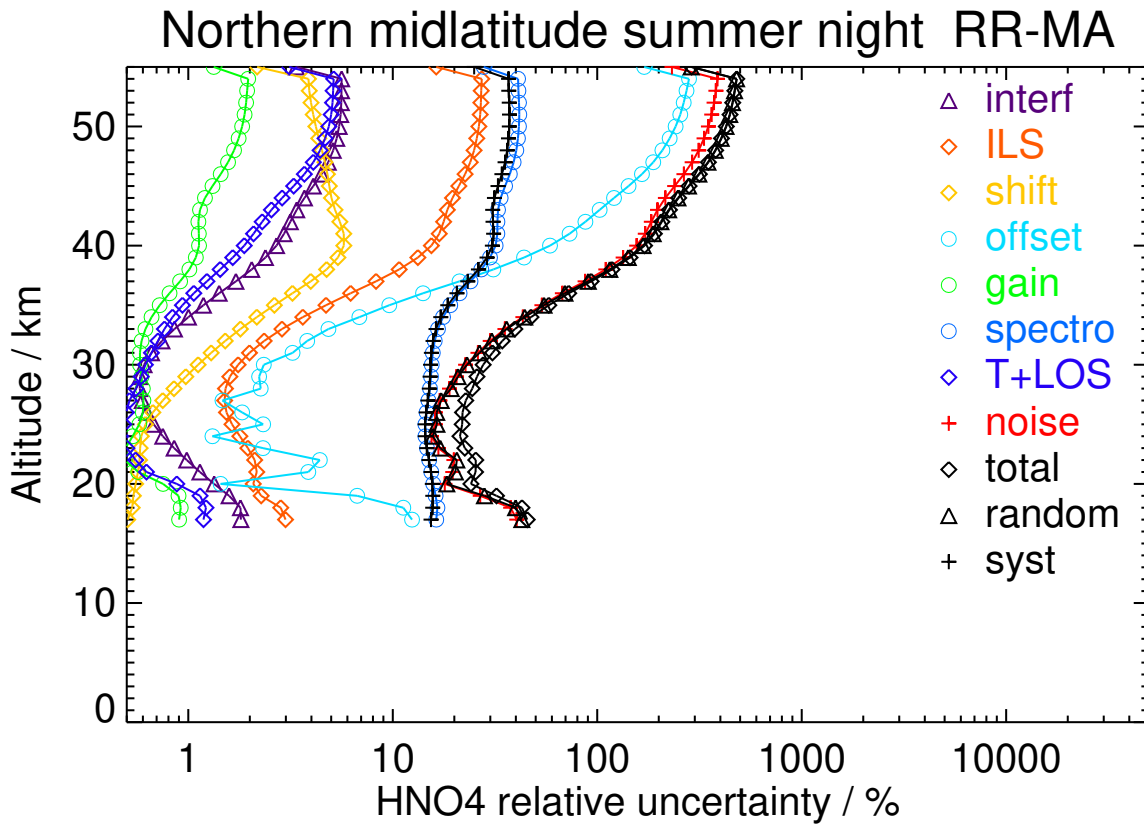


Figure S82: V8R_HNO₄_562 Northern midlatitude summer night

Table S87: HNO₄ 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)
18	49.40	1.49	2.29	0.47	11.09	0.58	9.53	0.87	34.34	36.49	8.36	37.44
21	80.86	1.42	2.30	0.71	4.41	0.38	13.14	0.68	25.06	25.75	12.85	28.78
24	134.59	1.41	3.03	1.06	2.57	0.51	20.05	0.73	31.73	32.29	19.64	37.79
27	160.93	1.17	2.91	1.36	3.69	0.81	23.13	0.85	36.95	37.67	22.54	43.90
30	137.02	0.98	2.99	1.64	6.04	0.79	21.11	0.92	41.87	42.81	20.41	47.43
33	89.67	0.93	3.48	1.89	10.65	0.60	16.78	0.83	46.27	47.91	16.06	50.53
36	51.87	0.90	4.16	2.05	18.39	0.39	12.86	0.66	50.86	54.44	12.25	55.80
39	25.87	0.88	4.75	2.07	29.27	0.26	10.23	0.57	57.96	65.21	9.85	65.94
42	11.54	0.93	5.17	1.98	42.40	0.25	8.74	0.62	68.95	81.15	8.61	81.61
45	5.86	1.04	5.50	1.85	56.25	0.31	7.98	0.75	82.62	100.11	8.08	100.44
48	2.99	1.15	5.79	1.74	69.14	0.35	7.64	0.89	95.98	118.43	7.92	118.70
52	7.98	1.31	6.21	1.59	80.89	0.30	7.44	1.09	107.88	134.97	8.08	135.21

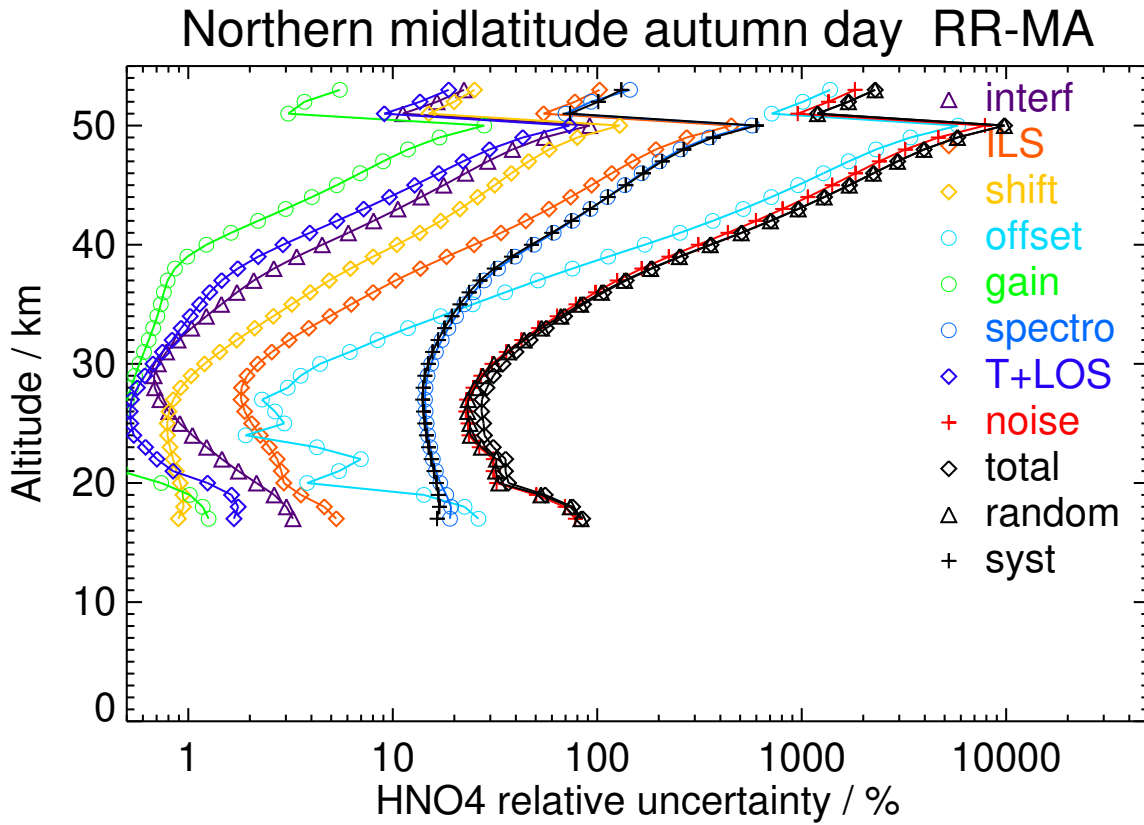


Figure S83: V8R_HNO₄_562 Northern midlatitude autumn day

Table S88: HNO₄ 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)
18	44.79	1.48	2.53	0.47	10.90	0.44	9.14	0.79	33.90	35.93	8.39	36.89
21	95.39	1.41	2.65	0.73	4.61	0.35	14.83	0.68	24.99	25.68	14.71	29.59
24	157.00	1.40	3.22	1.12	2.72	0.58	22.79	0.79	31.10	31.62	22.56	38.84
27	167.51	1.16	3.01	1.42	3.68	0.89	24.96	0.94	36.41	37.15	24.42	44.46
30	134.55	0.98	3.13	1.67	6.01	0.79	21.82	0.96	41.58	42.55	21.12	47.50
33	89.15	0.94	3.63	1.89	10.78	0.57	17.20	0.83	46.21	47.90	16.49	50.66
36	54.63	0.91	4.27	2.04	18.79	0.37	13.58	0.66	50.98	54.68	13.03	56.22
39	35.12	0.90	4.84	2.10	29.92	0.24	11.67	0.58	58.55	66.07	11.13	67.00
42	28.28	0.94	5.25	2.04	43.18	0.25	11.16	0.63	70.00	82.56	10.34	83.20
45	25.25	1.03	5.56	1.95	57.01	0.32	11.25	0.75	83.81	101.66	10.09	102.16
48	20.28	1.13	5.82	1.87	69.79	0.37	11.43	0.88	97.07	119.84	10.04	120.26
52	40.52	1.28	6.09	1.74	81.48	0.28	10.31	1.11	108.56	135.89	10.36	136.29

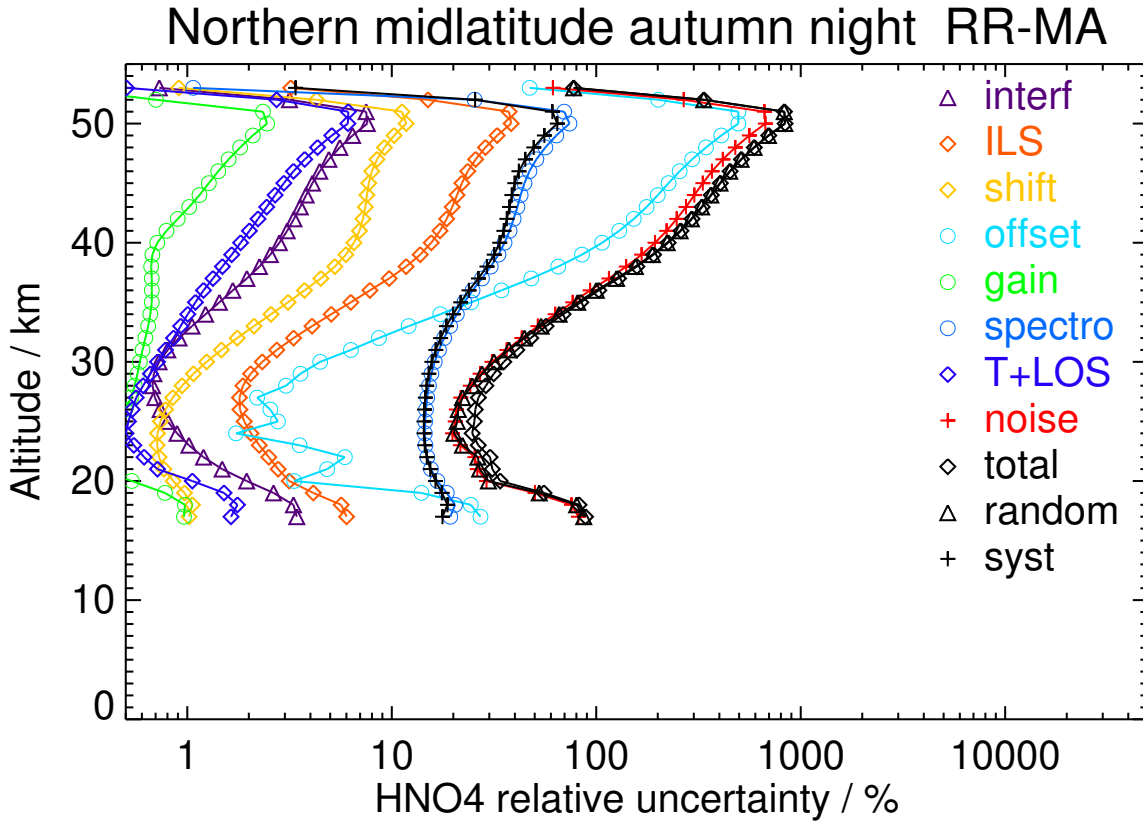


Figure S84: V8R_HNO₄.562 Northern midlatitude autumn night

Table S89: HNO₄ 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)
18	20.90	1.55	1.90	0.25	12.34	0.43	7.21	1.07	41.49	43.62	5.52	43.97
21	67.37	1.48	2.78	0.55	3.88	0.32	12.84	0.82	27.24	27.92	12.38	30.54
24	164.58	1.42	3.70	1.15	2.65	0.60	24.07	0.81	31.96	32.60	23.73	40.32
27	216.85	1.11	3.31	1.77	3.55	0.98	30.90	0.95	35.74	36.53	30.46	47.56
30	196.44	0.77	3.21	2.26	4.85	0.99	29.53	1.09	40.00	40.88	29.02	50.14
33	140.97	0.59	3.71	2.48	7.48	0.82	23.59	1.00	43.99	45.15	23.02	50.69
36	88.55	0.58	4.41	2.42	12.65	0.62	17.32	0.80	47.42	49.53	16.80	52.30
39	42.24	0.72	4.97	2.16	21.13	0.42	12.60	0.66	51.82	56.30	12.29	57.62
42	13.74	0.93	5.38	1.84	32.77	0.31	9.89	0.66	59.76	68.42	9.79	69.11
45	2.75	1.11	5.81	1.58	46.37	0.28	8.81	0.79	72.08	85.94	8.77	86.39
48	-2.19	1.25	6.27	1.43	60.03	0.30	8.56	0.95	86.28	105.32	8.53	105.66
52	-12.47	1.37	6.79	1.35	75.42	0.32	8.55	1.09	102.57	127.51	8.62	127.81

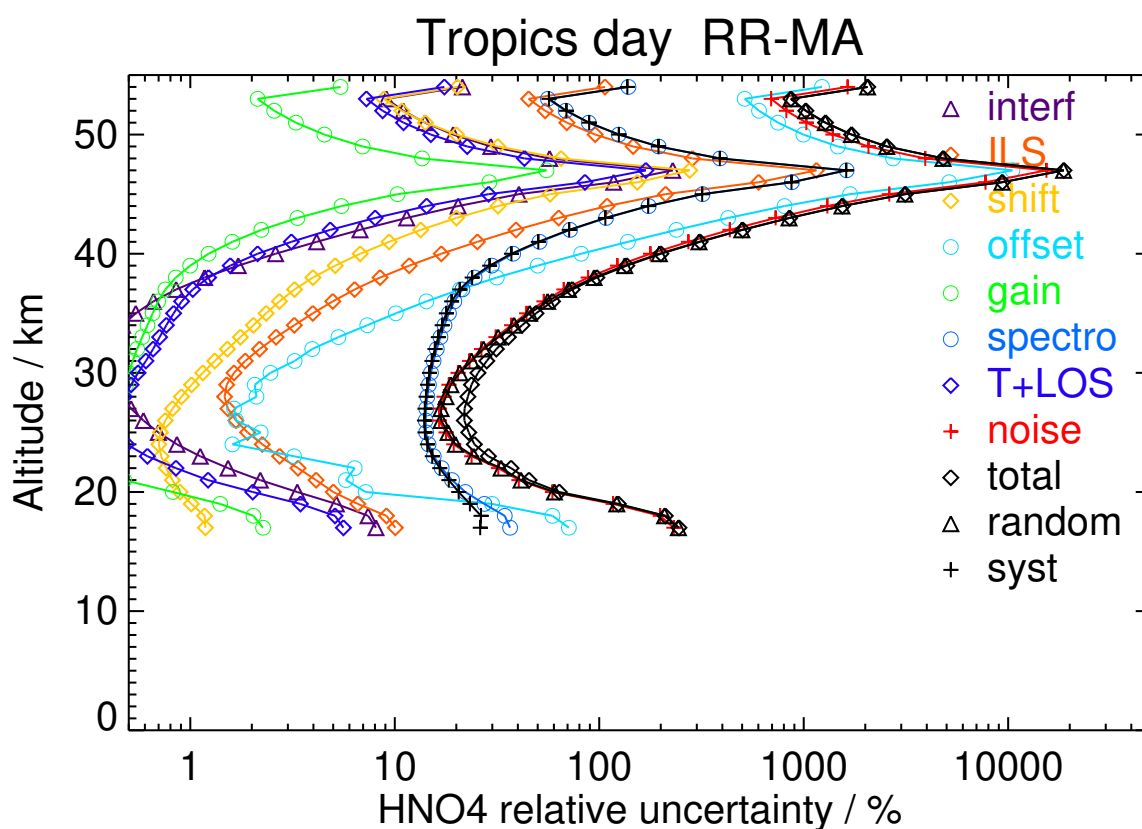


Figure S85: V8R_HNO₄_562 Tropics day

Table S90: HNO₄ 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)
18	11.89	1.56	2.10	0.25	12.44	0.38	7.23	1.09	41.45	43.63	5.45	43.97
21	68.65	1.48	2.92	0.55	3.52	0.33	13.09	0.89	27.00	27.68	12.59	30.40
24	170.42	1.41	3.82	1.15	2.59	0.62	25.13	0.80	32.01	32.71	24.74	41.01
27	231.62	1.11	3.47	1.77	3.50	1.01	32.82	0.95	35.62	36.36	32.47	48.75
30	219.10	0.77	3.25	2.26	4.75	1.03	31.97	1.12	39.85	40.52	31.77	51.49
33	159.56	0.59	3.62	2.48	7.47	0.87	26.06	1.05	44.01	44.91	26.01	51.90
36	104.92	0.59	4.33	2.44	12.72	0.67	19.89	0.85	47.53	49.46	19.91	53.31
39	72.78	0.72	4.98	2.21	21.15	0.50	15.82	0.70	51.93	56.39	15.66	58.52
42	54.70	0.92	5.42	1.90	32.72	0.39	13.98	0.70	59.62	68.40	13.31	69.68
45	44.78	1.11	5.84	1.63	46.24	0.38	13.47	0.84	71.79	85.81	12.25	86.68
48	41.73	1.26	6.29	1.46	59.87	0.40	13.47	1.01	85.97	105.16	11.90	105.84
52	43.15	1.38	6.80	1.39	75.19	0.44	13.60	1.16	102.19	127.25	11.84	127.80

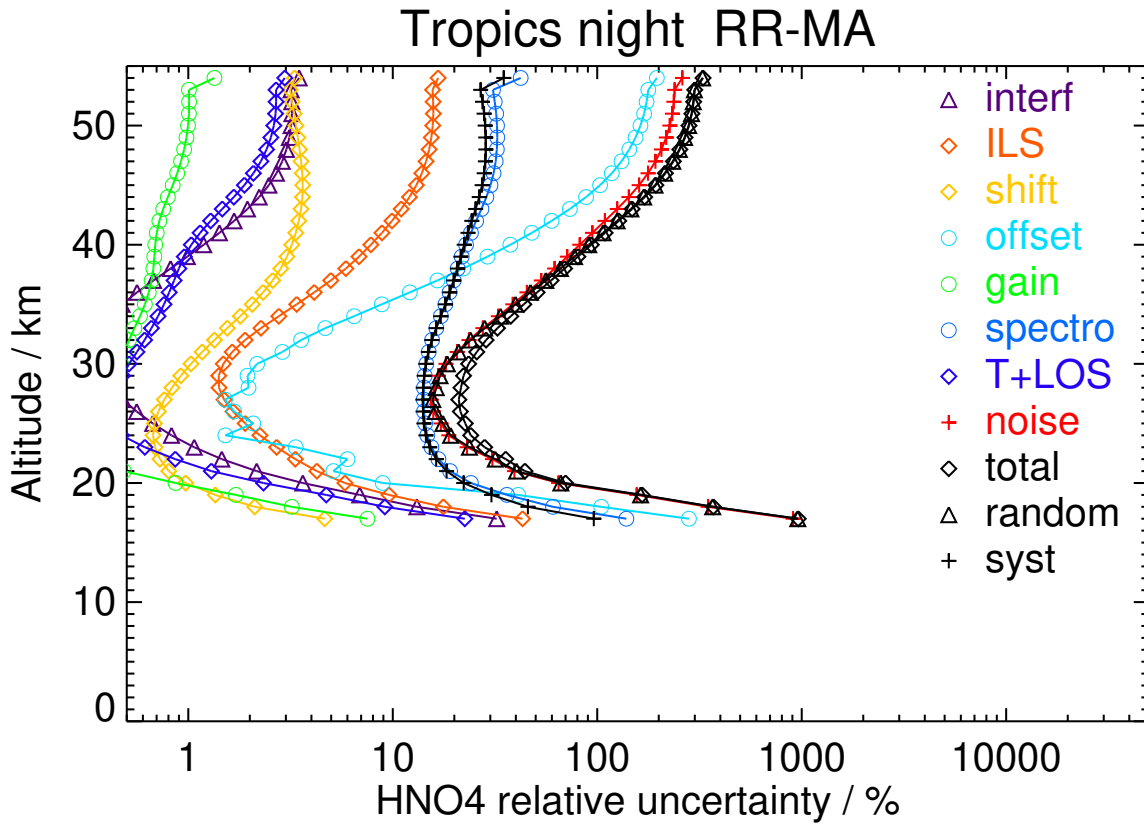


Figure S86: V8R_HNO₄_562 Tropics night

Table S91: HNO₄ error budget for Southern midlatitude winter day. All uncertainties are 1 σ .

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)
18	57.33	1.57	3.19	0.67	11.74	0.69	12.62	1.00	37.59	40.00	11.16	41.53
21	106.42	1.45	2.68	0.89	2.39	0.51	16.18	0.81	23.32	23.88	15.88	28.68
24	151.29	1.43	3.04	1.22	3.20	0.61	22.74	0.88	32.34	33.10	22.18	39.84
27	151.54	1.20	2.96	1.48	4.16	0.85	24.00	0.97	37.84	38.78	23.13	45.15
30	129.98	1.00	3.18	1.75	6.79	0.76	21.02	0.94	43.00	44.08	20.24	48.50
33	90.80	0.92	3.71	1.94	11.82	0.54	16.81	0.82	47.55	49.39	16.20	51.98
36	60.47	0.88	4.28	2.04	19.90	0.35	13.84	0.67	52.12	56.18	13.11	57.69
39	39.70	0.86	4.77	2.01	30.89	0.28	12.56	0.61	59.14	67.13	11.42	68.10
42	28.18	0.93	5.18	1.88	43.97	0.33	12.34	0.70	70.01	83.09	10.72	83.78
45	26.51	1.05	5.55	1.75	57.64	0.40	12.56	0.85	83.65	101.99	10.55	102.53
48	29.57	1.16	5.88	1.65	70.29	0.44	12.84	0.99	96.92	120.11	10.60	120.58
52	15.73	1.30	6.39	1.46	81.69	0.40	11.69	1.13	108.71	136.26	10.32	136.65

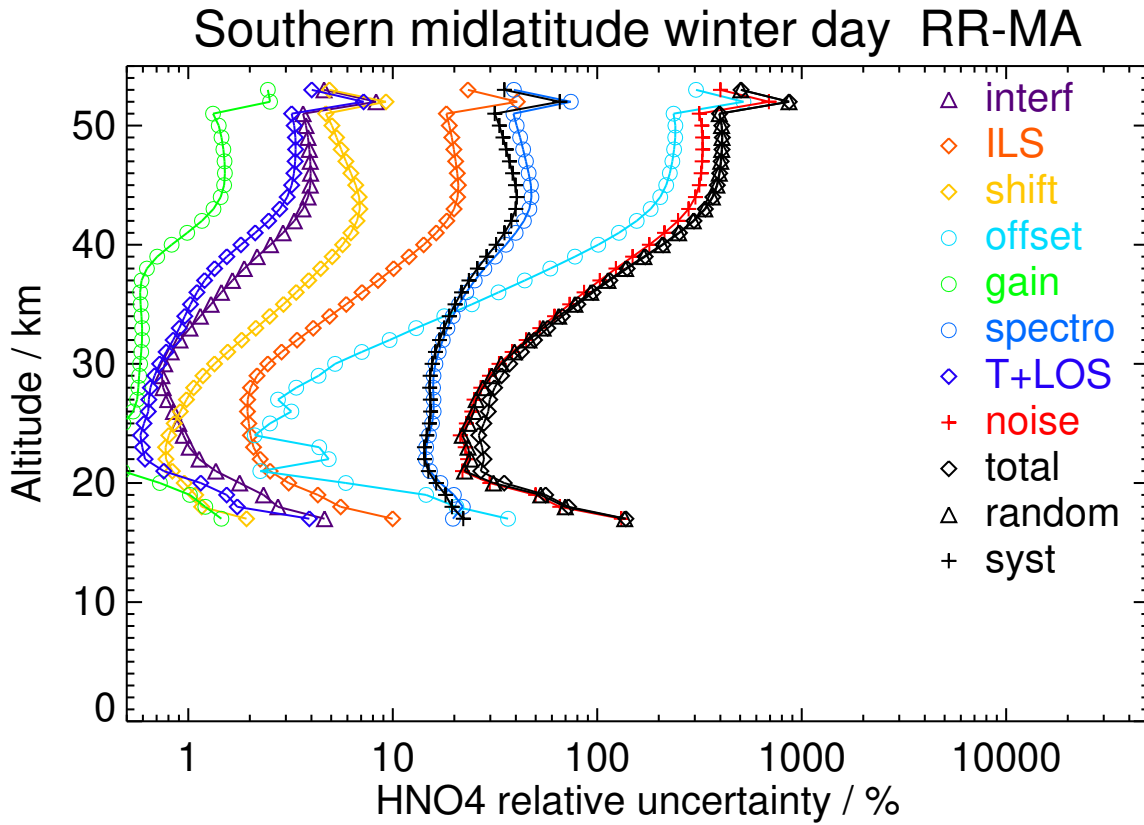


Figure S87: V8R_HNO₄.562 Southern midlatitude winter day

Table S92: HNO₄ 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)
18	52.78	1.48	2.64	0.65	12.07	0.70	11.53	1.04	39.80	42.21	9.61	43.29
21	87.63	1.41	2.35	0.85	3.17	0.50	14.07	0.79	26.36	27.15	13.23	30.20
24	129.34	1.40	2.64	1.10	3.47	0.50	18.91	0.78	34.86	35.68	17.96	39.95
27	133.00	1.19	2.58	1.30	5.36	0.66	20.24	0.86	40.85	41.87	19.12	46.03
30	108.57	0.98	2.99	1.54	9.45	0.59	18.50	0.84	46.52	47.95	17.58	51.08
33	88.33	0.88	3.70	1.77	15.93	0.43	16.39	0.73	51.35	54.13	15.72	56.37
36	75.71	0.83	4.40	1.91	25.05	0.31	15.38	0.64	56.45	62.16	14.51	63.83
39	64.13	0.84	5.03	1.91	36.57	0.28	15.33	0.65	63.90	74.10	13.95	75.40
42	56.47	0.94	5.59	1.81	49.68	0.35	15.75	0.76	74.76	90.28	13.85	91.33
45	55.74	1.09	6.10	1.68	63.13	0.43	16.25	0.93	87.86	108.70	13.99	109.59
48	59.69	1.24	6.52	1.58	75.55	0.49	16.66	1.09	100.65	126.35	14.20	127.14
52	49.30	1.46	7.27	1.34	87.76	0.54	16.40	1.29	112.97	143.53	13.82	144.19

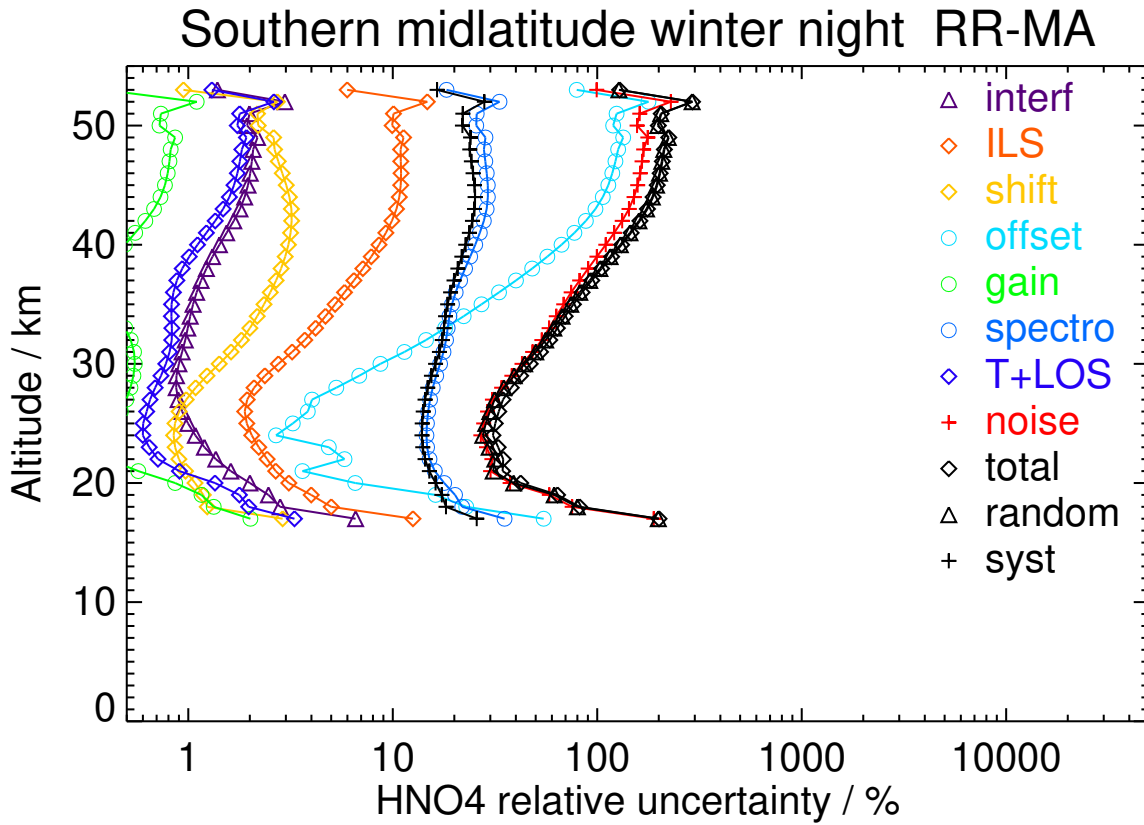


Figure S88: V8R_HNO₄_562 Southern midlatitude winter night

Table S93: HNO₄ error budget for Southern midlatitude spring day. All uncertainties are 1 σ .

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)
18	100.56	1.64	3.44	0.71	11.56	0.89	17.88	1.13	36.59	39.11	16.71	42.53
21	148.02	1.46	2.82	0.93	2.26	0.90	22.32	0.95	21.99	22.65	22.06	31.62
24	202.64	1.40	3.39	1.33	2.95	1.04	29.40	1.04	29.91	30.55	29.18	42.25
27	198.12	1.16	3.26	1.67	3.38	1.23	29.51	1.13	34.78	35.40	29.25	45.93
30	153.50	0.99	3.28	1.91	4.90	1.01	24.35	1.07	39.81	40.49	24.08	47.11
33	101.62	0.97	3.71	2.04	8.49	0.71	18.21	0.91	44.64	45.76	17.95	49.16
36	63.41	0.94	4.24	2.08	15.15	0.47	13.90	0.70	49.15	51.77	13.51	53.50
39	39.83	0.90	4.75	2.01	24.95	0.32	11.68	0.60	55.07	60.81	11.01	61.80
42	29.90	0.95	5.15	1.86	37.37	0.27	10.87	0.66	64.61	74.99	9.83	75.63
45	21.35	1.07	5.51	1.67	50.99	0.28	10.74	0.82	77.59	93.18	9.35	93.65
48	18.02	1.20	5.87	1.53	64.15	0.31	10.86	1.00	91.35	111.95	9.23	112.33
52	19.65	1.33	6.28	1.43	78.65	0.33	11.03	1.16	106.54	132.72	9.30	133.05

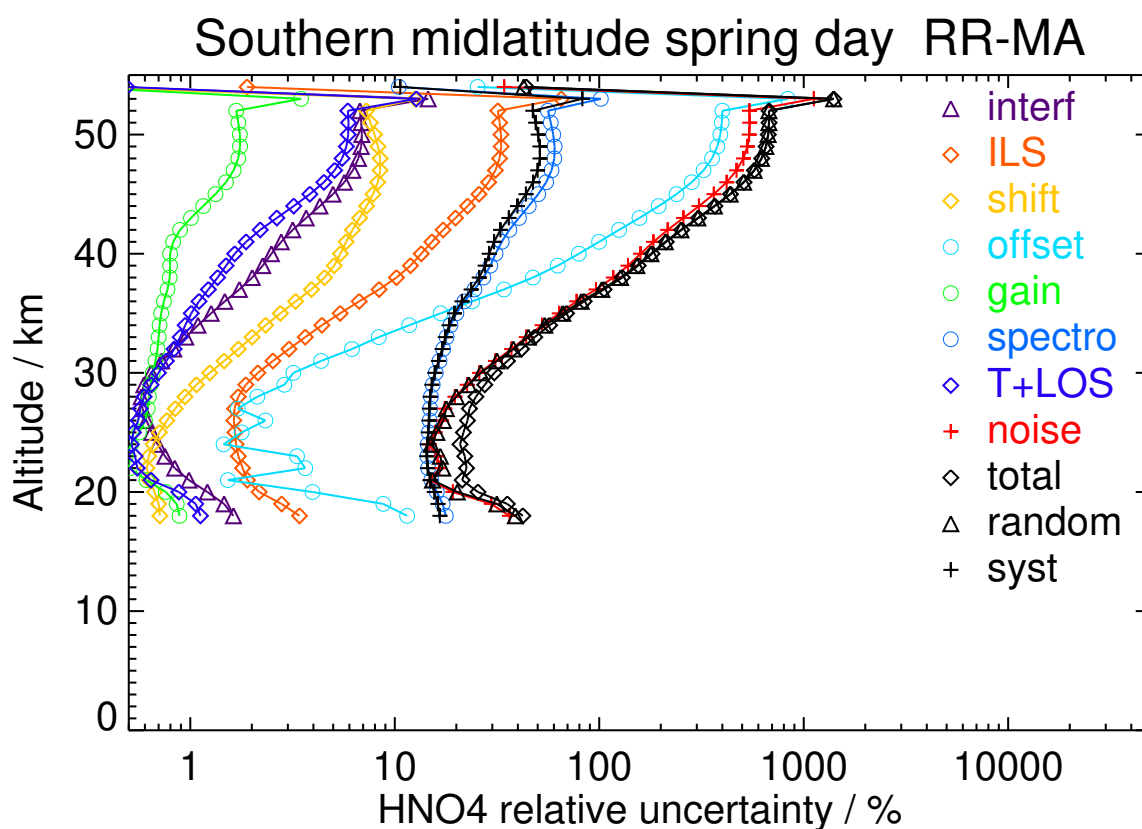


Figure S89: V8R_HNO₄.562 Southern midlatitude spring day

Table S94: HNO₄ 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)
18	93.96	1.59	3.25	0.65	10.97	0.82	16.58	1.05	34.49	36.75	15.81	40.00
21	153.82	1.46	3.09	0.93	4.09	0.72	23.49	0.89	24.02	24.90	23.22	34.05
24	213.19	1.42	3.62	1.33	2.54	1.13	31.91	1.03	30.32	31.20	31.46	44.31
27	214.47	1.18	3.31	1.67	3.18	1.37	32.61	1.14	35.12	35.95	32.13	48.22
30	174.33	1.01	3.31	1.97	4.85	1.12	27.66	1.11	39.94	40.80	27.15	49.01
33	120.59	0.99	3.78	2.16	8.40	0.82	21.26	0.96	44.58	45.83	20.76	50.31
36	75.29	0.95	4.42	2.22	14.88	0.55	16.17	0.75	48.78	51.40	15.71	53.75
39	46.16	0.91	4.97	2.15	24.53	0.36	13.19	0.63	54.70	60.31	12.70	61.63
42	34.96	0.96	5.32	1.96	36.84	0.29	12.06	0.67	64.22	74.38	11.28	75.23
45	35.73	1.08	5.64	1.76	50.47	0.32	12.05	0.83	77.16	92.55	10.79	93.18
48	38.58	1.21	5.99	1.62	63.70	0.36	12.46	0.99	91.02	111.46	10.75	111.97
52	40.17	1.34	6.41	1.54	78.28	0.40	12.94	1.15	106.28	132.36	10.87	132.80

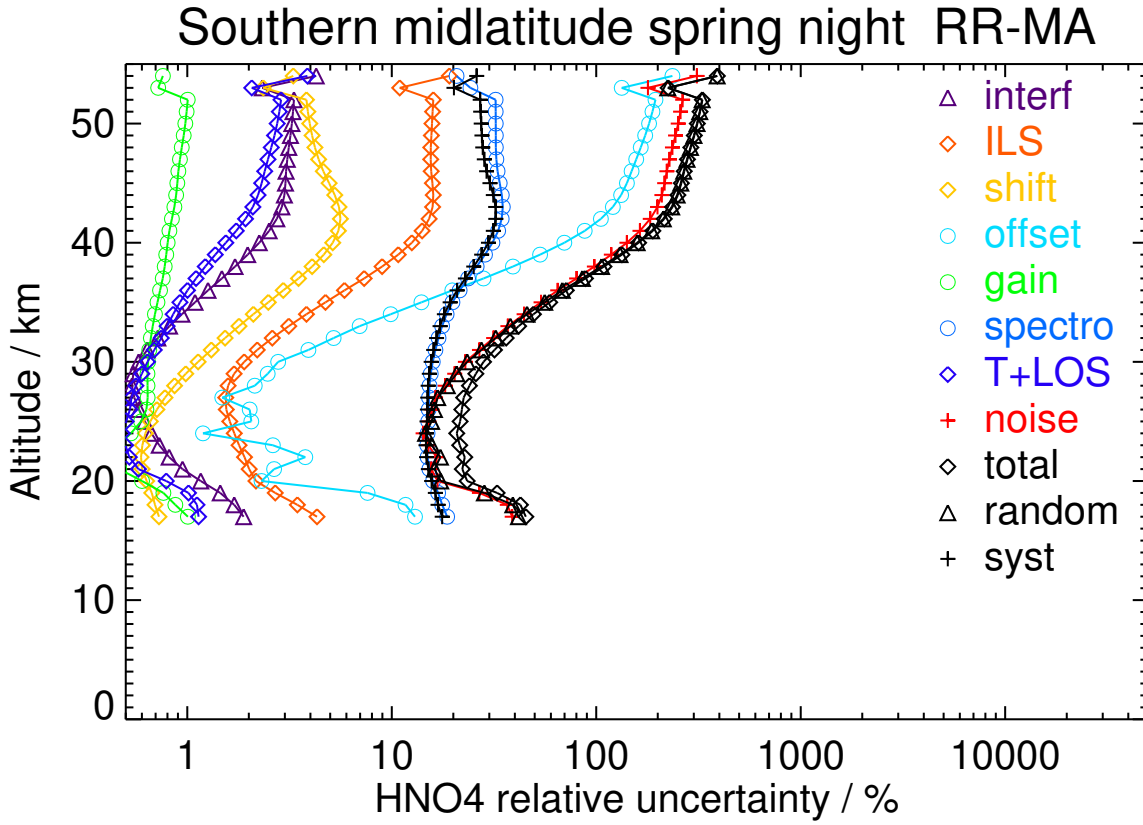


Figure S90: V8R_HNO₄_562 Southern midlatitude spring night

Table S95: HNO₄ 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)
18	54.62	1.44	2.08	0.38	8.53	0.59	10.58	0.89	27.01	28.92	9.24	30.36
21	115.51	1.47	3.01	0.73	6.97	0.54	17.84	0.76	27.50	28.70	17.67	33.70
24	184.48	1.45	3.52	1.17	4.59	0.98	26.84	0.86	30.60	31.37	26.68	41.18
27	196.70	1.20	2.95	1.57	4.05	1.15	29.19	1.01	34.48	35.25	28.79	45.52
30	158.60	1.02	2.78	1.93	4.54	0.90	24.75	1.03	38.49	39.26	24.24	46.14
33	99.65	1.01	3.33	2.13	6.54	0.64	17.74	0.88	42.51	43.37	17.36	46.72
36	52.32	0.96	4.19	2.13	10.88	0.44	12.01	0.67	46.03	47.58	11.89	49.04
39	16.78	0.90	4.87	1.93	18.63	0.31	8.98	0.56	49.91	53.53	9.01	54.29
42	2.41	0.98	5.32	1.64	29.82	0.28	8.28	0.64	56.61	64.27	8.05	64.77
45	1.40	1.14	5.76	1.36	43.41	0.33	8.76	0.84	67.94	80.92	8.08	81.33
48	5.88	1.30	6.26	1.17	57.49	0.39	9.47	1.04	82.09	100.52	8.48	100.88
52	9.25	1.44	6.88	1.08	73.82	0.44	10.17	1.22	99.33	124.05	9.04	124.38

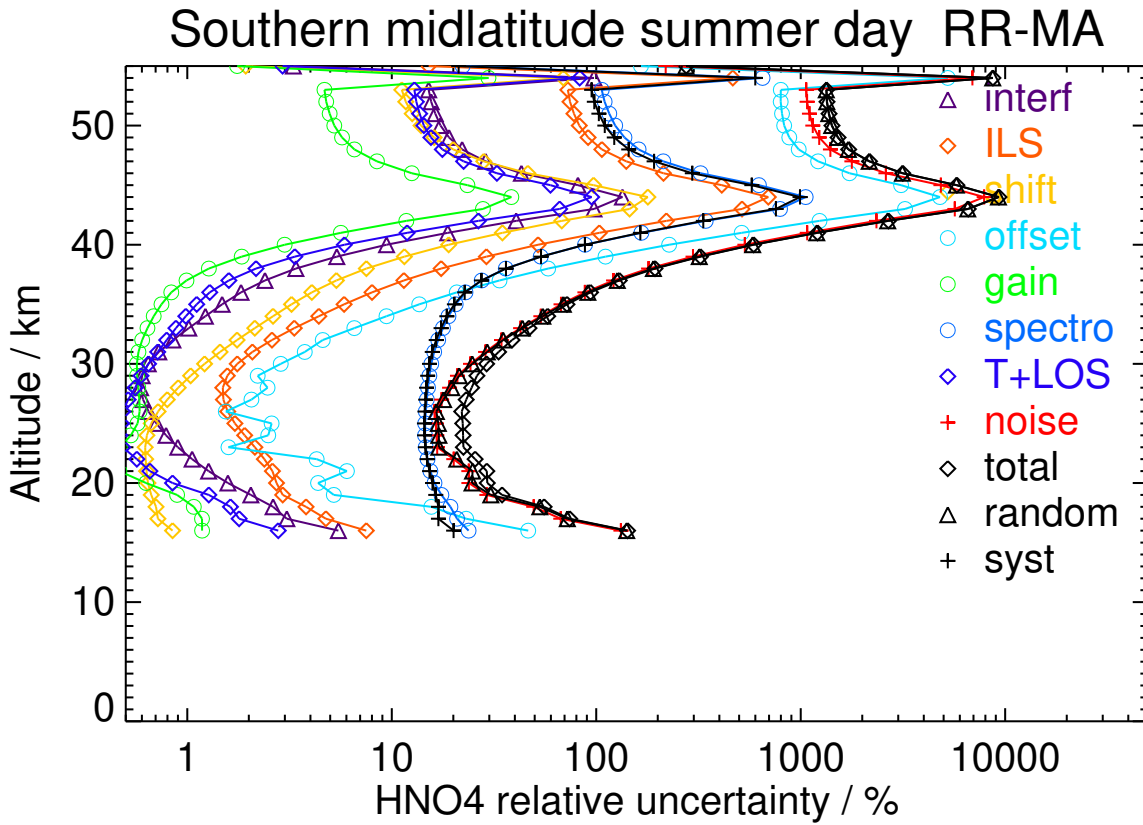


Figure S91: V8R_HNO₄_562 Southern midlatitude summer day

Table S96: HNO₄ 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)
18	62.82	1.57	2.51	0.44	10.02	0.64	11.95	0.88	30.39	32.64	10.55	34.30
21	115.02	1.51	3.07	0.76	5.79	0.54	18.40	0.75	25.69	26.67	18.27	32.33
24	189.94	1.48	3.68	1.21	3.37	0.92	27.71	0.86	29.85	30.47	27.58	41.10
27	198.86	1.21	2.91	1.60	3.51	1.17	29.91	1.02	33.90	34.60	29.57	45.51
30	158.20	1.04	2.75	1.96	4.31	0.93	25.05	1.04	38.03	38.66	24.73	45.90
33	106.62	1.03	3.31	2.19	6.16	0.66	18.15	0.88	42.09	42.88	17.85	46.44
36	61.82	0.96	4.23	2.17	9.99	0.47	12.36	0.68	45.50	46.88	12.22	48.44
39	25.56	0.90	5.00	1.91	16.91	0.32	8.68	0.58	49.06	52.14	8.90	52.89
42	1.50	0.99	5.53	1.55	27.28	0.26	7.28	0.64	54.76	61.44	7.52	61.89
45	-16.90	1.16	6.09	1.25	40.36	0.28	7.14	0.81	65.00	76.76	7.28	77.10
48	-31.55	1.33	6.73	1.07	54.44	0.33	7.30	1.00	78.72	95.95	7.56	96.25
52	-43.02	1.48	7.51	1.01	71.35	0.37	7.46	1.17	96.57	120.28	8.14	120.56
56	-28.50	1.71	8.61	0.78	80.39	0.64	9.52	1.40	106.57	133.79	9.48	134.13

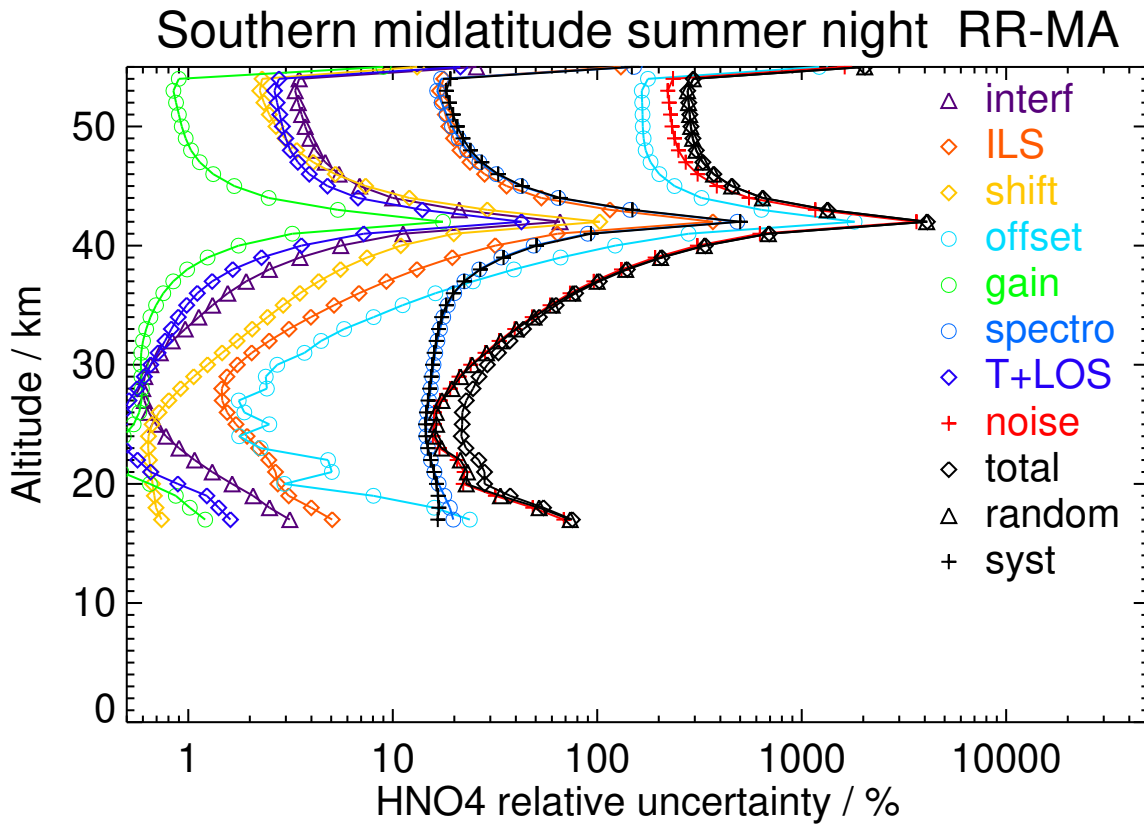


Figure S92: V8R_HNO₄_562 Southern midlatitude summer night

Table S97: HNO₄ 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)
18	46.11	1.54	2.40	0.45	12.03	0.61	9.86	0.86	37.00	39.38	8.33	40.25
21	83.00	1.43	2.45	0.69	2.55	0.41	13.68	0.72	22.94	23.48	13.32	27.00
24	146.62	1.41	3.20	1.11	2.96	0.44	21.43	0.76	31.12	31.64	21.21	38.09
27	170.55	1.17	2.95	1.43	3.73	0.81	24.81	0.91	36.22	36.93	24.30	44.21
30	138.73	0.98	2.99	1.68	6.01	0.81	22.62	0.98	41.47	42.47	21.87	47.77
33	97.49	0.94	3.54	1.89	10.67	0.62	18.38	0.85	46.01	47.71	17.60	50.86
36	71.82	0.92	4.21	2.03	18.58	0.42	14.81	0.68	50.62	54.32	14.12	56.13
39	48.80	0.90	4.83	2.07	29.68	0.29	12.50	0.59	58.02	65.50	11.94	66.58
42	26.62	0.94	5.30	2.01	43.03	0.29	11.25	0.62	69.32	81.86	10.76	82.57
45	14.21	1.03	5.66	1.91	56.95	0.37	10.69	0.72	83.28	101.13	10.18	101.64
48	10.30	1.12	5.96	1.83	69.71	0.42	10.48	0.84	96.67	119.40	9.92	119.81
52	13.03	1.23	6.37	1.71	81.76	0.42	10.75	0.98	108.83	136.35	9.86	136.71

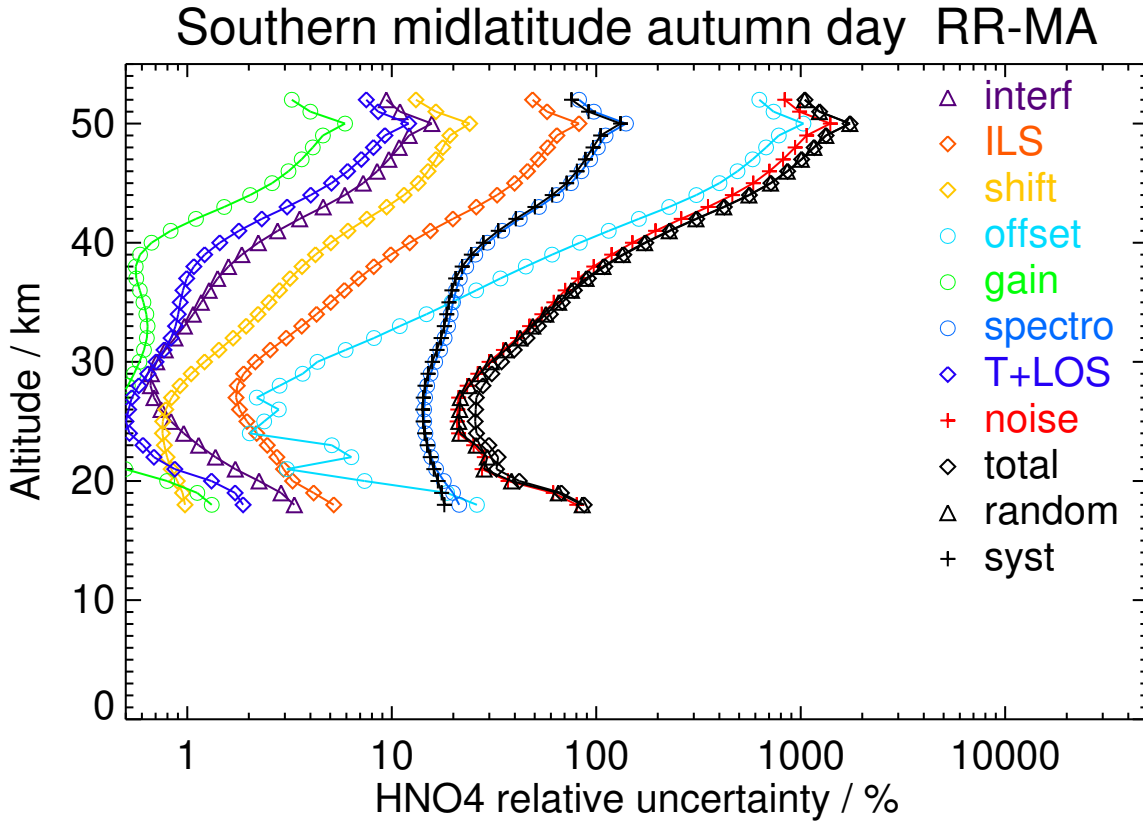


Figure S93: V8R_HNO₄_562 Southern midlatitude autumn day

Table S98: HNO₄ 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)
18	49.80	1.55	2.50	0.46	11.95	0.61	10.70	0.94	37.28	39.69	9.03	40.71
21	90.29	1.43	2.46	0.70	2.72	0.44	14.91	0.76	23.35	23.95	14.51	28.00
24	161.13	1.40	3.09	1.09	2.85	0.56	23.06	0.79	31.47	32.02	22.76	39.29
27	177.75	1.16	2.78	1.38	3.71	0.91	25.82	0.96	36.49	37.20	25.32	45.00
30	141.95	0.97	2.84	1.63	6.06	0.87	22.73	1.01	41.60	42.57	22.04	47.93
33	95.74	0.93	3.43	1.85	10.78	0.65	17.87	0.88	46.19	47.90	17.07	50.86
36	54.58	0.90	4.16	2.00	18.64	0.44	14.15	0.69	50.76	54.52	13.20	56.10
39	32.40	0.89	4.81	2.05	29.61	0.33	12.40	0.59	58.06	65.63	11.06	66.56
42	23.32	0.94	5.29	2.00	42.82	0.35	12.23	0.63	69.32	81.96	10.22	82.60
45	21.65	1.03	5.67	1.90	56.66	0.41	12.71	0.76	83.17	101.13	10.01	101.62
48	25.16	1.13	5.98	1.82	69.42	0.44	13.22	0.89	96.47	119.34	10.05	119.76
52	58.86	1.25	6.39	1.72	80.97	0.45	17.27	1.07	107.91	135.61	12.45	136.18

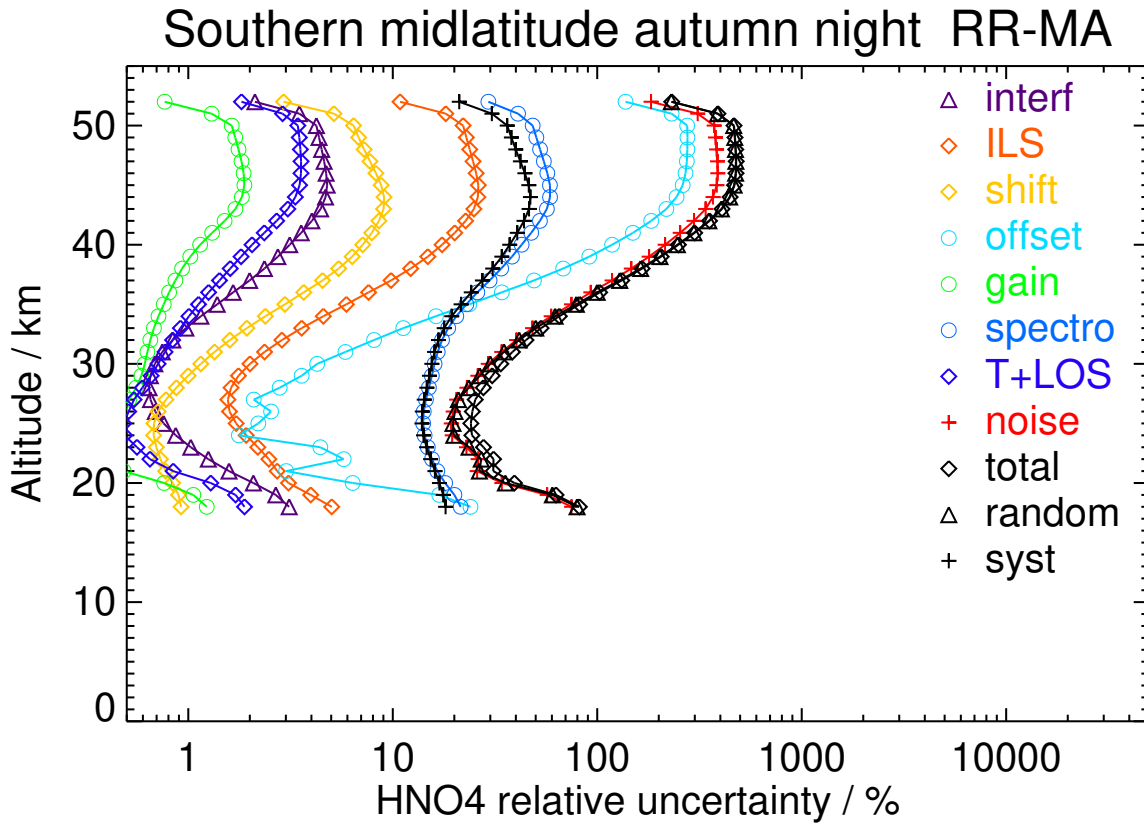


Figure S94: V8R_HNO₄.562 Southern midlatitude autumn night

Table S99: HNO4 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)
18	26.84	1.76	1.49	0.56	14.97	0.55	10.25	1.25	53.67	56.26	7.25	56.72
21	38.82	1.70	1.31	0.65	4.49	0.40	10.05	0.96	37.64	38.51	7.79	39.29
24	53.42	1.59	1.48	0.86	5.75	0.24	10.15	0.72	42.76	43.56	8.55	44.39
27	52.05	1.39	2.05	1.18	8.17	0.22	10.01	0.63	47.81	48.83	8.74	49.60
30	42.18	1.27	2.95	1.52	12.10	0.23	9.65	0.57	51.02	52.76	8.51	53.44
33	32.49	1.22	3.93	1.76	17.85	0.24	9.53	0.51	53.37	56.64	8.35	57.26
36	22.47	1.12	4.79	1.78	26.10	0.25	9.72	0.53	56.80	62.91	8.46	63.48
39	14.70	1.06	5.58	1.61	36.82	0.28	10.10	0.69	63.43	73.75	8.83	74.28
42	9.89	1.12	6.30	1.39	49.42	0.32	10.53	0.93	73.89	89.27	9.35	89.76
45	6.19	1.25	6.93	1.20	62.52	0.37	10.91	1.16	86.80	107.31	9.87	107.77
48	4.08	1.39	7.43	1.07	74.27	0.38	11.32	1.33	99.16	124.21	10.43	124.65
52	-0.13	1.54	8.02	0.97	82.93	0.41	12.32	1.43	109.27	137.54	11.00	137.98

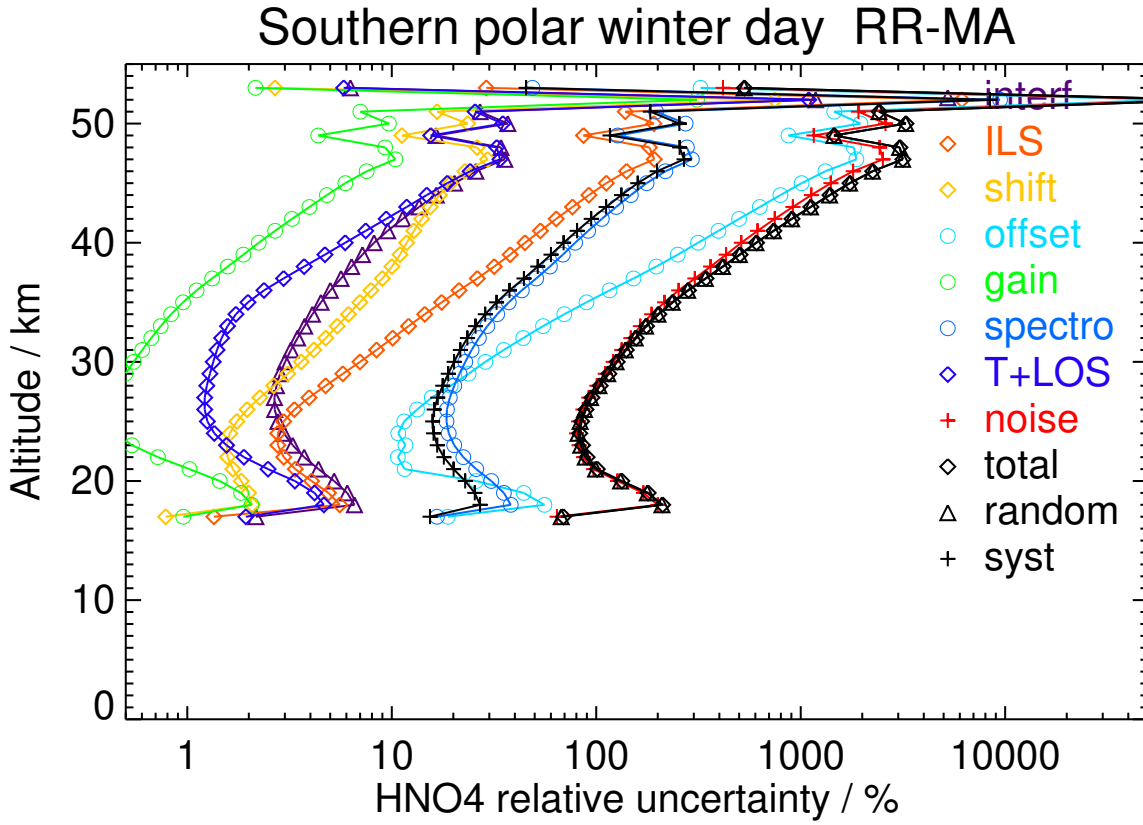


Figure S95: V8R_HNO4.562 Southern polar winter day

Table S100: HNO₄ 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)
18	26.01	1.72	1.76	0.58	15.34	0.59	9.73	1.17	55.03	57.62	6.75	58.02
21	39.92	1.64	1.39	0.66	5.79	0.50	9.86	0.97	39.04	40.09	7.33	40.76
24	51.31	1.52	1.50	0.86	5.86	0.33	10.21	0.75	41.94	42.89	8.04	43.63
27	46.66	1.34	2.23	1.16	7.89	0.27	9.68	0.63	47.10	48.13	8.14	48.82
30	41.92	1.23	3.18	1.49	11.88	0.24	9.21	0.54	50.66	52.34	8.20	52.98
33	39.03	1.19	4.14	1.73	17.49	0.21	9.01	0.50	53.39	56.48	8.39	57.09
36	36.12	1.10	5.01	1.75	25.61	0.22	8.78	0.54	56.72	62.49	8.64	63.08
39	30.59	1.04	5.82	1.59	36.24	0.29	8.64	0.69	62.89	72.80	8.97	73.35
42	25.90	1.11	6.60	1.37	48.83	0.36	8.78	0.90	72.96	88.00	9.39	88.50
45	20.67	1.25	7.30	1.19	62.07	0.42	9.12	1.11	85.70	106.02	9.85	106.48
48	14.66	1.41	7.85	1.08	74.47	0.46	9.49	1.28	98.43	123.63	10.25	124.05
52	17.70	1.57	8.35	0.99	85.53	0.42	8.64	1.44	110.54	139.91	10.41	140.30

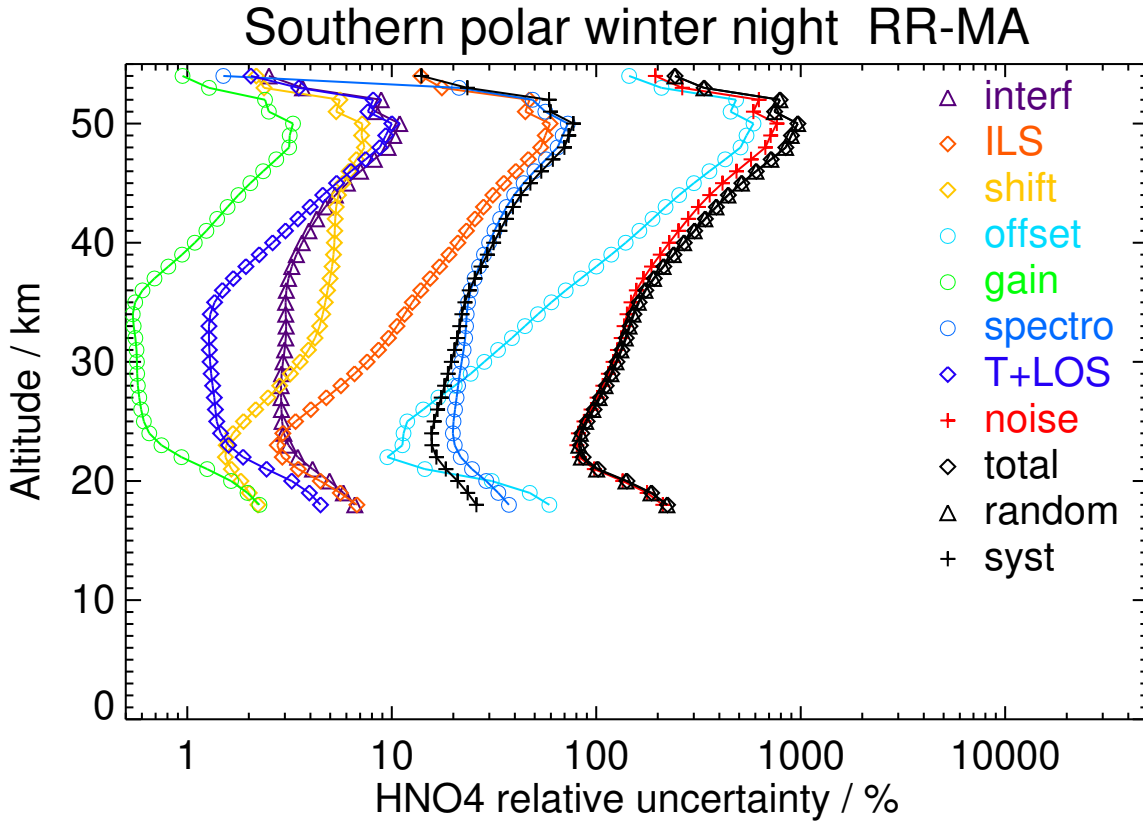


Figure S96: V8R_HNO₄_562 Southern polar winter night

Table S101: HNO₄ 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)
18	51.09	1.98	2.98	0.60	13.44	0.74	11.76	1.10	47.13	49.71	9.18	50.55
21	75.25	1.75	2.99	0.94	2.65	0.71	14.06	0.84	28.52	29.72	12.19	32.13
24	114.73	1.51	3.88	1.51	3.02	0.56	19.02	0.70	31.36	32.99	16.94	37.08
27	123.95	1.14	3.89	1.90	3.07	0.73	20.03	0.77	34.09	35.64	17.97	39.92
30	94.05	0.81	4.08	1.92	3.90	0.66	16.42	0.79	37.25	38.32	15.04	41.17
33	58.55	0.75	4.55	1.81	5.98	0.47	11.86	0.74	41.01	41.89	11.34	43.40
36	34.65	0.72	4.92	1.72	10.85	0.32	8.87	0.62	45.23	46.82	8.88	47.65
39	15.58	0.74	5.42	1.63	19.18	0.25	7.62	0.57	50.54	54.33	7.84	54.89
42	2.74	0.84	5.93	1.51	30.86	0.25	7.46	0.66	59.14	66.98	7.65	67.41
45	-2.26	0.99	6.45	1.39	44.43	0.28	7.72	0.83	71.94	84.81	7.87	85.17
48	-6.18	1.14	6.98	1.33	57.99	0.32	8.02	1.01	86.37	104.27	8.25	104.59
52	-10.33	1.29	7.58	1.35	73.27	0.36	8.27	1.18	102.95	126.58	8.74	126.88

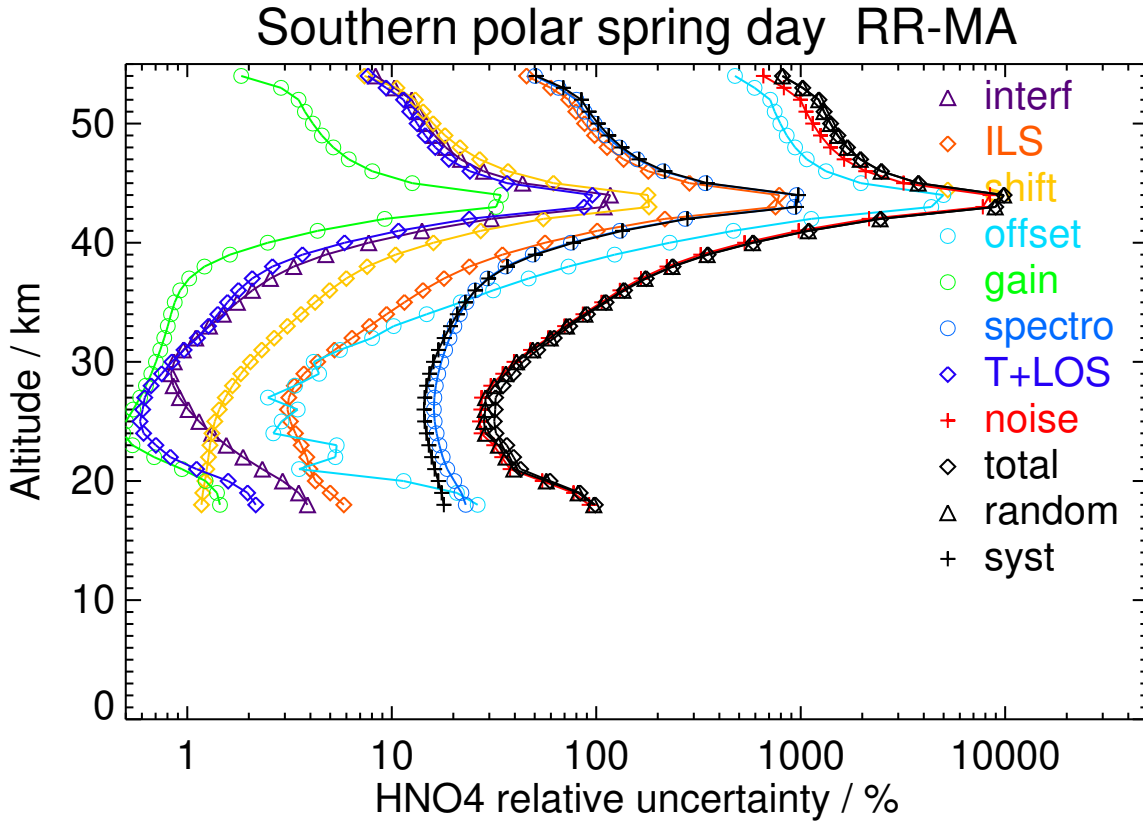


Figure S97: V8R_HNO₄_562 Southern polar spring day

Table S102: HNO₄ 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)
18	81.47	1.84	2.97	0.64	12.73	1.01	15.57	1.22	43.87	46.58	13.21	48.42
21	97.68	1.64	3.10	0.95	2.96	0.75	17.48	0.93	27.10	28.60	15.66	32.61
24	134.21	1.46	4.11	1.49	2.70	0.62	21.94	0.79	30.88	32.61	20.02	38.27
27	143.06	1.13	3.97	1.90	3.04	0.83	22.74	0.83	33.97	35.65	20.77	41.26
30	103.44	0.85	3.96	2.09	4.07	0.70	18.03	0.86	37.80	38.90	16.70	42.33
33	51.53	0.73	4.42	2.07	6.56	0.46	12.34	0.75	41.95	42.92	11.75	44.50
36	16.74	0.70	5.02	1.96	11.79	0.29	8.82	0.59	45.85	47.65	8.84	48.47
39	2.96	0.74	5.63	1.83	20.46	0.22	7.62	0.54	51.24	55.44	8.02	56.01
42	4.72	0.85	6.15	1.67	32.29	0.25	7.82	0.63	60.17	68.55	8.18	69.04
45	10.45	1.00	6.63	1.53	45.81	0.30	8.47	0.79	73.22	86.63	8.63	87.06
48	11.69	1.14	7.11	1.45	59.17	0.34	9.02	0.96	87.66	106.01	9.09	106.40
52	5.78	1.27	7.65	1.44	74.06	0.38	9.42	1.11	103.81	127.76	9.58	128.12

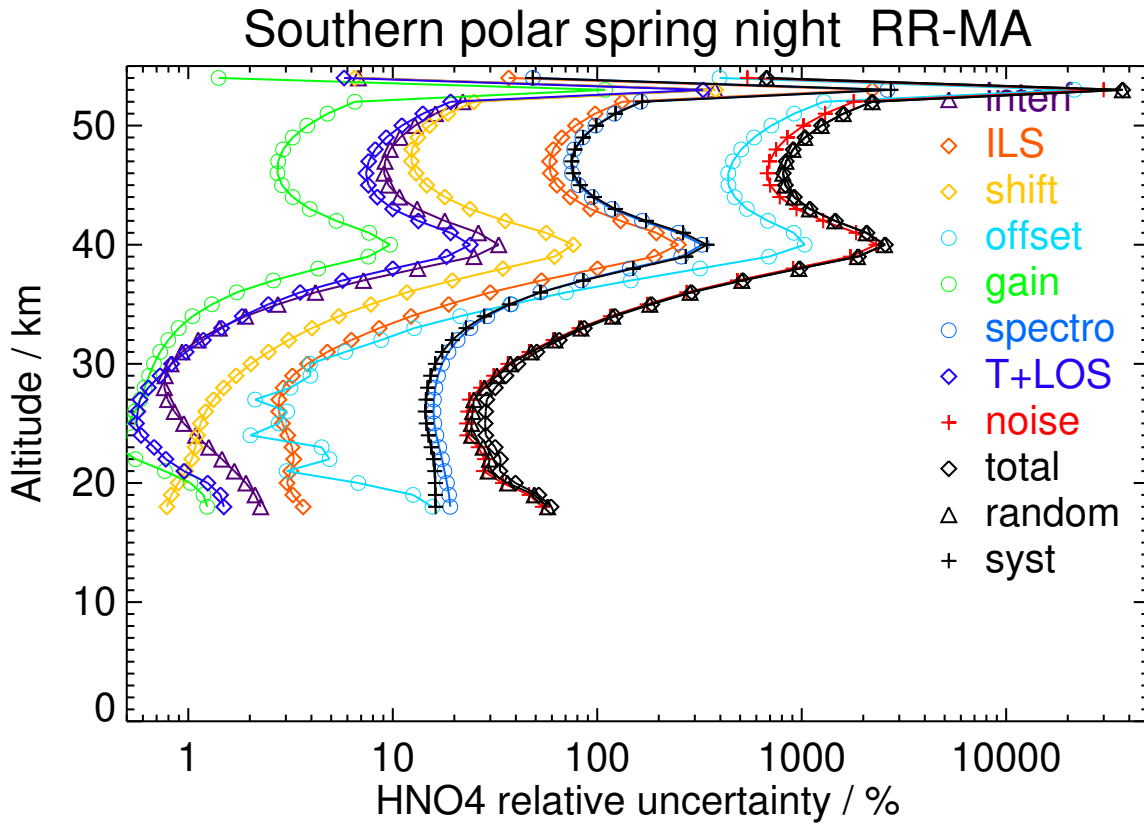


Figure S98: V8R_HNO₄_562 Southern polar spring night

Table S103: HNO₄ 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)
18	109.28	1.87	3.86	0.72	10.50	0.79	18.44	1.02	31.32	33.68	17.83	38.10
21	141.14	1.51	3.01	0.94	3.13	1.09	21.30	1.01	20.07	20.97	21.00	29.67
24	153.65	1.38	3.33	1.21	2.94	1.12	23.66	1.03	26.77	27.69	23.12	36.08
27	117.55	1.15	2.80	1.38	3.23	0.95	19.33	0.94	31.51	32.16	18.86	37.28
30	82.96	0.90	3.03	1.63	3.78	0.58	13.95	0.75	35.91	36.41	13.64	38.88
33	56.01	0.74	3.58	1.83	5.03	0.43	10.15	0.62	40.21	40.80	9.88	41.98
36	35.98	0.63	4.13	1.80	7.82	0.36	7.68	0.52	44.02	44.94	7.71	45.60
39	16.28	0.66	4.74	1.56	12.99	0.29	6.43	0.55	47.50	49.44	6.93	49.92
42	6.45	0.85	5.26	1.22	21.40	0.31	6.52	0.73	51.59	56.06	7.05	56.50
45	15.55	1.10	5.85	0.91	32.83	0.44	7.60	1.00	58.98	67.76	7.76	68.20
48	24.01	1.35	6.61	0.68	46.17	0.62	8.98	1.26	70.56	84.63	8.76	85.08
52	28.62	1.65	7.68	0.50	63.84	0.79	10.44	1.53	88.88	109.77	10.03	110.22
56	37.12	1.89	8.73	0.47	76.47	0.93	11.77	1.69	103.20	128.80	11.36	129.30
60	41.64	2.10	9.64	0.57	84.57	0.98	11.57	1.75	113.24	141.67	11.88	142.16
64	58.44	2.31	10.80	0.81	93.40	1.03	12.60	1.79	126.09	157.24	13.47	157.82

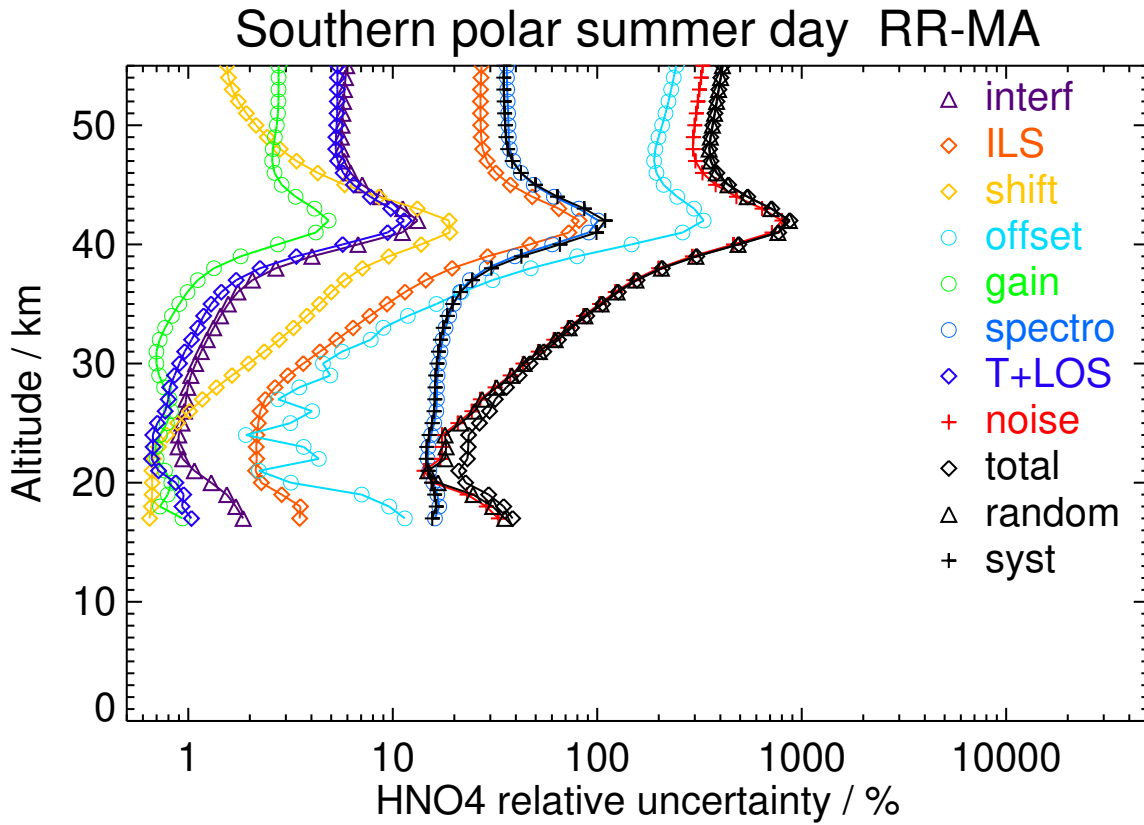


Figure S99: V8R_HNO₄_562 Southern polar summer day

Table S104: HNO₄ error budget for Southern polar summer night. All uncertainties are 1 σ .

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)
18	97.68	1.71	3.06	0.63	10.83	0.84	16.37	1.01	34.18	36.33	15.74	39.60
21	126.60	1.51	2.65	0.85	3.02	0.87	19.37	0.95	22.11	22.78	19.13	29.74
24	149.28	1.43	3.13	1.15	3.38	0.91	22.74	0.95	29.52	30.31	22.28	37.61
27	132.54	1.18	2.98	1.39	3.40	0.90	21.37	0.88	34.01	34.73	20.80	40.49
30	110.82	0.94	3.18	1.65	4.42	0.69	17.87	0.80	38.61	39.39	17.12	42.95
33	79.18	0.84	3.66	1.88	6.73	0.54	13.90	0.71	43.01	43.99	13.11	45.90
36	42.43	0.75	4.25	1.95	11.47	0.41	10.56	0.58	46.78	48.51	10.04	49.54
39	20.14	0.73	4.86	1.82	19.41	0.29	8.55	0.53	50.87	54.70	8.54	55.36
42	14.19	0.86	5.37	1.55	30.67	0.23	7.85	0.65	57.59	65.45	8.22	65.96
45	11.31	1.08	5.89	1.28	44.22	0.24	7.95	0.86	68.74	81.92	8.48	82.35
48	13.36	1.28	6.45	1.08	58.29	0.29	8.34	1.07	82.59	101.26	8.96	101.65
52	21.35	1.46	7.12	0.98	74.83	0.34	8.79	1.27	99.83	124.93	9.57	125.30

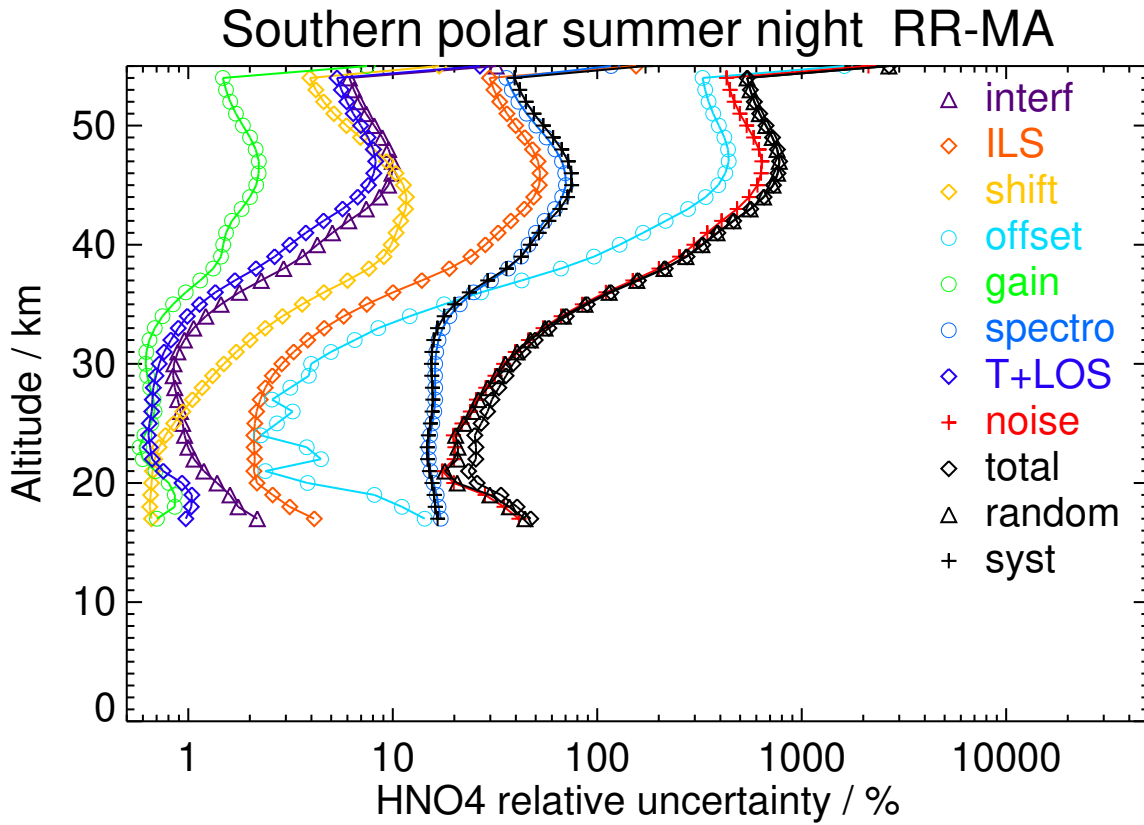


Figure S100: V8R_HNO₄_562 Southern polar summer night

Table S105: HNO₄ 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)
18	46.11	1.86	2.71	0.69	12.66	0.77	10.51	0.99	39.69	42.28	8.47	43.12
21	63.34	1.67	2.10	0.81	1.90	0.49	10.89	0.79	24.13	24.74	10.05	26.70
24	85.19	1.50	2.34	0.96	4.23	0.30	13.17	0.72	34.74	35.40	12.42	37.51
27	81.59	1.28	2.35	1.07	5.72	0.40	13.50	0.76	40.54	41.34	12.58	43.21
30	61.03	1.20	2.63	1.19	10.69	0.33	12.37	0.71	46.42	48.04	11.19	49.32
33	37.61	1.19	3.12	1.35	19.20	0.25	11.14	0.62	52.48	56.27	9.71	57.10
36	17.33	1.15	3.63	1.50	30.66	0.24	10.29	0.56	60.13	67.84	8.72	68.40
39	3.82	1.08	4.12	1.59	44.06	0.32	9.91	0.60	70.73	83.64	8.25	84.05
42	-7.11	1.06	4.55	1.62	58.13	0.44	9.86	0.72	83.54	102.05	8.14	102.38
45	-16.12	1.10	4.89	1.59	71.62	0.55	9.95	0.87	96.80	120.67	8.17	120.95
48	-22.50	1.16	5.15	1.54	83.48	0.62	10.05	1.02	108.57	137.19	8.23	137.44

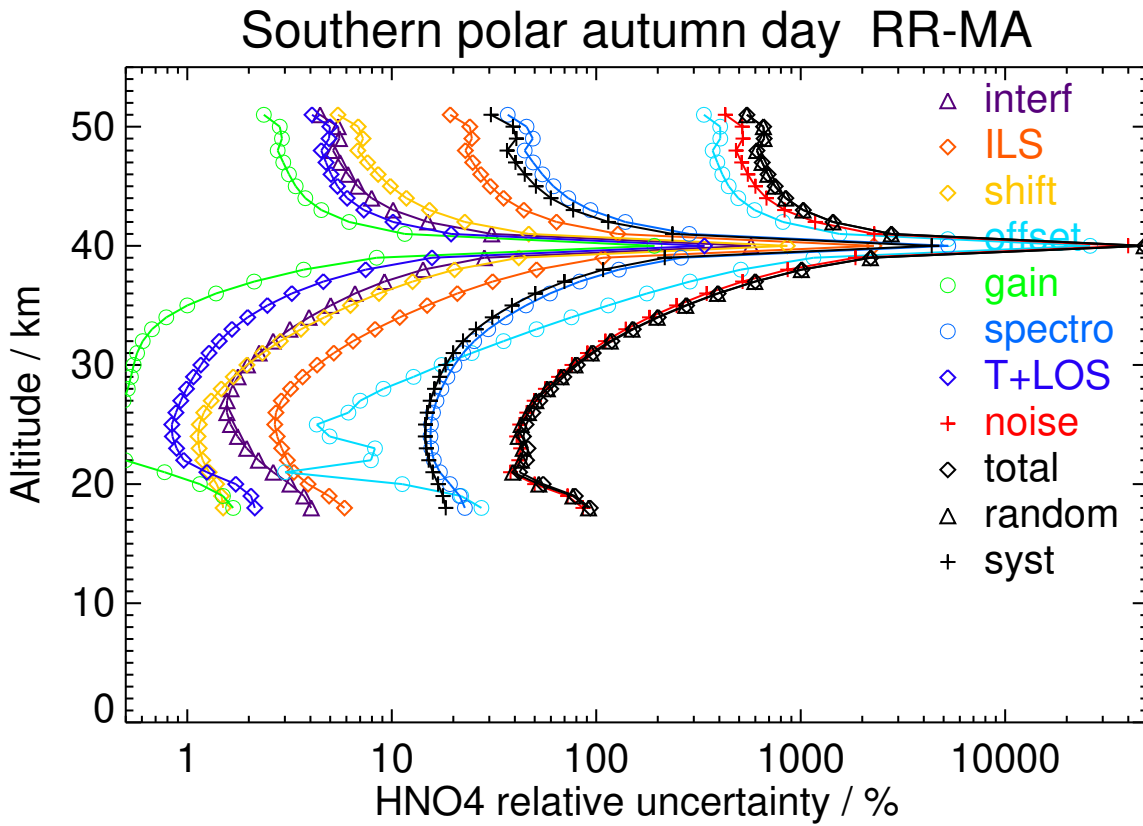


Figure S101: V8R_HNO₄_562 Southern polar autumn day

Table S106: HNO₄ 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)
18	50.10	1.78	2.38	0.66	12.91	0.69	10.09	0.99	40.84	43.35	8.25	44.12
21	59.35	1.62	1.80	0.74	2.15	0.48	9.98	0.83	25.35	25.95	8.98	27.46
24	63.91	1.49	1.99	0.86	4.37	0.30	11.14	0.73	35.64	36.41	9.75	37.69
27	53.03	1.27	2.14	0.96	6.13	0.32	11.07	0.64	41.59	42.54	9.39	43.57
30	49.43	1.16	2.64	1.10	11.80	0.29	10.49	0.57	47.62	49.45	9.05	50.27
33	51.57	1.14	3.19	1.26	20.77	0.25	10.21	0.54	53.82	57.99	9.07	58.70
36	49.42	1.09	3.71	1.41	32.51	0.25	10.35	0.54	61.72	70.03	9.25	70.64
39	42.35	1.05	4.21	1.50	46.05	0.31	10.77	0.61	72.41	86.09	9.50	86.61
42	34.46	1.05	4.67	1.52	60.16	0.41	11.30	0.74	85.19	104.57	9.78	105.02
45	27.47	1.10	5.08	1.50	73.60	0.50	11.77	0.89	98.28	123.06	10.02	123.47
48	21.63	1.17	5.40	1.46	85.38	0.57	12.11	1.03	109.80	139.36	10.21	139.74

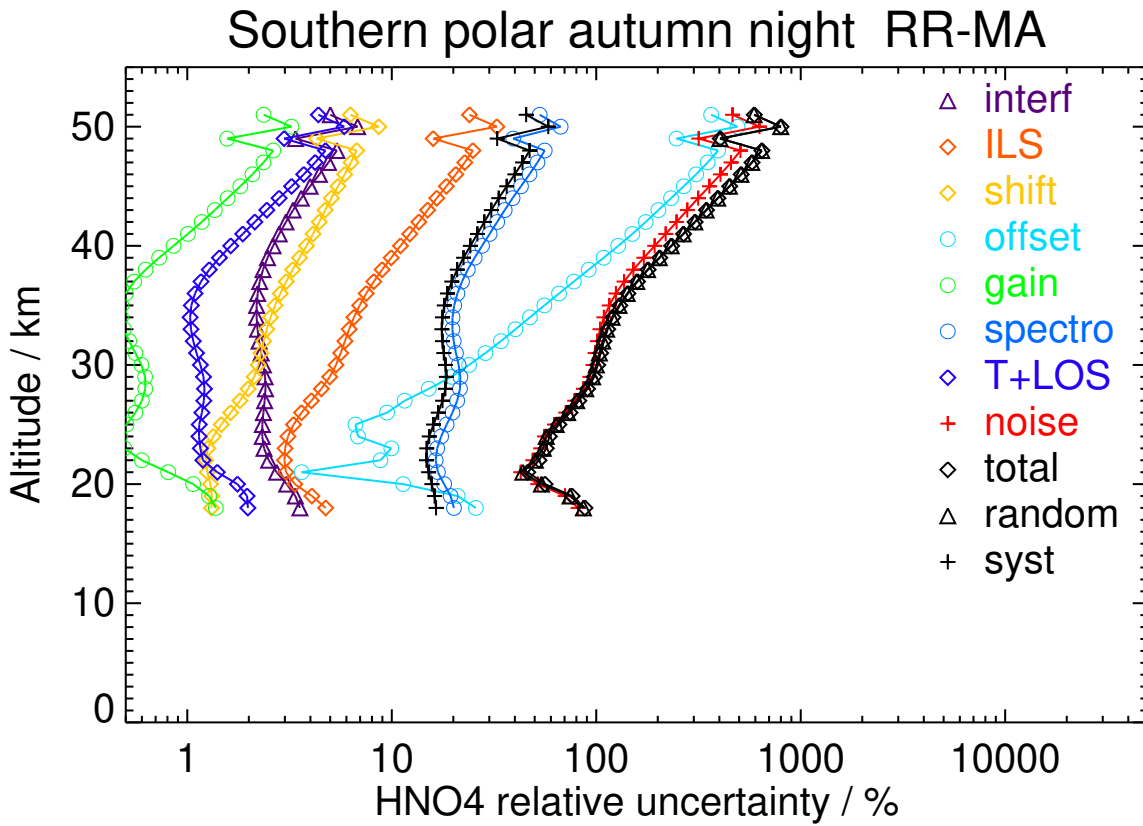


Figure S102: V8R_HNO₄_562 Southern polar autumn night

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