

Supplement to
Version 8 of IMK/IAA MIPAS reactive nitrogen reservoir gases:
Error estimates for HNO₃

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July 28, 2026

In this document we present:

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

The errors are presented as 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 nitric 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_3 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 HNO_3 (FR NOM)

Type of Uncertainty	Value / typical value ¹	Source ²	Propagation Method ³
noise (A band)	30 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
noise (B band)	16 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
offset (A band)	6 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
offset (B band)	2.5 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
gain random (A and B band)	0.21%	Kleinert et al. (2018)	P(21;22)
gain systematic (A band)	1.15%	Kleinert et al. (2018)	P(21;22)
gain systematic (B band)	1.03%	Kleinert et al. (2018)	P(21;22)
spectral shift	0.00029 cm ⁻¹	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
ILS	3%	Hase (2000, 2003)	P(7;14;15)
Temp., noise	0.24 - 1.04 K	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Tang. alt., noise	35 - 79 m	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Temp., spectral shift	0.01 - 0.71 K	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Tang. alt., spectral shift	2 - 41 m	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Temp., offset	0.05 - 0.39 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., offset	8 - 24 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., ILS	0.03 - 1.26 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., ILS	7 - 122 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., CO ₂ intensities	0.03 - 0.16 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Tang. alt., CO ₂ intensities	24 - 35 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Temp., CO ₂ broadening	0.09 - 1.10 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Tang. alt., CO ₂ broadening	189 - 298 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Temp., gain, syst.	0.30 - 0.79 K	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Tang. alt., gain, syst.	2 - 51 m	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Temp., 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(C ₂ H ₂)	2.98E-06 - 1.01E-05 ppmv	V5 retrieval (Glatthor et al., 2007)	G(6)
vmr(C ₂ H ₆)	2.85E-07 - 8.69E-05 ppmv	V5 retrieval (Glatthor et al., 2009)	G(6)
vmr(CH ₄)	7.24E-03 - 8.18E-02 ppmv	V5 retrieval (Pleninger et al., 2015)	G(6)
vmr(CO ₂)	7.56E-01 - 7.51E+00 ppmv	WACCM model calc. (Kiefer et al., 2021)	P(20)
vmr(CIO)	1.55E-05 - 5.52E-04 ppmv	V5 retrieval (von Clarmann et al., 2013)	G(6)
vmr(HCN)	1.50E-05 - 4.40E-05 ppmv	V5 retrieval (Glatthor et al., 2009)	G(6)
vmr(H ₂ O ₂)	3.03E-06 - 1.12E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(H ₂ O)	1.60E-01 - 2.54E+00 ppmv	preceding V8 retrieval (Kiefer et al., 2026)	G(6)
vmrHOCl	2.12E-06 - 7.27E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(O ₃)	2.43E-02 - 1.10E-01 ppmv	V5 retrieval (Glatthor et al., 2006)	G(6)
vmr(N ₂ O)	2.74E-04 - 1.11E-02 ppmv	V5 retrieval (Pleninger et al., 2015)	G(6)
vmr(SO ₂)	5.84E-05 - 3.99E-04 ppmv	V5 retrieval (Höpfner et al., 2015)	G(6)
vmr(NH ₃)	7.18E-12 - 3.75E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(NO ₂)	7.78E-08 - 3.78E-04 ppmv	V5 retrieval (Funke et al., 2005)	G(6)
vmr(OCS)	3.85E-05 - 2.11E-04 ppmv	V5 retrieval (Glatthor et al., 2017)	G(6)
vmr(CFC-11)	2.68E-08 - 5.77E-06 ppmv	V5 retrieval (Kellmann et al., 2012)	G(6)
vmr(CFC-12)	8.59E-06 - 1.60E-04 ppmv	V5 retrieval (Kellmann et al., 2012)	G(6)
vmr(HCFC-22)	4.51E-06 - 1.43E-05 ppmv	V5 retrieval (Chirkov et al., 2016)	G(6)
vmr(ClONO ₂)	7.29E-06 - 1.02E-04 ppmv	V5 retrieval (von Clarmann et al., 2013)	G(6)
line intensities	25%	Flaud et al. (2015); Rothman et al. (2009)	P(7)
broadening coeff.	7.5%	Flaud et al. (2015); Rothman et al. (2009)	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 HNO_3 (RR NOM)

Type of Uncertainty	Value / typical value ¹	Source ²	Propagation Method ³
noise (A band)	20 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
noise (B band)	10 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
offset (A band)	3 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
offset (B band)	1.5 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
gain random (A and B band)	0.21%	Kleinert et al. (2018)	P(21;22)
gain systematic (A band)	1.15%	Kleinert et al. (2018)	P(21;22)
gain systematic (B band)	1.03%	Kleinert et al. (2018)	P(21;23)
spectral shift	0.00029 cm ⁻¹	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
ILS	3%	Hase (2000, 2003)	P(7;14;15)
Temp., noise	0.22 - 1.23 K	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Tang. alt., noise	29 - 52 m	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Temp. spectral shift	0.01 - 0.10 K	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Tang. alt., spectral shift	1 - 15 m	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Temp., offset	0.03 - 0.45 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., offset	8 - 16 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., ILS	0.05 - 1.16 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., ILS	8 - 113 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., CO ₂ intensities	0.03 - 0.18 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Tang. alt., CO ₂ intensities	26 - 34 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Temp., CO ₂ broadening	0.14 - 1.47 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Tang. alt., CO ₂ broadening	198 - 252 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Temp., gain, syst.	0.22 - 0.81 K	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Tang. alt., gain, syst.	1 - 49 m	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Temp., gain, random	0.04 - 0.15 K	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Tang. alt., gain, random	0.2 - 9 m	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
vmr(C ₂ H ₂)	3.22E-06 - 9.55E-06 ppmv	V5 retrieval (Wiegele et al., 2012)	G(6)
vmr(C ₂ H ₆)	2.77E-07 - 7.56E-05 ppmv	V5 retrieval (Wiegele et al., 2012)	G(6)
vmr(CH ₄)	1.03E-02 - 1.44E-01 ppmv	V5 retrieval (Pleninger et al., 2015)	G(6)
vmr(CO ₂)	7.56E-01 - 7.51E+00 ppmv	WACCM model calc. (Kiefer et al., 2021)	P(20)
vmr(CIO)	1.50E-05 - 6.60E-04 ppmv	V5 retrieval (von Clarmann et al., 2013)	G(6)
vmr(HCN)	1.54E-05 - 4.41E-05 ppmv	V5 retrieval (Wiegele et al., 2012)	G(6)
vmr(H ₂ O ₂)	3.03E-06 - 1.12E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(H ₂ O)	1.87E-01 - 2.24E-00 ppmv	preceding V8 retrieval (Kiefer et al., 2026)	G(6)
vmr(HOCl)	2.12E-06 - 7.27E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(O ₃)	2.48E-02 - 8.52E-02 ppmv	preceding V8 retrieval (Kiefer et al., 2023)	G(6)
vmr(N ₂ O)	3.14E-04 - 1.59E-02 ppmv	V5 retrieval (Pleninger et al., 2015)	G(6)
vmr(SO ₂)	5.95E-05 - 4.24E-04 ppmv	V5 retrieval (Höpfner et al., 2015)	G(6)
vmr(NH ₃)	7.18E-12 - 3.75E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(NO ₂)	7.49E-08 - 3.77E-04 ppmv	V5 retrieval (Funke et al., 2005)	G(6)
vmr(OCS)	3.37E-05 - 2.14E-04 ppmv	V5 retrieval (Glatthor et al., 2017)	G(6)
vmr(CFC-11)	2.64E-08 - 5.94E-06 ppmv	V5 retrieval (Kellmann et al., 2012)	G(6)
vmr(CFC-12)	1.09E-05 - 1.57E-04 ppmv	V5 retrieval (Kellmann et al., 2012)	G(6)
vmr(HCFC-22)	4.78E-06 - 1.46E-05 ppmv	V5 retrieval (Chirkov et al., 2016)	G(6)
vmr(ClONO ₂)	7.38E-06 - 1.04E-04 ppmv	V5 retrieval (von Clarmann et al., 2013)	G(6)
line intensities	25%	Flaud et al. (2015); Rothman et al. (2009)	P(7)
broadening coeff.	7.5%	Flaud et al. (2015); Rothman et al. (2009)	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_3 (RR MA).

Type of Uncertainty	Value / typical value ¹	Source ²	Propagation Method ³
noise (A band)	20 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
noise (B band)	10 nW/(cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(16)
offset (A band)	3 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
offset (B band)	1.5 nW/ (cm ² sr cm ⁻¹)	Kleinert et al. (2018)	G(5;13)
gain random (A and B band)	0.21%	Kleinert et al. (2018)	P(21;22)
gain systematic (A band)	1.15%	Kleinert et al. (2018)	P(21;22)
gain systematic (B band)	1.03%	Kleinert et al. (2018)	P(21;23)
spectral shift	0.00029 cm ⁻¹	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
ILS	3%	Hase (2000, 2003)	P(7;14;15)
Temp., noise	0.22 - 2.24 K	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Tang. alt., noise	27 - 47 m	preceding V8 retrieval (Kiefer et al., 2021)	G(6)
Temp., spectral shift	0.004 - 0.11 K	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Tang. alt., spectral shift	0.4 - 14 m	preceding V8 retrieval (Kiefer et al., 2021)	P(17)
Temp., offset	0.05 - 0.72 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., offset	1 - 16 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., ILS	0.08 - 0.78 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Tang. alt., ILS	0.5 - 83 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7)
Temp., CO ₂ intensities	0.02 - 0.12 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Tang. alt., CO ₂ intensities	20 - 35 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;26;27)
Temp., CO ₂ broadening	0.08 - 1.17 K	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Tang. alt., CO ₂ broadening	14 - 242 m	preceding V8 retrieval (Kiefer et al., 2021)	P(7;28;29)
Temp., gain, syst.	0.26 - 0.48 K	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Tang. alt., gain, syst.	0.3 - 32 m	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Temp., gain, random	0.05 - 0.09 K	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
Tang. alt., gain, random	0.06 - 6 m	preceding V8 retrieval (Kiefer et al., 2021)	P(21)
vmr(C ₂ H ₂)	3.22E-06 - 8.18E-06 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(C ₂ H ₆)	2.77E-07 - 7.56E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CH ₄)	7.55E-03 - 6.83E-02 ppmv	V5 retrieval (Plieninger et al., 2015)	G(6)
vmr(CO ₂)	7.56E-01 - 7.51E+00 ppmv	WACCM model calc. (Kiefer et al., 2021)	P(20)
vmr(CIO)	1.11E-05 - 1.73E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(HCN)	1.54E-05 - 4.41E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(H ₂ O ₂)	3.03E-06 - 5.01E-05 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)
vmrHOCl	2.12E-06 - 7.11E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(O ₃)	2.97E-02 - 9.09E-02 ppmv	preceding V8 retrieval (López-Puertas et al., 2023)	G(6)
vmr(N ₂ O)	2.95E-04 - 8.48E-03 ppmv	V5 retrieval (Plieninger et al., 2015)	G(6)
vmr(SO ₂)	1.28E-05 - 5.92E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(NH ₃)	7.18E-12 - 1.57E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(NO ₂)	3.50E-07 - 3.65E-04 ppmv	V5 retrieval (Funke et al., 2005)	G(6)
vmr(OCS)	7.29E-09 - 3.09E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CFC-11)	9.68E-12 - 2.57E-05 ppmv	database (Kiefer et al., 2002)	P(7;11)
vmr(CFC-12)	3.06E-06 - 8.60E-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)
vmr(ClONO ₂)	2.68E-08 - 7.21E-04 ppmv	database (Kiefer et al., 2002)	P(7;11)
line intensities	25%	Flaud et al. (2015); Rothman et al. (2009)	P(7)
broadening coeff.	7.5%	Flaud et al. (2015); Rothman et al. (2009)	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: HNO₃ error budget for Northern polar winter day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	-0.05	21.96	> 100	28.43	> 100	52.04	> 100	> 100	> 100	> 100	> 100	> 100
8	0.47	4.21	15.81	1.67	9.45	4.60	65.08	8.65	21.79	60.71	38.48	71.87
11	1.78	0.61	4.71	0.36	1.85	1.05	25.59	3.35	4.65	14.08	22.73	26.74
14	5.10	0.12	3.55	0.30	0.58	0.83	21.79	1.63	1.62	8.14	20.67	22.22
17	7.91	0.08	1.16	0.19	0.44	1.15	21.52	1.13	1.17	6.41	20.68	21.65
20	9.98	0.03	0.92	0.18	0.36	0.85	21.92	0.81	1.01	4.29	21.58	22.00
23	10.62	0.01	0.90	0.13	0.24	0.93	22.61	0.86	0.99	3.47	22.42	22.69
26	8.74	< 0.01	1.21	0.14	0.22	1.06	24.67	1.12	1.23	5.61	24.14	24.78
29	7.04	0.01	1.58	0.09	0.33	1.05	25.44	1.30	1.69	7.13	24.59	25.60
32	3.65	0.02	2.58	0.19	0.73	1.17	29.12	2.14	3.75	10.71	27.58	29.58
35	1.49	0.07	3.24	0.58	1.55	1.25	30.82	2.78	10.78	17.59	27.91	32.99
38	0.65	0.19	2.95	0.67	4.69	1.22	28.70	2.57	29.09	32.54	25.50	41.35
41	0.35	0.49	2.94	0.48	15.13	0.99	28.66	2.21	61.24	65.77	22.15	69.40

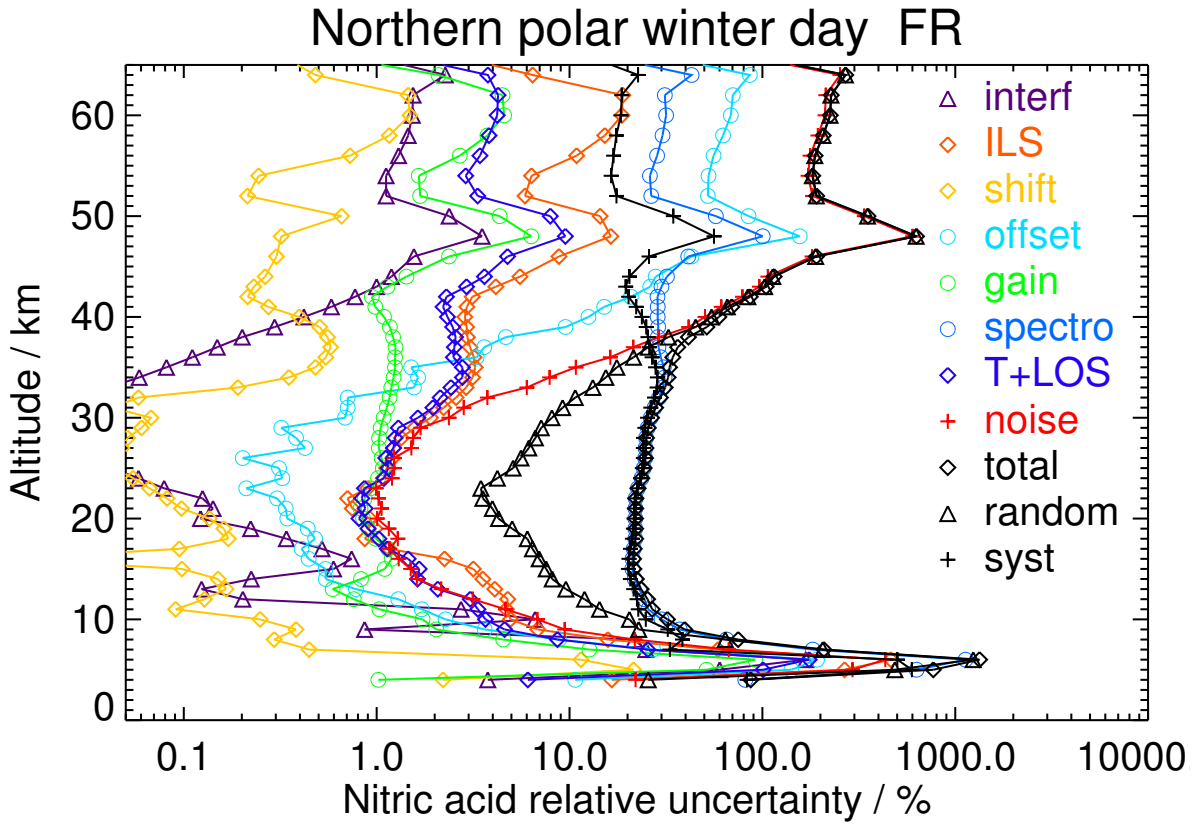


Figure S1: V8H.HNO₃.61 Northern polar winter day

Table S6: HNO₃ error budget for Northern polar winter night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	-0.08	16.06	> 100	18.23	93.67	47.42	> 100	80.68	> 100	> 100	> 100	> 100
8	0.58	2.49	18.29	1.50	8.42	4.36	57.38	8.63	19.12	36.79	53.02	64.54
11	1.63	0.51	8.68	0.38	2.37	1.63	28.31	4.18	5.16	17.39	25.04	30.49
14	5.86	0.12	3.80	0.23	0.56	0.77	23.80	1.81	1.47	8.51	22.69	24.24
17	10.08	0.05	1.36	0.15	0.42	1.38	21.62	1.39	1.03	5.93	20.96	21.78
20	10.00	0.02	1.56	0.24	0.34	1.07	23.20	1.09	1.11	4.44	22.91	23.33
23	10.65	0.01	0.82	0.18	0.26	0.89	22.65	0.90	1.03	3.33	22.48	22.72
26	8.57	0.01	1.65	0.16	0.23	1.09	24.90	1.31	1.26	6.01	24.31	25.04
29	5.51	0.01	1.96	0.17	0.35	1.17	26.85	1.59	2.01	8.70	25.64	27.07
32	3.83	0.02	2.09	0.15	0.49	0.90	26.05	1.63	3.26	9.36	24.69	26.40
35	1.88	0.05	3.46	0.40	1.04	0.97	32.31	2.29	7.80	19.99	26.92	33.53
38	0.96	0.12	4.08	0.76	2.49	1.09	33.37	2.13	18.43	29.57	24.65	38.50
41	0.38	0.45	5.34	1.30	13.08	1.31	36.32	2.85	51.92	59.34	26.56	65.01

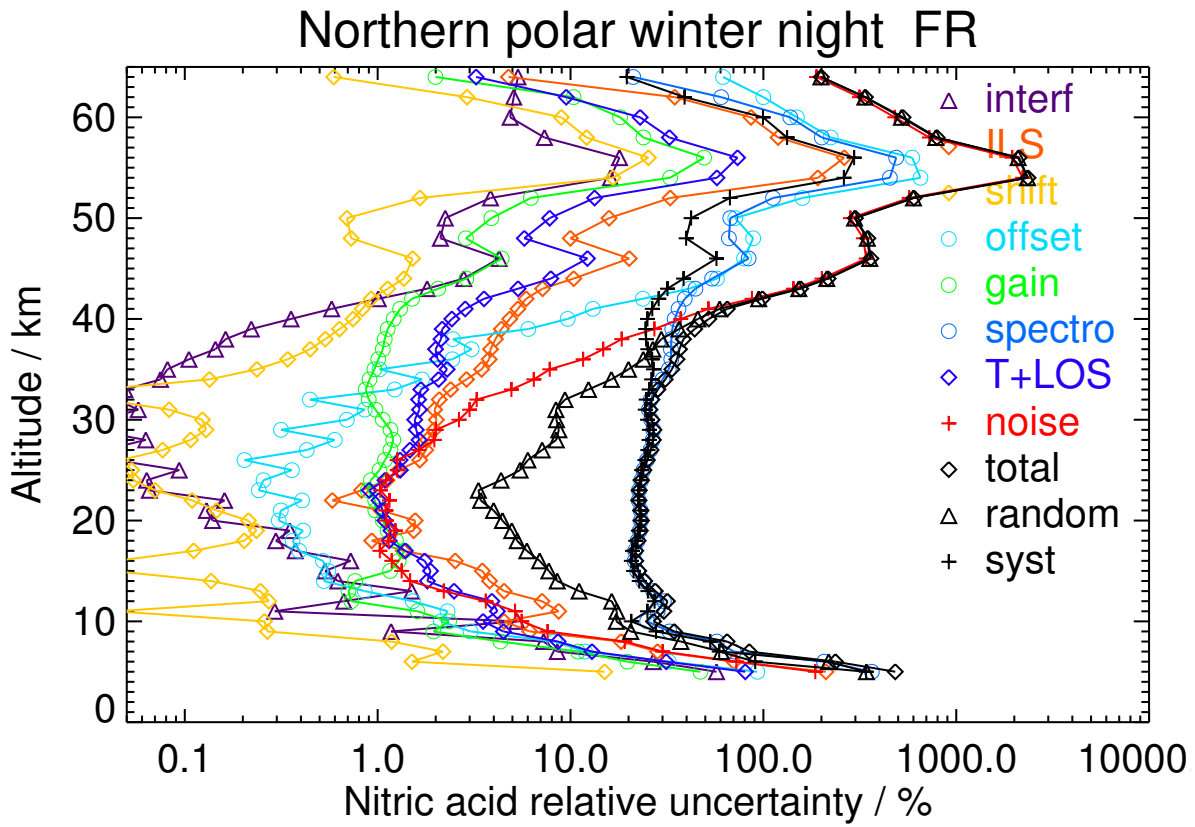


Figure S2: V8H_HNO₃_61 Northern polar winter night

Table S7: HNO₃ error budget for Northern polar spring day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.98	1.61	7.79	0.64	3.56	3.54	37.18	4.69	8.09	23.80	31.50	39.48
11	3.30	0.25	2.18	0.13	1.00	0.46	20.45	1.93	2.14	5.89	19.95	20.80
14	5.59	0.11	2.38	0.18	0.61	0.78	21.60	1.51	1.45	5.73	21.09	21.86
17	8.37	0.06	1.20	0.21	0.42	0.99	21.61	1.13	1.03	4.04	21.34	21.72
20	8.56	0.03	1.88	0.22	0.33	1.09	22.80	1.04	1.02	2.66	22.80	22.96
23	7.62	0.02	0.75	0.13	0.41	1.05	23.53	1.09	1.15	3.05	23.43	23.63
26	6.75	0.01	1.21	0.07	0.54	1.10	24.39	1.26	1.42	3.63	24.25	24.52
29	4.66	0.01	1.90	0.12	0.91	1.06	25.57	1.63	2.34	4.74	25.39	25.83
32	2.89	0.02	2.15	0.19	1.64	0.86	25.94	1.82	4.42	6.81	25.64	26.53
35	1.50	0.05	2.60	0.16	3.21	1.05	26.84	2.17	10.05	12.24	26.35	29.06
38	0.58	0.17	2.47	0.25	9.04	1.63	27.97	2.72	30.17	33.10	26.37	42.32
41	0.18	0.91	3.07	0.45	28.25	1.39	32.14	3.44	90.32	97.03	24.44	> 100

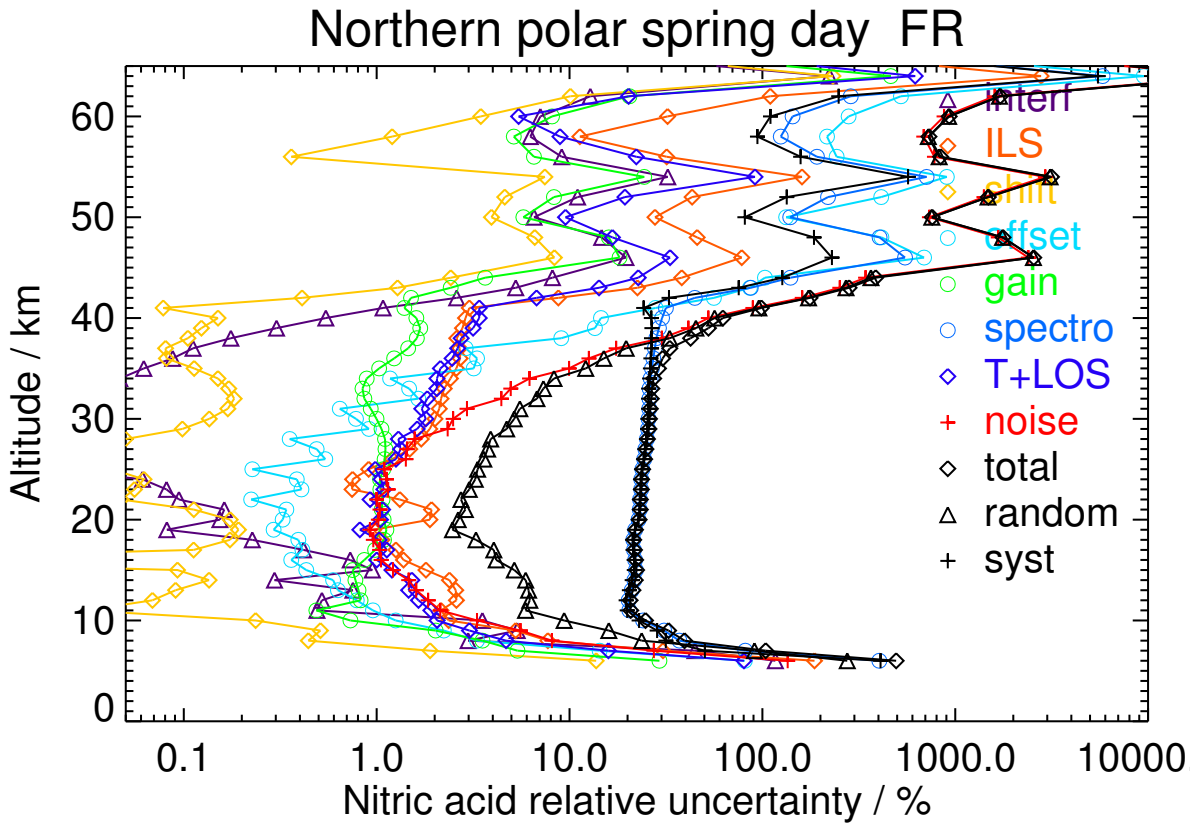


Figure S3: V8H.HNO₃.61 Northern polar spring day

Table S8: HNO₃ error budget for Northern polar spring night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.81	2.32	6.70	0.65	3.98	3.47	41.35	6.00	9.31	29.06	32.66	43.72
11	3.34	0.27	2.11	0.11	0.98	0.48	21.55	1.89	2.15	6.50	20.89	21.87
14	5.43	0.08	2.26	0.20	0.60	0.99	22.04	1.45	1.49	5.37	21.63	22.29
17	8.01	0.07	0.85	0.24	0.45	0.98	21.81	1.02	1.09	4.49	21.44	21.90
20	8.52	0.02	1.42	0.16	0.34	1.07	22.66	0.97	1.05	3.34	22.53	22.77
23	7.84	0.01	0.69	0.10	0.40	1.01	23.27	1.03	1.15	3.67	23.07	23.36
26	7.16	< 0.01	1.07	0.09	0.50	1.12	24.26	1.19	1.39	3.85	24.07	24.38
29	4.82	0.01	1.92	0.10	0.88	1.09	25.86	1.63	2.37	5.02	25.64	26.13
32	2.71	0.03	2.45	0.22	1.68	0.81	26.58	1.97	4.95	7.65	26.19	27.29
35	1.23	0.07	2.80	0.24	3.64	1.15	28.04	2.41	12.61	15.68	26.98	31.20
38	0.44	0.23	2.80	0.28	11.44	1.67	29.38	2.99	40.62	44.57	26.02	51.61
41	0.11	1.61	4.12	0.57	49.51	1.75	42.50	5.17	> 100	> 100	28.23	> 100

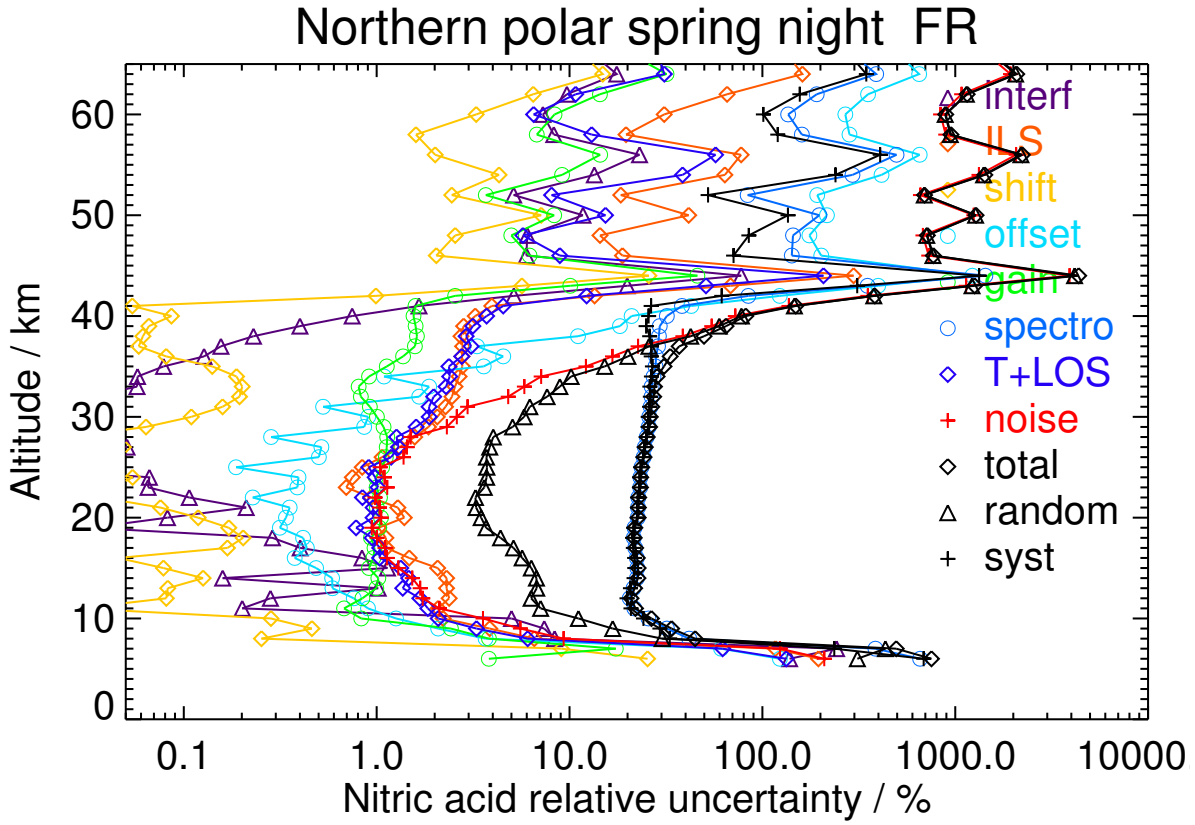


Figure S4: V8H_HNO₃_61 Northern polar spring night

Table S9: HNO₃ error budget for Northern polar summer day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.89	6.08	12.30	1.02	6.81	3.84	57.20	6.34	16.40	53.27	31.53	61.90
11	1.53	1.82	3.69	0.39	2.30	0.99	26.53	2.22	6.65	14.33	23.90	27.87
14	1.69	0.72	3.28	0.19	1.27	1.20	23.80	1.47	4.50	10.26	22.32	24.56
17	3.90	0.22	2.12	0.08	0.50	0.30	23.45	1.05	1.71	3.94	23.31	23.64
20	7.02	0.04	0.40	0.15	0.31	0.69	22.02	0.57	1.02	2.05	21.97	22.07
23	7.86	0.02	0.63	0.08	0.21	0.99	22.81	0.71	0.99	1.59	22.82	22.88
26	7.57	0.01	0.80	0.10	0.20	1.17	23.74	0.94	1.09	2.07	23.74	23.83
29	5.85	0.01	1.57	0.05	0.29	1.05	25.02	1.36	1.55	3.30	24.96	25.18
32	3.67	0.02	2.24	0.11	0.52	0.90	25.93	1.87	2.83	5.21	25.74	26.27
35	1.72	0.04	2.43	0.40	1.14	1.18	27.00	2.61	7.14	8.81	26.80	28.21
38	0.70	0.13	2.02	0.48	3.08	1.85	26.10	2.94	21.15	22.31	25.63	33.98
41	0.25	0.62	2.72	0.79	15.96	1.29	27.81	3.12	59.64	62.95	25.32	67.86

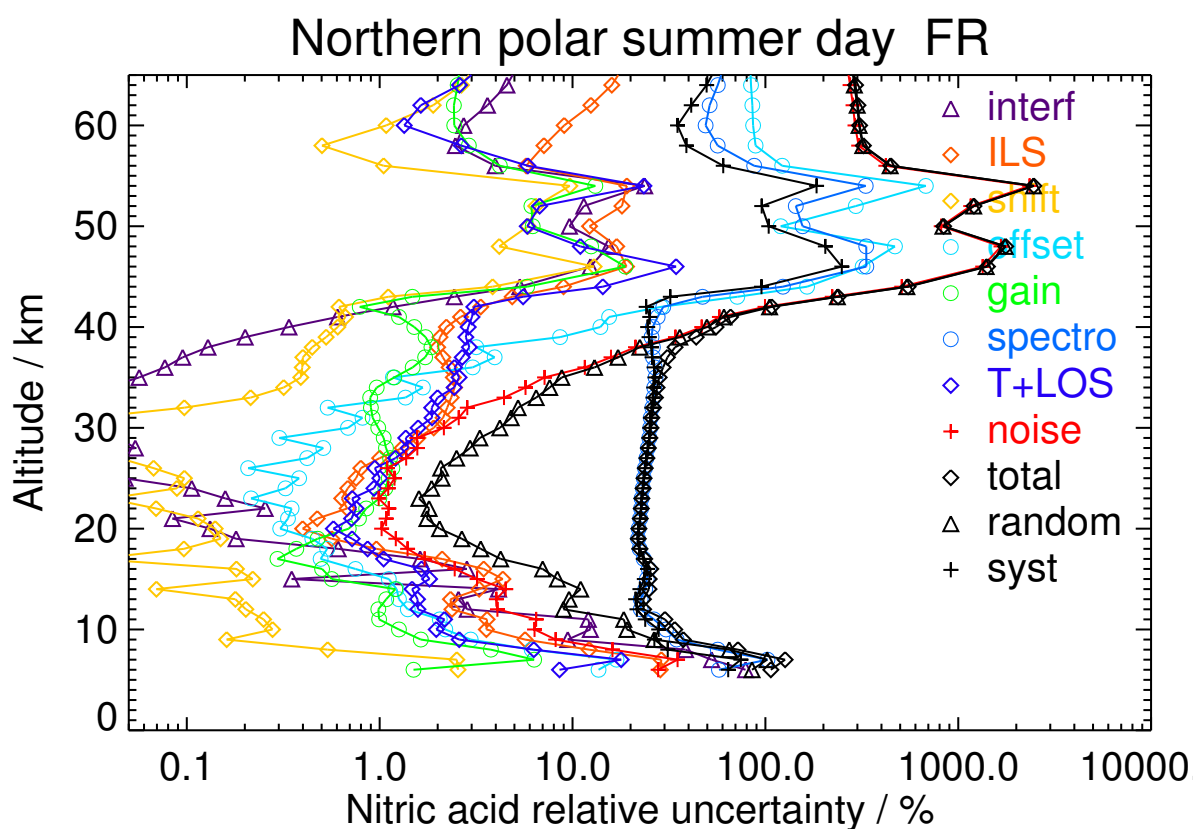


Figure S5: V8H_HNO₃_61 Northern polar summer day

Table S10: HNO₃ error budget for Northern polar summer night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.67	9.03	18.42	1.68	11.01	4.25	64.65	7.54	26.64	59.97	43.73	74.22
11	1.28	2.22	3.81	0.50	2.72	0.86	28.23	2.45	8.31	15.94	25.41	29.99
14	1.61	0.82	3.26	0.18	1.32	1.11	23.52	1.59	4.95	8.88	22.71	24.38
17	3.77	0.23	2.62	0.08	0.51	0.30	22.99	1.20	1.79	4.05	22.89	23.25
20	7.25	0.03	0.32	0.14	0.30	0.66	22.03	0.57	1.00	2.33	21.95	22.07
23	8.44	0.02	0.58	0.06	0.21	0.98	22.55	0.68	0.96	1.65	22.55	22.61
26	7.79	< 0.01	0.90	0.09	0.19	1.20	23.94	1.01	1.09	1.72	23.98	24.04
29	5.58	0.01	1.76	0.06	0.27	1.07	25.17	1.54	1.63	2.40	25.25	25.36
32	3.13	0.02	2.43	0.18	0.46	0.92	26.13	2.20	3.30	4.27	26.21	26.56
35	1.51	0.05	2.19	0.33	0.92	1.05	26.34	2.62	8.18	9.12	26.29	27.83
38	0.66	0.14	1.92	0.32	2.50	1.71	26.44	2.77	22.43	23.87	25.55	34.97
41	0.20	0.74	3.23	0.65	20.40	1.68	31.86	3.58	74.37	79.15	26.91	83.60

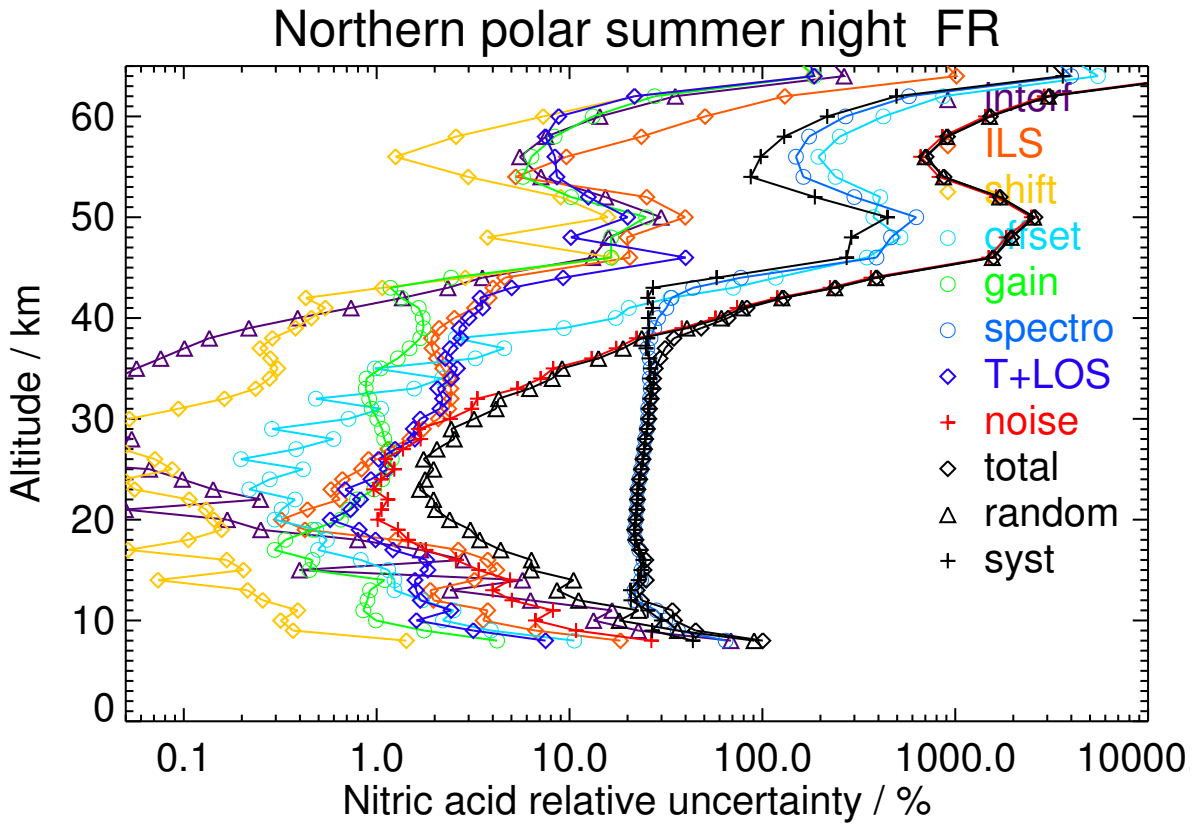


Figure S6: V8H_HNO3_61 Northern polar summer night

Table S11: HNO₃ error budget for Northern polar autumn day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.43	4.53	17.73	1.60	9.41	2.95	69.60	6.32	21.58	42.52	63.05	76.05
11	1.28	1.31	4.03	0.30	2.30	1.63	22.56	2.73	5.50	12.87	20.17	23.93
14	2.33	0.64	1.89	0.19	0.98	0.87	25.56	1.49	2.88	9.61	24.02	25.87
17	5.48	0.14	2.57	0.18	0.58	0.47	22.58	1.39	1.41	6.44	21.90	22.83
20	9.20	0.05	0.66	0.11	0.41	0.63	21.92	0.74	1.06	3.32	21.73	21.99
23	11.25	0.02	0.72	0.17	0.34	0.75	22.42	0.79	1.01	2.56	22.34	22.48
26	10.68	0.01	1.04	0.18	0.35	1.04	23.75	1.10	1.17	2.68	23.70	23.85
29	7.56	0.01	1.51	0.09	0.56	1.13	25.63	1.65	1.81	4.35	25.46	25.83
32	4.21	0.02	2.26	0.14	1.03	1.04	27.46	2.31	3.67	6.98	27.04	27.93
35	1.73	0.06	3.78	0.64	2.30	1.00	30.06	3.06	10.17	13.45	29.27	32.21
38	0.57	0.21	5.44	1.02	6.71	0.96	30.74	3.83	35.51	38.12	29.07	47.93
41	0.17	1.00	5.37	1.14	37.75	0.95	31.60	6.03	> 100	> 100	18.29	> 100

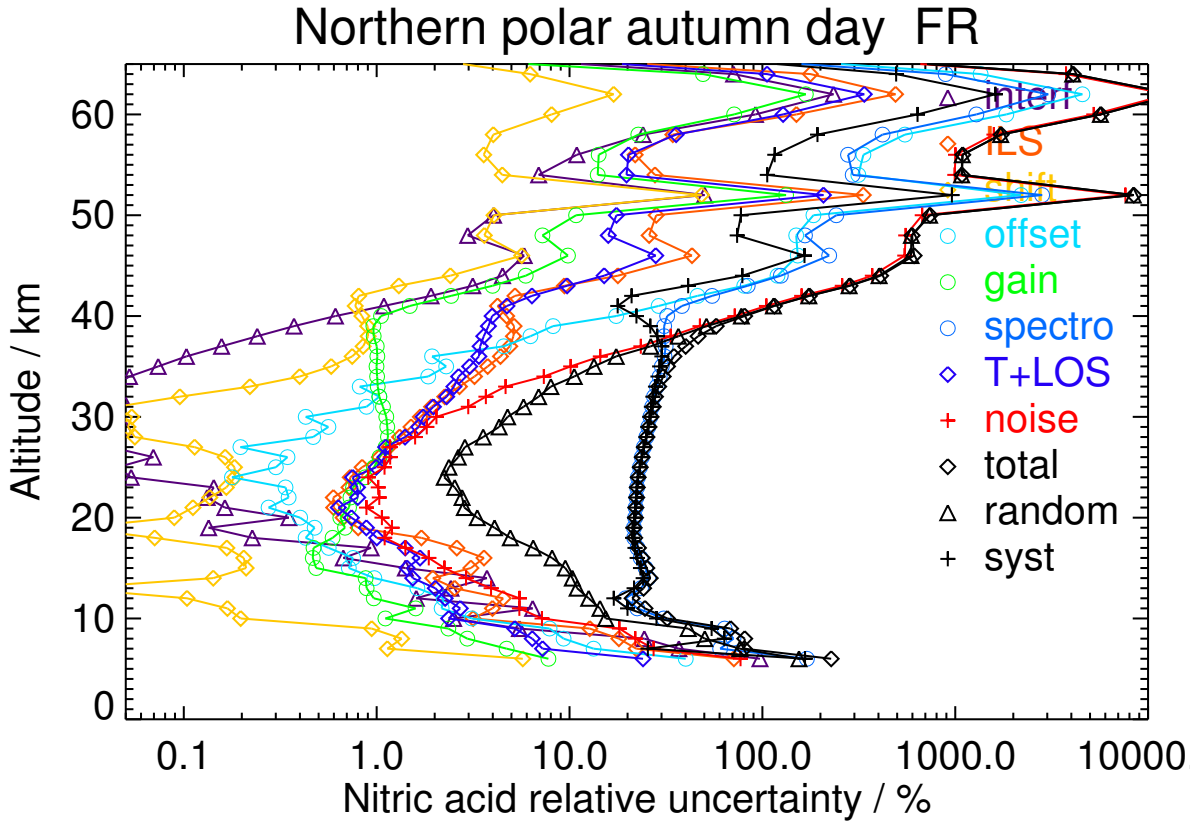


Figure S7: V8H_HNO₃_61 Northern polar autumn day

Table S12: HNO₃ error budget for Northern polar autumn night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.52	2.34	13.43	1.28	7.12	2.73	54.00	5.67	16.41	34.70	47.53	58.85
11	1.42	0.86	3.56	0.25	2.04	1.39	21.75	2.45	4.71	12.83	18.88	22.82
14	2.86	0.37	2.43	0.21	0.89	0.74	24.64	1.76	2.50	7.23	23.91	24.98
17	6.96	0.09	2.52	0.12	0.53	0.44	21.88	1.40	1.28	4.57	21.64	22.12
20	10.49	0.04	0.55	0.12	0.39	0.70	22.23	0.79	1.05	2.81	22.11	22.29
23	12.36	0.02	0.85	0.18	0.32	0.82	22.83	0.89	0.98	2.13	22.80	22.90
26	10.33	0.01	1.30	0.17	0.41	1.14	24.67	1.32	1.25	2.72	24.65	24.80
29	6.80	0.01	1.80	0.10	0.69	1.17	26.10	1.83	2.07	4.31	25.99	26.35
32	3.64	0.02	2.55	0.16	1.28	1.04	27.53	2.41	4.35	7.06	27.24	28.14
35	1.57	0.06	3.72	0.59	2.80	1.00	29.75	2.88	11.37	15.11	28.59	32.34
38	0.65	0.18	4.15	0.77	6.20	1.18	38.41	2.70	31.14	41.44	28.15	50.10
41	0.50	0.33	1.97	0.48	12.27	1.62	48.36	1.79	45.35	63.93	21.67	67.50

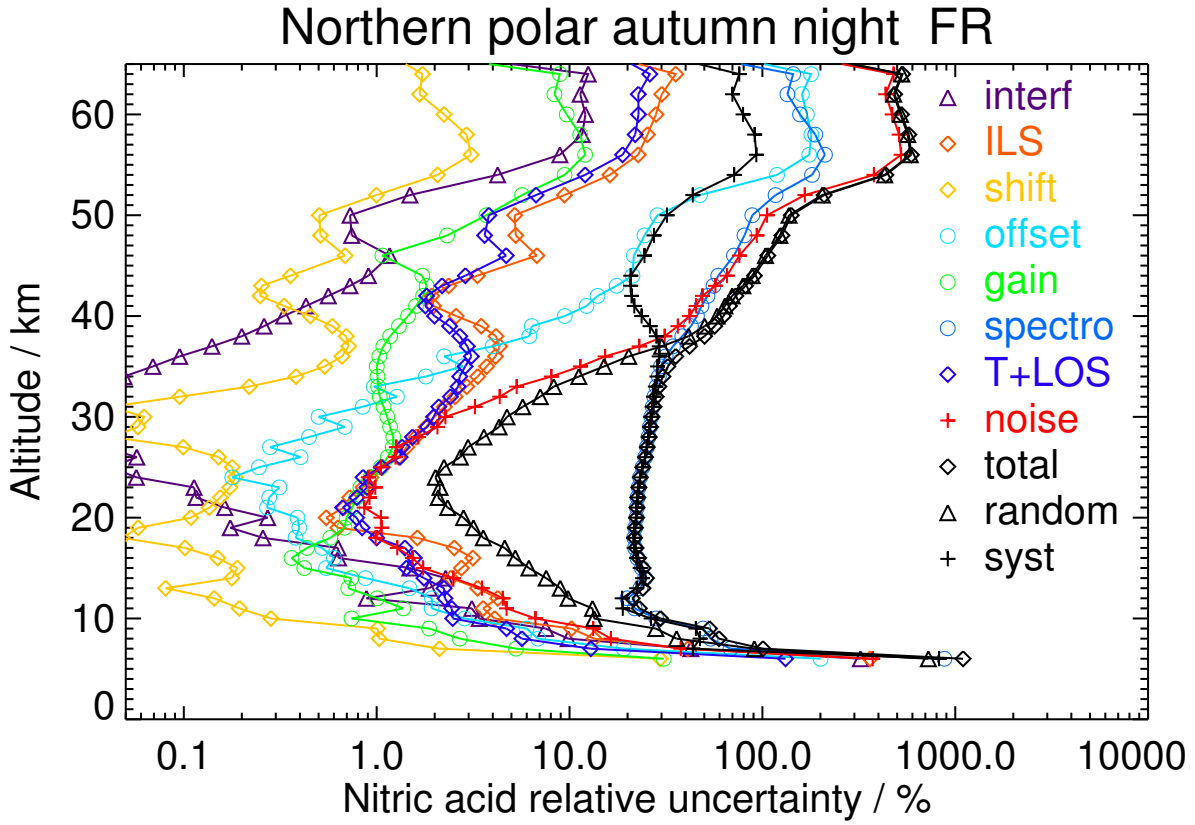


Figure S8: V8H_HNO3.61 Northern polar autumn night

Table S13: HNO₃ error budget for Northern midlatitude winter day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.07	16.33	> 100	16.58	> 100	19.80	> 100	55.09	> 100	> 100	> 100	> 100
8	0.24	8.36	26.92	2.90	20.63	5.78	> 100	13.69	47.83	> 100	65.17	> 100
11	1.80	0.49	3.39	0.26	1.79	1.01	25.35	2.58	4.91	14.18	22.10	26.26
14	3.91	0.14	2.73	0.24	0.59	0.89	23.78	1.38	2.03	10.15	21.85	24.09
17	6.44	0.07	1.39	0.09	0.43	0.94	22.53	0.95	1.26	6.15	21.80	22.65
20	8.84	0.02	0.63	0.15	0.32	0.74	22.26	0.68	0.98	3.27	22.08	22.32
23	10.32	0.01	0.58	0.11	0.20	0.93	22.84	0.72	0.91	3.00	22.70	22.90
26	9.60	< 0.01	0.98	0.08	0.15	1.09	23.93	0.94	1.06	3.69	23.73	24.01
29	7.29	0.01	1.82	0.09	0.27	1.05	25.35	1.32	1.55	5.34	24.95	25.52
32	3.83	0.02	2.71	0.16	0.62	1.03	27.57	2.12	3.36	7.24	27.06	28.02
35	1.38	0.06	3.04	0.40	1.52	1.16	29.69	3.16	10.85	14.72	28.38	31.97
38	0.50	0.23	2.71	0.59	5.66	1.48	28.76	3.31	35.87	38.77	25.77	46.55
41	0.21	0.82	2.56	0.54	23.18	0.89	27.08	3.11	91.30	95.81	21.11	98.11

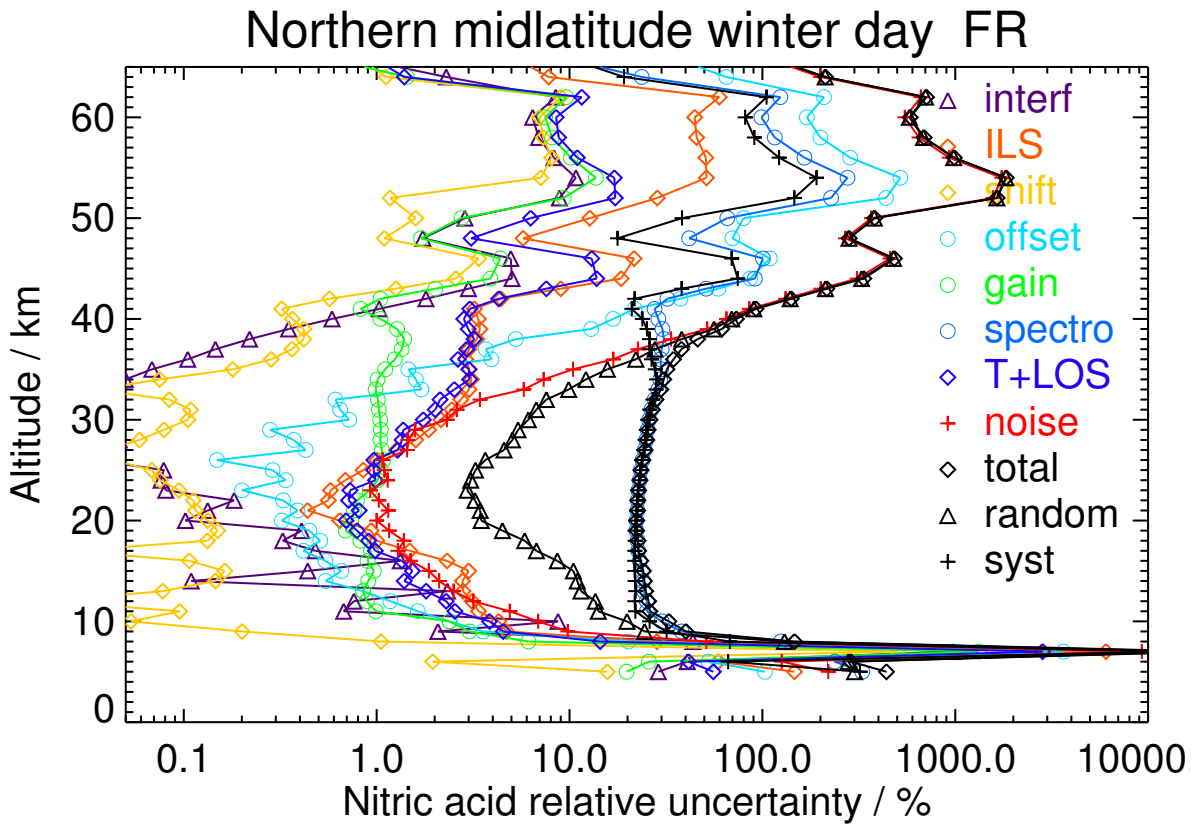


Figure S9: V8H_HNO₃_61 Northern midlatitude winter day

Table S14: HNO₃ error budget for Northern midlatitude winter night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.01	> 100	> 100	> 100	> 100	> 100	> 100	> 100	> 100	> 100	> 100	> 100
8	0.07	21.89	> 100	12.89	83.58	14.07	> 100	67.21	> 100	> 100	> 100	> 100
11	1.85	0.77	4.94	0.19	2.02	1.46	22.51	3.86	4.67	11.88	20.82	23.97
14	4.45	0.13	2.07	0.17	0.49	0.86	23.95	1.39	1.77	9.31	22.31	24.17
17	6.78	0.08	1.62	0.09	0.44	1.06	21.63	1.14	1.18	6.87	20.67	21.78
20	9.03	0.02	0.92	0.18	0.34	0.82	21.44	0.69	0.95	3.79	21.17	21.51
23	10.09	0.01	0.64	0.10	0.24	0.90	22.25	0.70	0.90	2.80	22.14	22.31
26	9.50	< 0.01	0.89	0.08	0.20	1.07	23.68	0.91	1.02	3.61	23.49	23.76
29	7.35	0.01	1.54	0.07	0.28	1.07	25.21	1.28	1.46	5.00	24.85	25.35
32	4.16	0.02	2.62	0.13	0.59	1.02	27.04	2.15	2.97	6.30	26.71	27.44
35	1.38	0.06	3.78	0.39	1.58	0.96	30.47	3.70	10.52	13.86	29.64	32.72
38	0.53	0.21	2.77	0.58	4.27	1.27	26.74	3.10	32.76	35.39	23.94	42.73
41	0.11	1.49	7.41	1.20	42.33	1.89	51.15	5.71	> 100	> 100	33.24	> 100

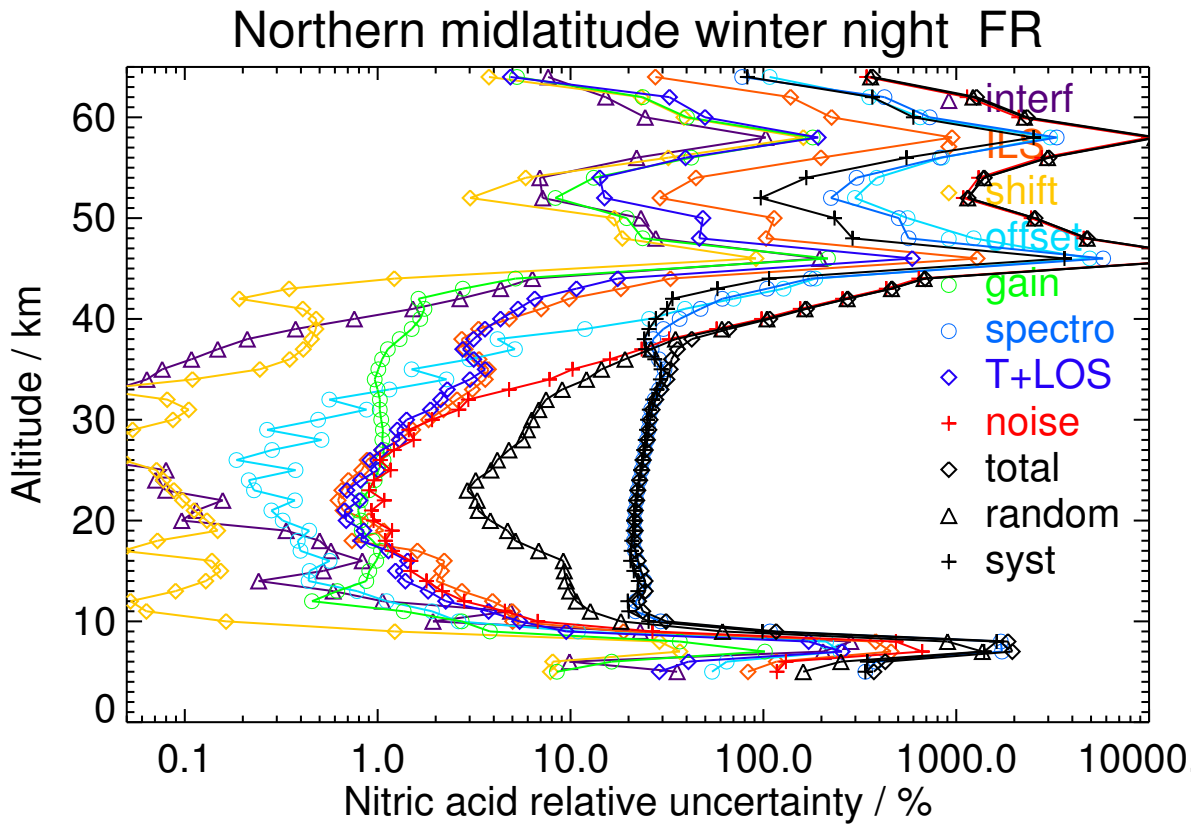


Figure S10: V8H_HNO₃_61 Northern midlatitude winter night

Table S15: HNO₃ error budget for Northern midlatitude spring day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.44	3.30	13.33	1.09	7.50	5.76	48.36	6.80	16.25	45.33	29.56	54.11
11	2.44	0.36	2.80	0.14	1.26	0.72	24.35	1.74	2.82	10.40	22.48	24.78
14	2.99	0.14	1.97	0.14	0.95	1.29	24.95	1.55	2.35	11.87	22.28	25.24
17	4.85	0.08	2.40	0.21	0.73	0.86	23.79	1.38	1.66	8.66	22.42	24.03
20	7.66	0.03	1.38	0.18	0.45	0.83	22.93	0.95	1.19	4.65	22.56	23.04
23	7.83	0.02	0.81	0.11	0.46	1.04	23.43	1.13	1.24	3.21	23.32	23.54
26	6.90	0.01	1.11	0.10	0.60	1.09	24.31	1.38	1.55	3.68	24.17	24.45
29	4.51	0.02	2.03	0.15	1.05	1.07	25.92	1.89	2.66	5.47	25.67	26.25
32	2.47	0.03	2.51	0.28	2.11	0.80	26.39	2.19	5.55	8.22	26.00	27.27
35	1.14	0.07	2.83	0.27	4.50	0.96	26.72	2.53	13.72	15.60	26.35	30.62
38	0.44	0.23	2.42	0.25	13.08	1.34	26.74	2.78	40.81	44.06	25.02	50.67
41	0.18	1.00	2.98	0.57	31.81	0.84	28.16	3.05	97.01	> 100	22.76	> 100

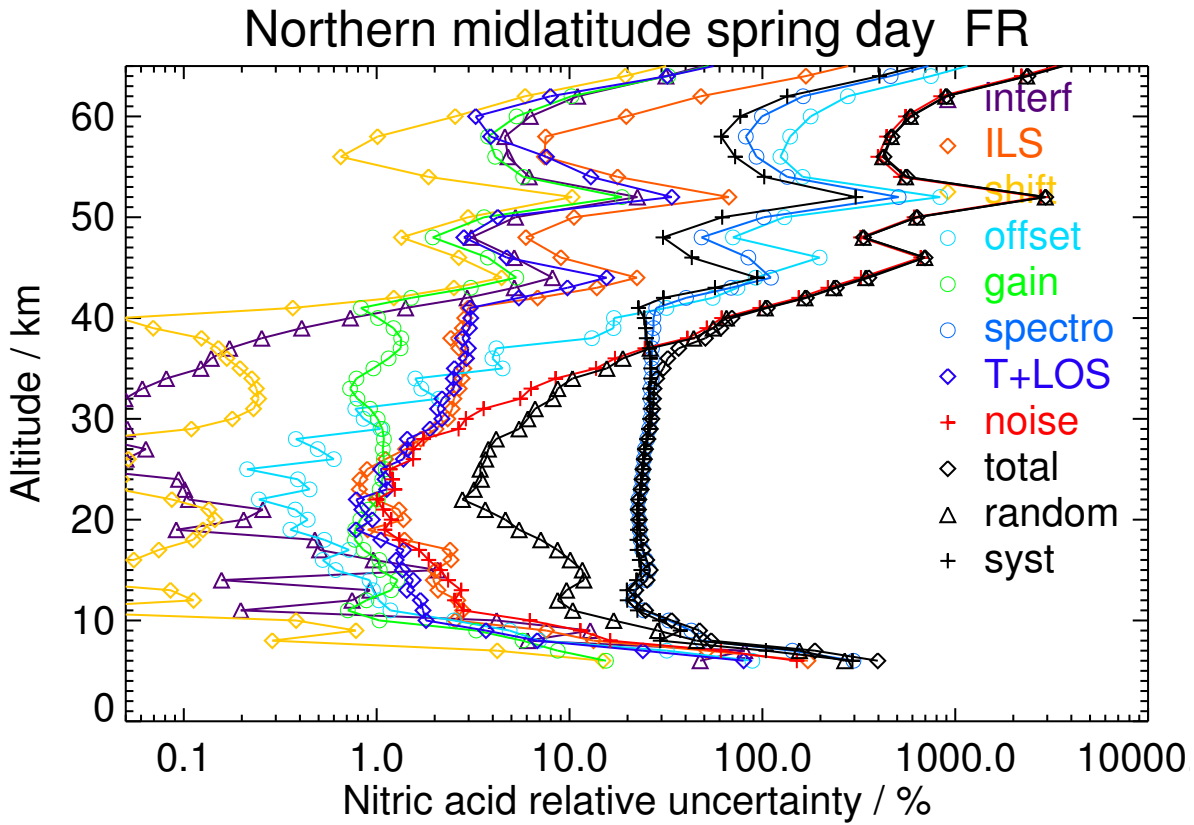


Figure S11: V8H_HNO₃_61 Northern midlatitude spring day

Table S16: HNO₃ error budget for Northern midlatitude spring night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.72	2.34	10.52	0.83	5.22	3.53	45.50	5.52	10.69	41.28	25.83	48.70
11	2.75	0.32	2.12	0.16	1.08	0.70	22.41	1.47	2.54	7.01	21.63	22.74
14	3.50	0.10	2.49	0.18	0.77	1.32	22.92	1.42	1.97	9.92	21.01	23.23
17	5.45	0.09	1.21	0.22	0.56	0.78	22.45	0.97	1.38	7.16	21.40	22.56
20	7.71	0.02	0.72	0.14	0.38	0.90	22.21	0.80	1.07	3.77	21.96	22.28
23	7.77	0.02	0.76	0.12	0.37	1.05	23.09	1.00	1.13	2.61	23.03	23.17
26	6.87	0.01	1.08	0.08	0.50	1.10	24.06	1.24	1.41	2.67	24.04	24.19
29	4.58	0.01	2.03	0.08	0.92	1.04	25.69	1.69	2.45	3.75	25.70	25.98
32	2.57	0.03	2.45	0.24	1.79	0.84	26.30	2.02	5.16	6.61	26.24	27.06
35	1.25	0.06	2.23	0.23	3.68	1.22	26.55	2.23	12.11	13.77	26.21	29.60
38	0.52	0.19	1.97	0.30	9.81	1.68	25.89	2.55	33.82	36.29	24.64	43.86
41	0.16	1.06	2.53	0.60	30.48	1.08	24.79	3.34	> 100	> 100	21.10	> 100

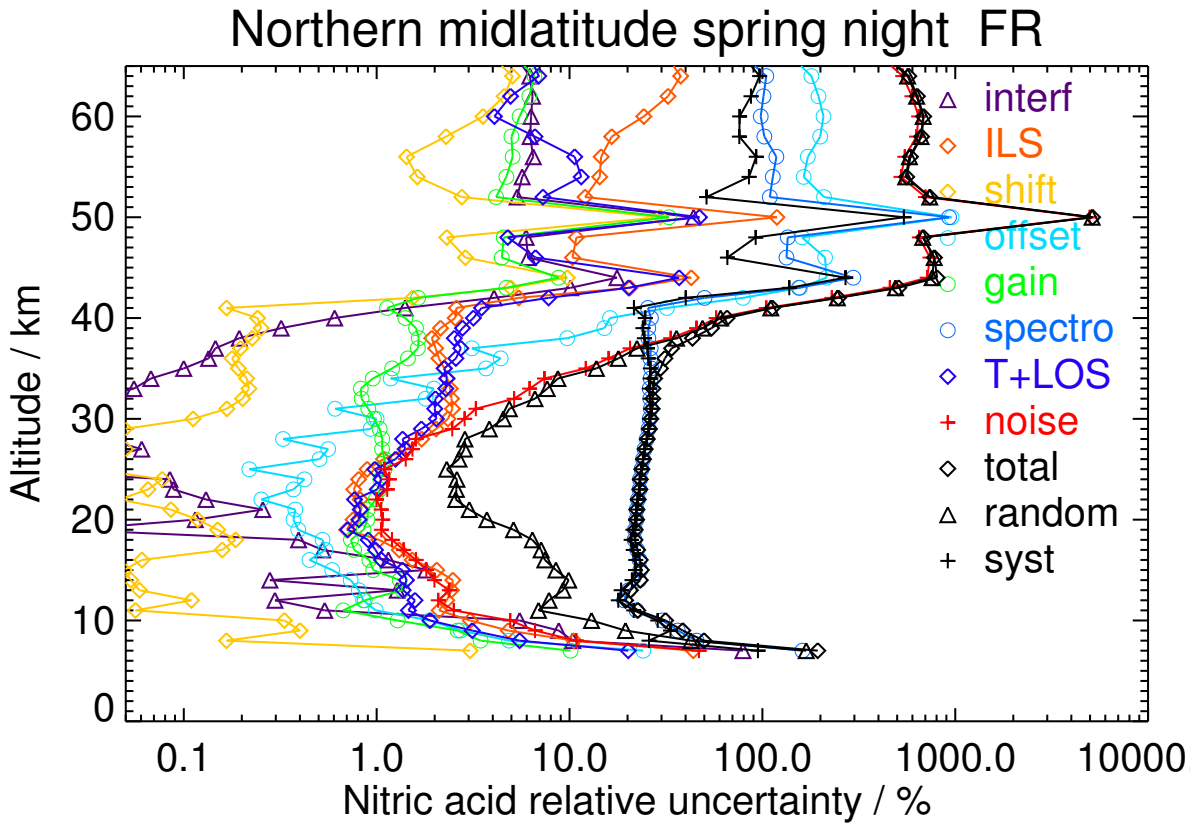


Figure S12: V8H_HNO₃_61 Northern midlatitude spring night

Table S17: HNO₃ error budget for Northern midlatitude summer day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.36	16.35	26.56	1.14	17.68	15.12	92.53	16.49	44.14	81.15	75.58	> 100
11	0.64	3.52	6.18	0.46	6.57	5.21	44.29	4.94	16.96	34.53	34.68	48.94
14	0.90	1.01	4.44	0.25	3.82	1.48	26.96	2.67	9.40	20.73	20.74	29.33
17	1.75	0.34	4.31	0.16	1.47	0.63	29.84	1.94	4.33	14.66	26.82	30.57
20	5.18	0.05	1.41	0.21	0.53	0.44	23.29	0.94	1.42	4.86	22.89	23.40
23	7.38	0.02	0.64	0.06	0.23	0.96	23.04	0.70	1.07	2.07	23.01	23.10
26	6.60	0.01	0.93	0.14	0.20	1.14	24.06	1.07	1.26	2.22	24.06	24.17
29	5.07	0.01	1.80	0.07	0.32	0.96	24.93	1.40	1.80	2.60	24.98	25.12
32	2.93	0.02	2.47	0.18	0.64	0.93	26.15	1.92	3.64	4.34	26.26	26.61
35	1.44	0.05	1.97	0.29	1.30	1.11	25.93	2.33	8.70	9.29	25.97	27.58
38	0.64	0.14	1.84	0.26	3.68	1.68	25.90	2.50	23.63	24.41	25.68	35.43
41	0.20	0.78	3.22	0.53	18.14	1.36	31.47	3.21	69.93	73.76	28.16	78.95

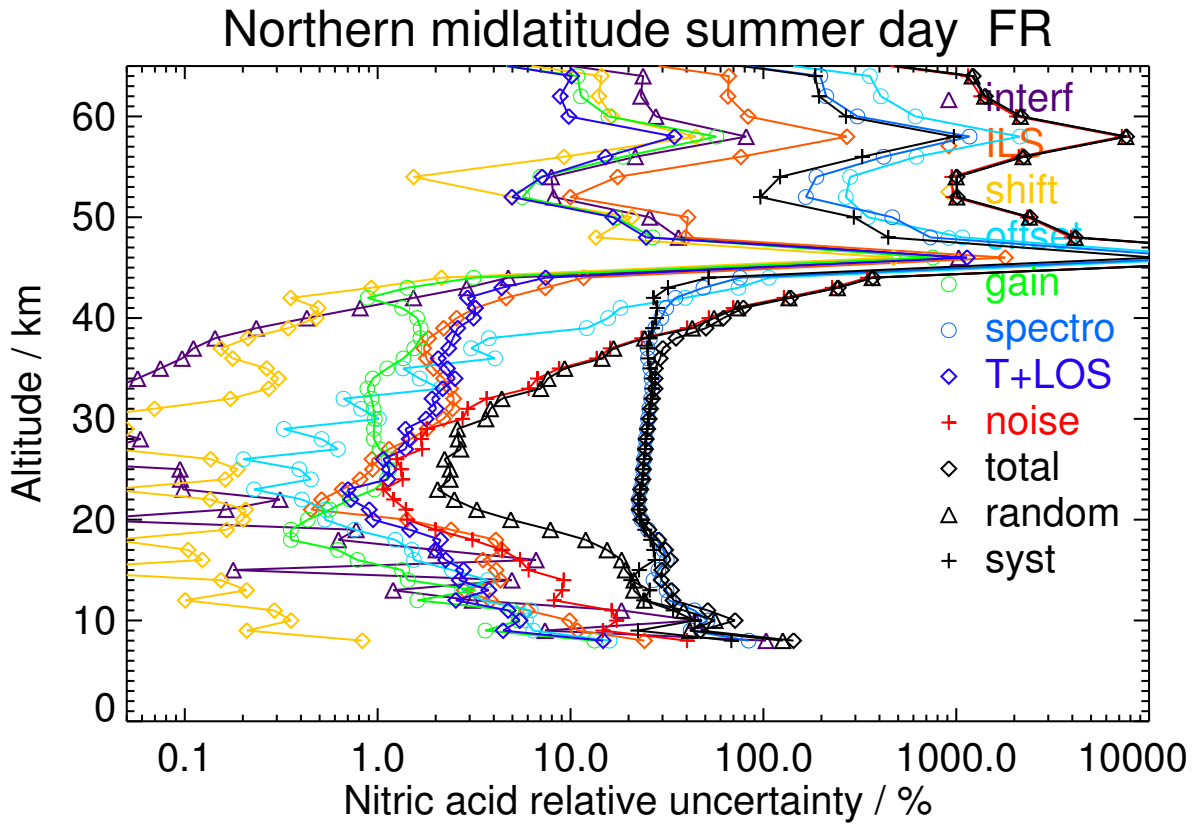


Figure S13: V8H_HNO₃_61 Northern midlatitude summer day

Table S18: HNO₃ error budget for Northern midlatitude summer night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.40	14.35	29.67	1.53	18.98	17.14	> 100	18.34	45.73	87.71	87.04	> 100
11	0.42	5.92	10.45	0.75	10.58	8.16	74.68	8.66	28.58	55.19	61.19	82.41
14	1.02	0.83	4.50	0.23	3.14	1.58	19.12	2.91	8.58	15.39	15.63	21.93
17	1.83	0.31	3.73	0.11	1.13	0.78	28.62	1.82	4.01	12.54	26.41	29.23
20	5.60	0.04	1.51	0.18	0.47	0.47	22.30	0.93	1.31	4.45	21.98	22.42
23	7.82	0.02	0.74	0.08	0.22	0.92	22.67	0.68	1.06	2.23	22.63	22.74
26	6.92	0.01	0.96	0.11	0.18	1.17	24.00	1.12	1.23	2.46	23.98	24.10
29	5.09	0.01	1.75	0.06	0.27	1.00	25.05	1.54	1.77	2.65	25.10	25.24
32	2.94	0.02	2.31	0.18	0.44	0.91	25.98	2.07	3.50	4.25	26.08	26.42
35	1.51	0.05	2.07	0.34	0.84	1.06	26.19	2.40	8.09	8.78	26.20	27.63
38	0.70	0.13	1.90	0.22	2.20	1.59	25.97	2.53	21.15	22.10	25.51	33.75
41	0.30	0.52	2.69	0.37	12.96	1.18	28.69	2.46	49.99	53.47	25.43	59.20

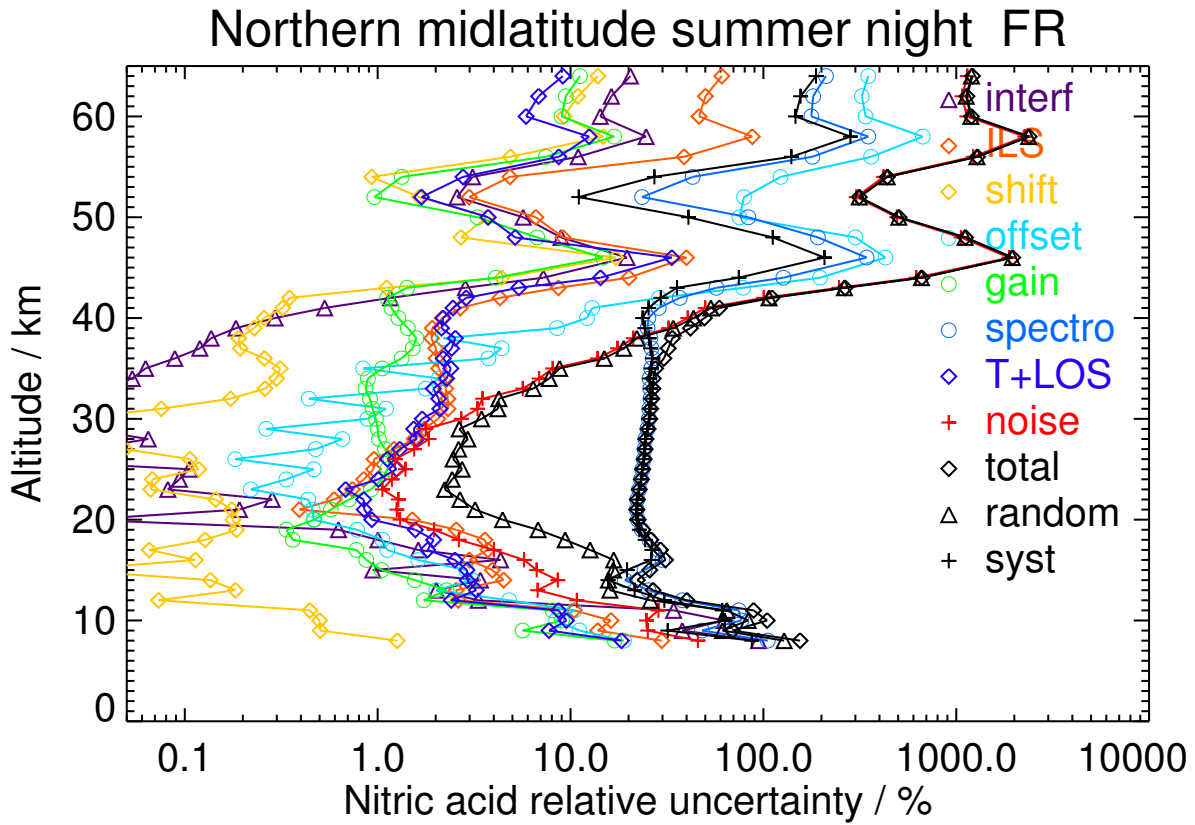


Figure S14: V8H_HNO₃_61 Northern midlatitude summer night

Table S19: HNO₃ error budget for Northern midlatitude autumn day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.17	19.66	83.34	5.36	41.52	14.67	> 100	19.70	74.41	> 100	99.73	> 100
11	0.44	6.62	15.19	1.07	9.17	3.52	58.43	6.35	23.66	43.11	50.28	66.23
14	0.94	0.81	7.14	0.32	2.78	1.61	31.71	3.50	8.05	24.28	23.56	33.83
17	3.16	0.31	3.93	0.17	0.77	0.54	28.13	1.95	2.35	12.07	25.91	28.58
20	7.53	0.04	1.09	0.21	0.51	0.71	22.62	0.88	1.14	5.86	21.94	22.71
23	9.39	0.02	0.75	0.14	0.32	0.94	22.56	0.82	1.03	3.30	22.39	22.63
26	8.26	0.01	1.11	0.08	0.30	1.11	23.89	1.22	1.18	3.01	23.82	24.01
29	5.87	0.01	1.81	0.11	0.43	1.02	25.22	1.63	1.74	3.64	25.16	25.42
32	3.34	0.02	2.47	0.17	0.70	0.86	26.33	2.21	3.46	5.29	26.26	26.79
35	1.50	0.05	2.77	0.17	1.55	0.82	27.55	2.79	9.06	10.42	27.41	29.32
38	0.65	0.15	2.23	0.25	3.58	1.29	26.36	2.66	25.04	26.32	25.61	36.73
41	0.24	0.65	3.01	0.33	20.36	1.25	29.69	2.90	73.17	77.42	25.98	81.67

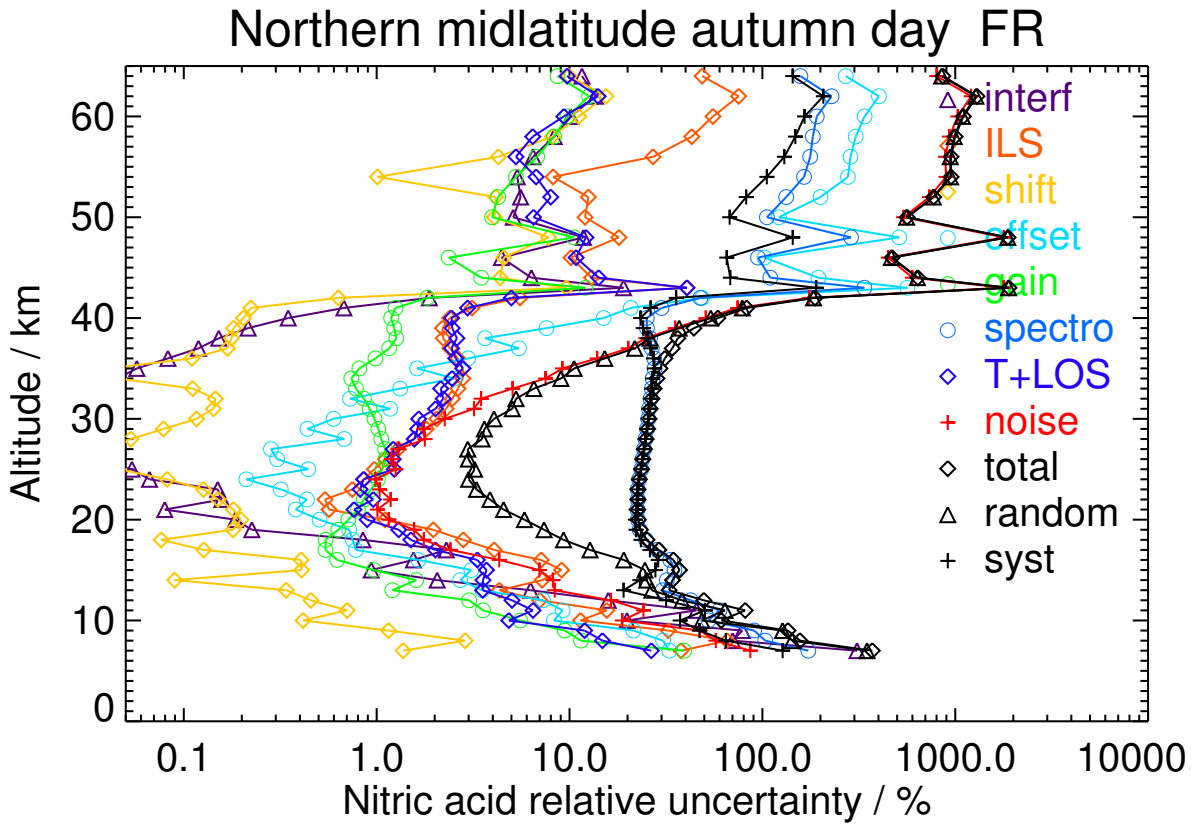


Figure S15: V8H_HNO3_61 Northern midlatitude autumn day

Table S20: HNO₃ error budget for Northern midlatitude autumn night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.10	21.46	48.92	4.75	31.64	15.10	> 100	20.20	72.45	> 100	> 100	> 100
11	0.93	2.63	3.48	0.34	3.04	1.85	28.04	2.68	8.25	17.62	24.14	29.89
14	1.32	0.67	2.84	0.24	1.66	0.94	27.45	2.08	5.07	13.77	24.62	28.21
17	4.14	0.19	3.92	0.18	0.71	0.54	23.20	1.68	1.81	8.02	22.28	23.68
20	7.61	0.04	0.65	0.16	0.45	0.76	22.50	0.82	1.17	5.31	21.94	22.57
23	9.28	0.02	0.70	0.15	0.36	0.87	22.78	0.88	1.07	4.07	22.49	22.86
26	8.30	0.01	1.10	0.10	0.40	1.08	24.11	1.21	1.27	3.55	23.97	24.23
29	6.04	0.01	1.72	0.11	0.60	1.08	25.25	1.64	1.90	3.77	25.18	25.46
32	3.34	0.02	2.60	0.15	1.08	0.92	26.53	2.33	3.86	5.49	26.51	27.07
35	1.51	0.05	3.11	0.26	2.35	0.78	27.05	2.79	9.87	11.17	26.99	29.21
38	0.54	0.18	3.31	0.40	6.15	1.11	27.92	3.15	31.85	33.45	27.12	43.06
41	0.19	0.80	3.44	0.52	28.75	1.03	31.20	3.24	> 100	> 100	25.71	> 100

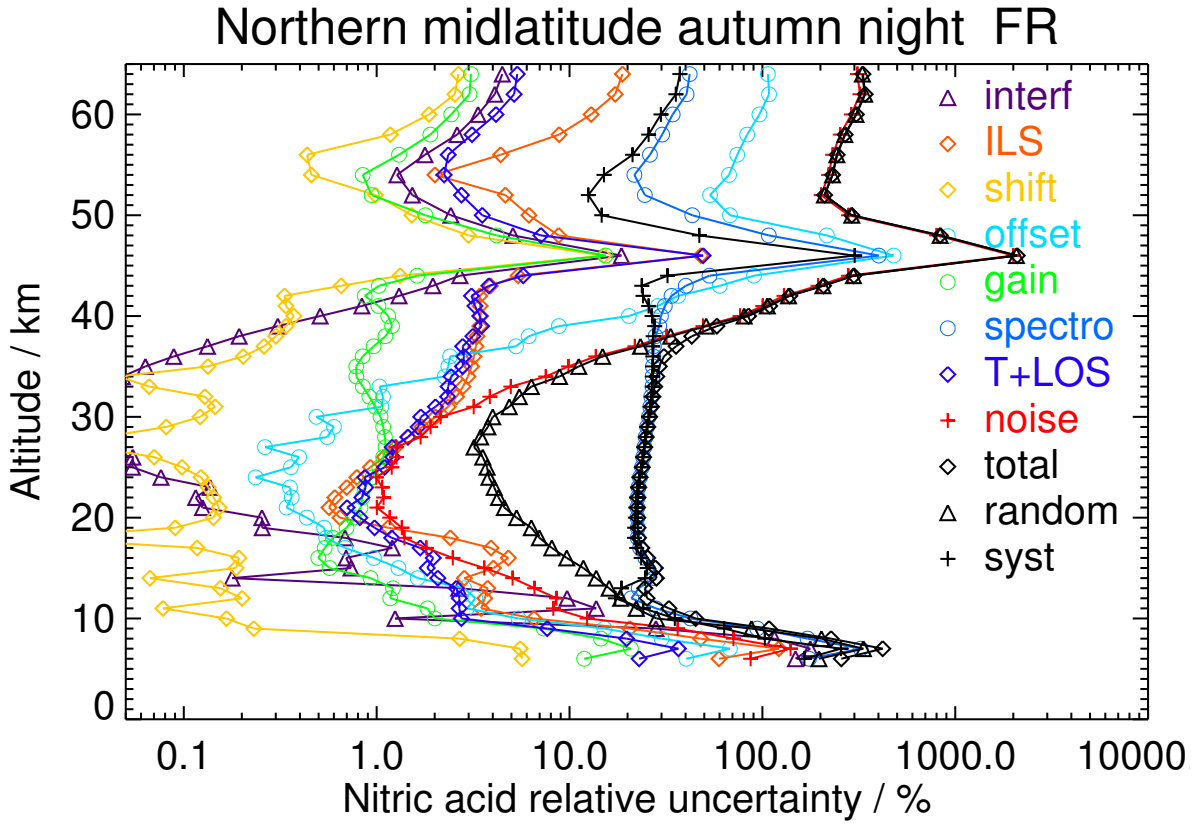


Figure S16: V8H_HNO₃_61 Northern midlatitude autumn night

Table S21: HNO₃ error budget for Tropics day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.25	20.28	26.06	0.67	15.75	35.62	> 100	19.04	41.71	> 100	71.22	> 100
11	0.05	34.12	47.27	2.54	65.76	84.32	> 100	51.13	> 100	> 100	56.21	> 100
14	0.16	4.58	16.02	1.25	19.46	7.17	51.14	8.28	39.42	57.30	40.80	70.34
17	0.02	19.55	> 100	21.31	> 100	30.79	> 100	> 100	> 100	> 100	> 100	> 100
20	1.85	0.12	2.42	0.53	1.88	0.62	26.07	1.63	4.13	11.67	23.94	26.63
23	2.99	0.05	0.71	0.17	1.13	0.78	24.29	1.00	2.76	5.91	23.79	24.52
26	3.71	0.02	0.70	0.07	1.03	0.83	24.58	1.06	2.56	6.27	23.98	24.79
29	3.51	0.02	1.60	0.07	1.22	0.82	25.43	1.31	3.15	6.22	24.98	25.75
32	2.77	0.03	2.07	0.16	1.73	0.78	25.31	1.58	4.70	6.20	25.19	25.94
35	1.41	0.06	2.63	0.25	3.47	1.10	27.25	2.22	10.71	12.09	27.14	29.71
38	0.66	0.15	2.31	0.24	8.28	1.31	25.62	2.16	26.09	27.93	25.24	37.65
41	0.21	0.84	4.07	0.39	26.16	1.14	31.82	2.79	80.32	85.58	29.15	90.41

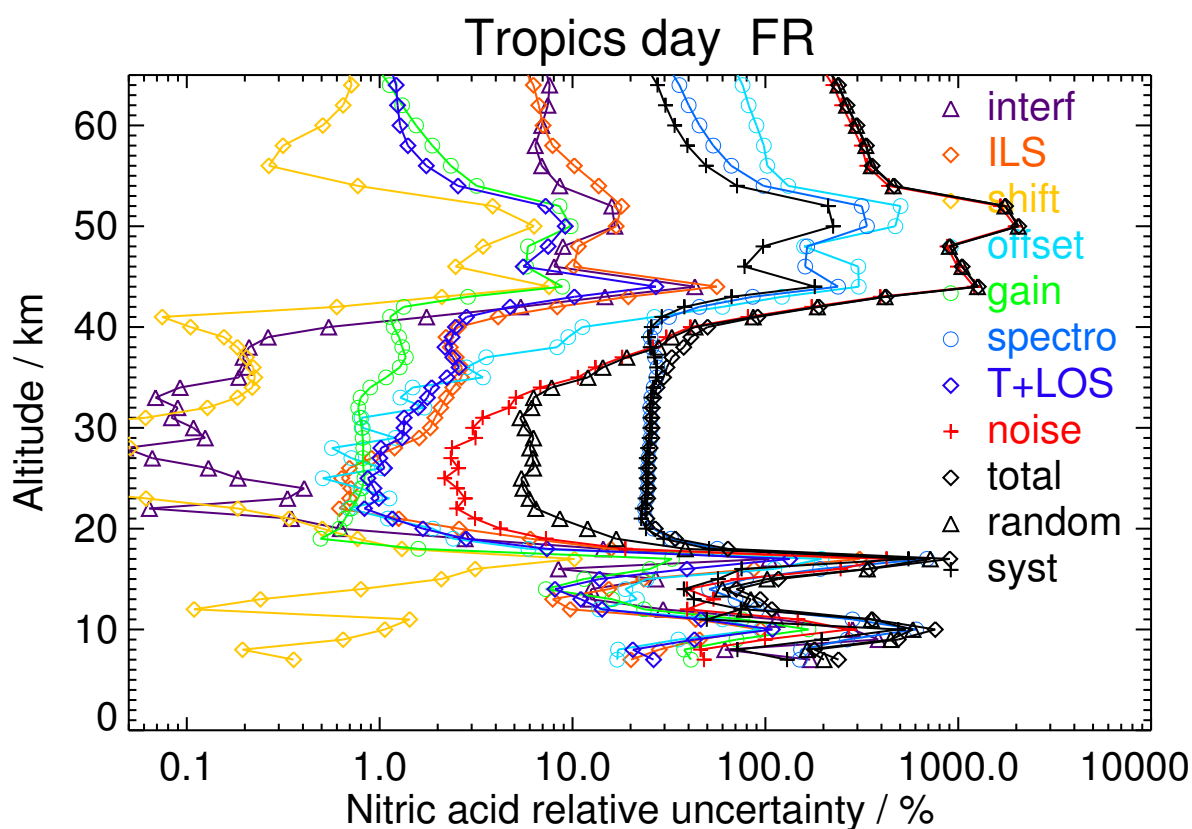


Figure S17: V8H.HNO₃.61 Tropics day

Table S22: HNO₃ error budget for Tropics night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.15	13.40	11.50	0.52	15.61	19.04	82.15	12.01	38.20	91.18	30.91	96.28
11	0.06	29.90	48.59	1.91	47.45	33.69	> 100	25.04	> 100	> 100	38.09	> 100
14	0.07	11.79	22.70	1.44	36.56	13.15	84.30	13.81	73.47	> 100	44.38	> 100
17	-0.03	9.27	> 100	6.33	> 100	14.10	> 100	70.75	> 100	> 100	> 100	> 100
20	1.14	0.16	2.98	0.73	3.20	0.40	27.98	2.29	6.57	14.74	25.18	29.18
23	2.48	0.04	0.70	0.23	1.51	0.74	24.64	1.07	3.37	7.38	23.84	24.96
26	3.23	0.02	0.81	0.08	1.27	0.81	24.78	1.13	2.97	6.42	24.21	25.04
29	2.97	0.02	1.65	0.10	1.56	0.79	25.51	1.37	3.78	6.95	24.99	25.93
32	2.39	0.03	1.70	0.16	2.16	0.78	25.34	1.50	5.55	6.71	25.27	26.14
35	1.46	0.05	1.61	0.23	3.59	1.28	26.14	1.78	10.53	11.49	26.13	28.54
38	0.76	0.13	1.80	0.38	7.50	1.53	26.01	2.00	23.32	25.10	25.61	35.86
41	0.22	0.78	4.00	0.64	22.98	1.29	33.64	2.82	72.57	77.33	31.20	83.38

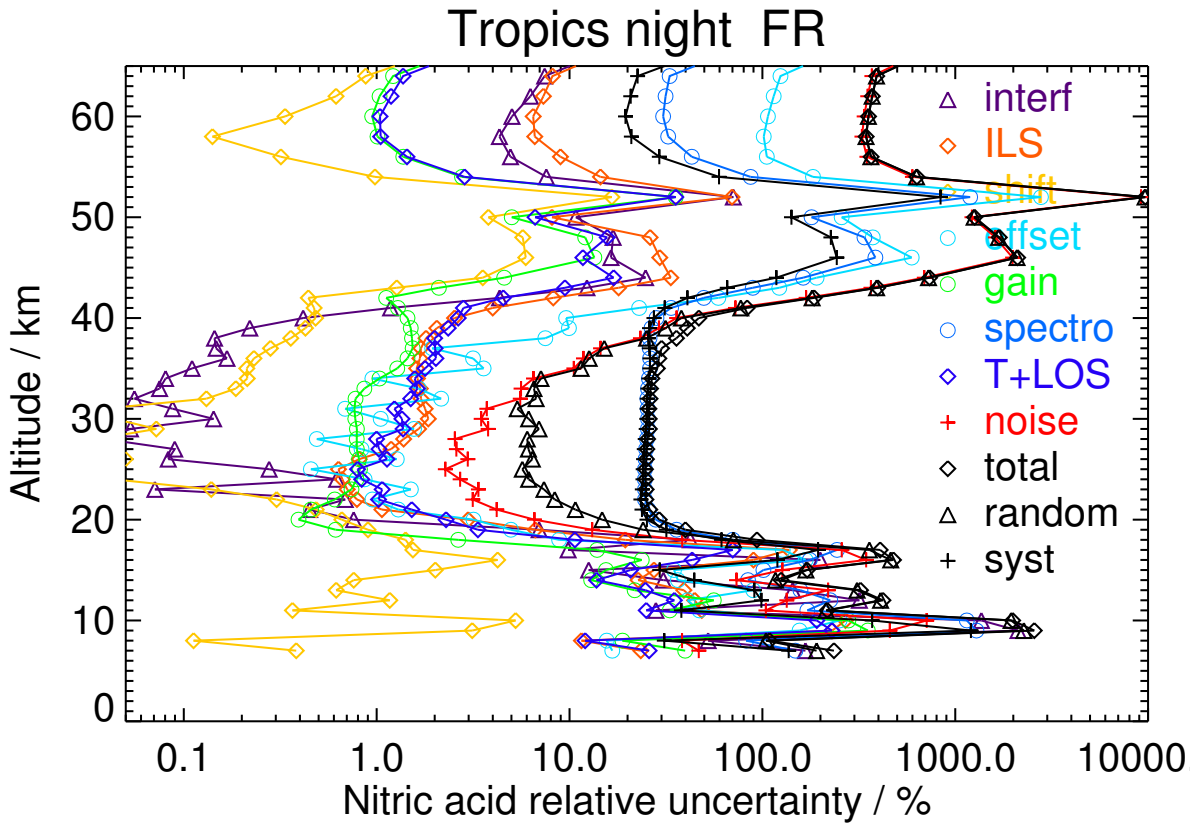


Figure S18: V8H_HNO₃_61 Tropics night

Table S23: HNO₃ error budget for Southern midlatitude winter day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.23	23.15	19.58	3.90	29.00	28.61	> 100	21.54	72.49	> 100	> 100	> 100
8	0.25	6.63	19.17	2.28	16.34	9.63	93.34	11.73	42.19	78.82	72.07	> 100
11	1.86	0.68	3.29	0.18	1.56	1.43	26.96	2.38	4.32	15.88	22.69	27.69
14	2.33	0.42	1.90	0.09	0.88	1.27	31.53	1.55	3.10	20.24	24.55	31.82
17	4.52	0.14	2.29	0.15	0.55	0.79	25.34	1.54	1.70	8.79	24.01	25.56
20	7.93	0.05	0.69	0.15	0.39	0.59	23.28	0.77	1.19	3.66	23.06	23.35
23	9.75	0.03	0.79	0.20	0.30	0.77	23.55	0.83	1.14	2.68	23.47	23.62
26	9.38	0.02	1.19	0.22	0.31	1.06	24.45	1.20	1.33	3.63	24.31	24.58
29	6.20	0.02	2.02	0.13	0.52	1.16	26.61	1.95	2.18	6.45	26.09	26.88
32	3.27	0.03	2.90	0.23	0.93	1.03	27.54	2.59	4.62	7.83	27.12	28.23
35	1.52	0.06	3.22	0.43	1.91	1.02	28.24	2.76	11.29	14.14	27.35	30.79
38	0.69	0.18	3.30	0.65	4.81	1.04	30.12	2.73	28.52	33.00	25.97	41.99
41	0.34	0.55	3.81	0.99	17.34	0.90	34.14	3.32	62.11	68.84	24.75	73.16

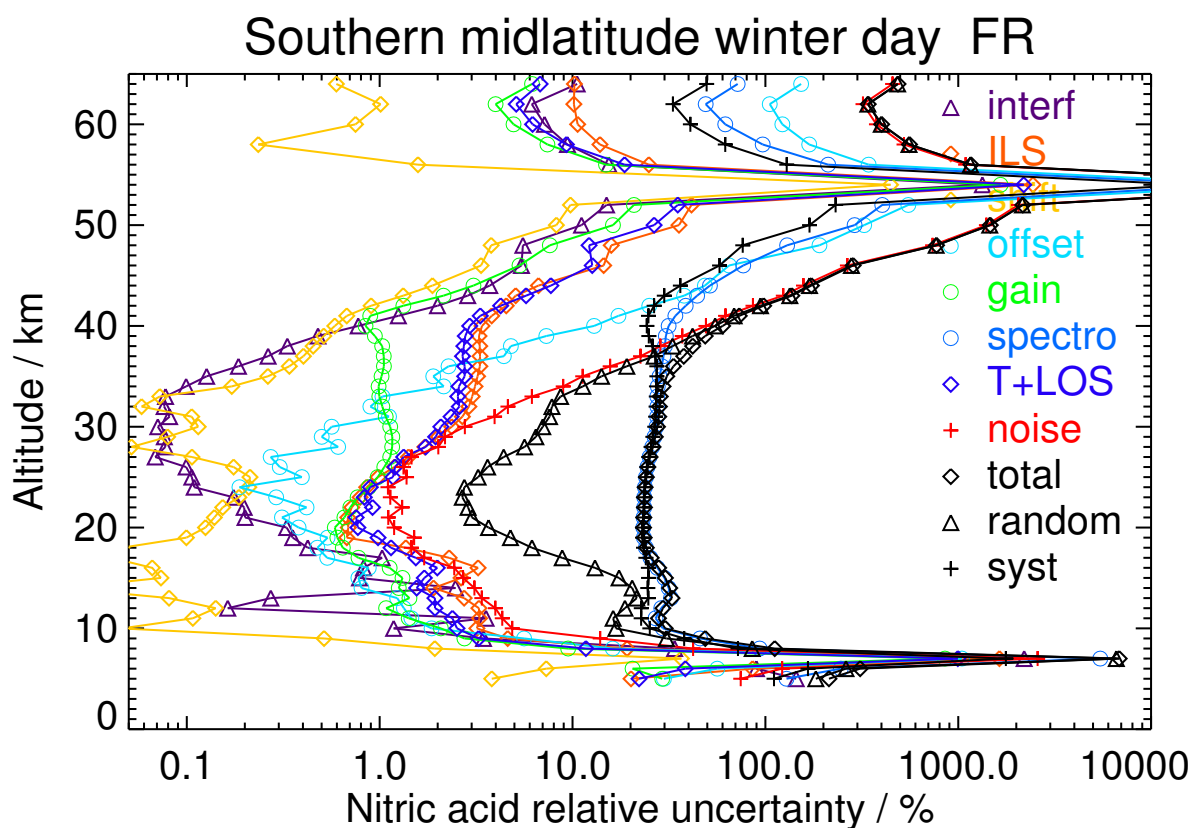


Figure S19: V8H_HNO₃.61 Southern midlatitude winter day

Table S24: HNO₃ error budget for Southern midlatitude winter night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.10	28.90	63.37	7.07	58.15	41.04	> 100	54.25	> 100	> 100	> 100	> 100
8	0.21	12.67	19.37	1.85	20.21	14.73	> 100	16.07	53.50	> 100	> 100	> 100
11	1.54	0.82	2.33	0.17	1.99	1.91	20.83	2.71	5.84	12.42	18.30	22.11
14	1.90	0.50	2.50	0.16	1.15	1.29	24.95	1.76	3.94	15.50	20.26	25.51
17	4.42	0.16	2.51	0.17	0.62	0.73	22.74	1.46	1.78	7.63	21.71	23.02
20	7.90	0.05	0.80	0.15	0.42	0.70	21.23	0.83	1.18	4.22	20.89	21.31
23	9.85	0.02	0.66	0.17	0.29	0.72	22.02	0.78	1.08	3.02	21.87	22.08
26	9.36	0.02	1.10	0.17	0.29	1.04	23.70	1.17	1.28	3.88	23.50	23.81
29	5.94	0.01	1.99	0.14	0.56	1.11	26.35	1.94	2.17	6.45	25.82	26.61
32	3.23	0.03	2.67	0.23	1.03	0.93	27.21	2.36	4.54	8.25	26.60	27.85
35	1.58	0.06	3.35	0.45	2.21	0.83	27.85	2.55	10.84	14.22	26.73	30.28
38	0.72	0.17	3.88	0.75	4.79	0.89	29.80	2.58	27.00	32.54	24.58	40.78
41	0.30	0.57	5.80	1.10	19.06	0.60	34.26	3.03	70.30	78.13	20.48	80.77

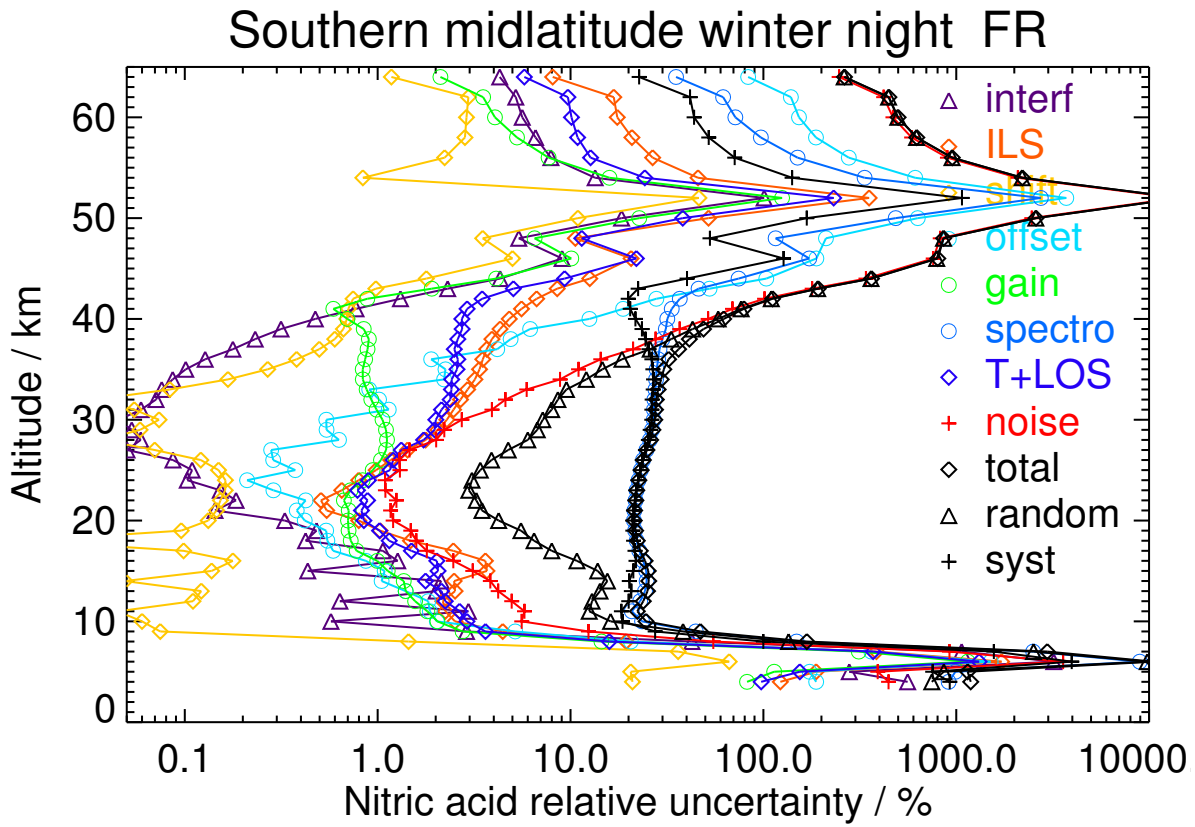


Figure S20: V8H_HNO₃_61 Southern midlatitude winter night

Table S25: HNO₃ error budget for Southern midlatitude spring day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.12	16.02	52.65	5.10	30.04	22.93	> 100	25.35	68.37	> 100	> 100	> 100
11	1.44	0.89	3.25	0.23	2.01	1.93	23.06	2.98	4.87	13.88	19.77	24.16
14	2.24	0.54	2.49	0.20	1.11	0.99	26.97	1.89	3.08	13.86	23.60	27.37
17	4.68	0.14	3.78	0.22	0.73	0.98	22.97	1.72	1.67	9.07	21.61	23.44
20	7.59	0.06	1.21	0.26	0.48	0.88	22.05	0.92	1.17	6.32	21.24	22.16
23	8.43	0.02	0.89	0.17	0.41	0.97	22.53	1.05	1.12	3.92	22.28	22.62
26	7.16	0.02	1.24	0.13	0.50	1.10	23.95	1.35	1.38	4.20	23.72	24.09
29	5.03	0.01	1.79	0.15	0.79	1.01	25.22	1.65	2.13	5.87	24.78	25.46
32	3.01	0.02	2.33	0.23	1.42	0.92	26.76	2.03	4.17	9.29	25.69	27.32
35	1.40	0.06	3.27	0.24	3.19	0.77	28.42	2.57	10.25	15.58	26.42	30.67
38	0.49	0.19	3.21	0.28	8.47	1.35	28.79	3.08	34.04	37.78	25.57	45.62
41	0.18	0.78	3.12	0.52	30.91	1.44	34.19	3.00	> 100	> 100	23.28	> 100

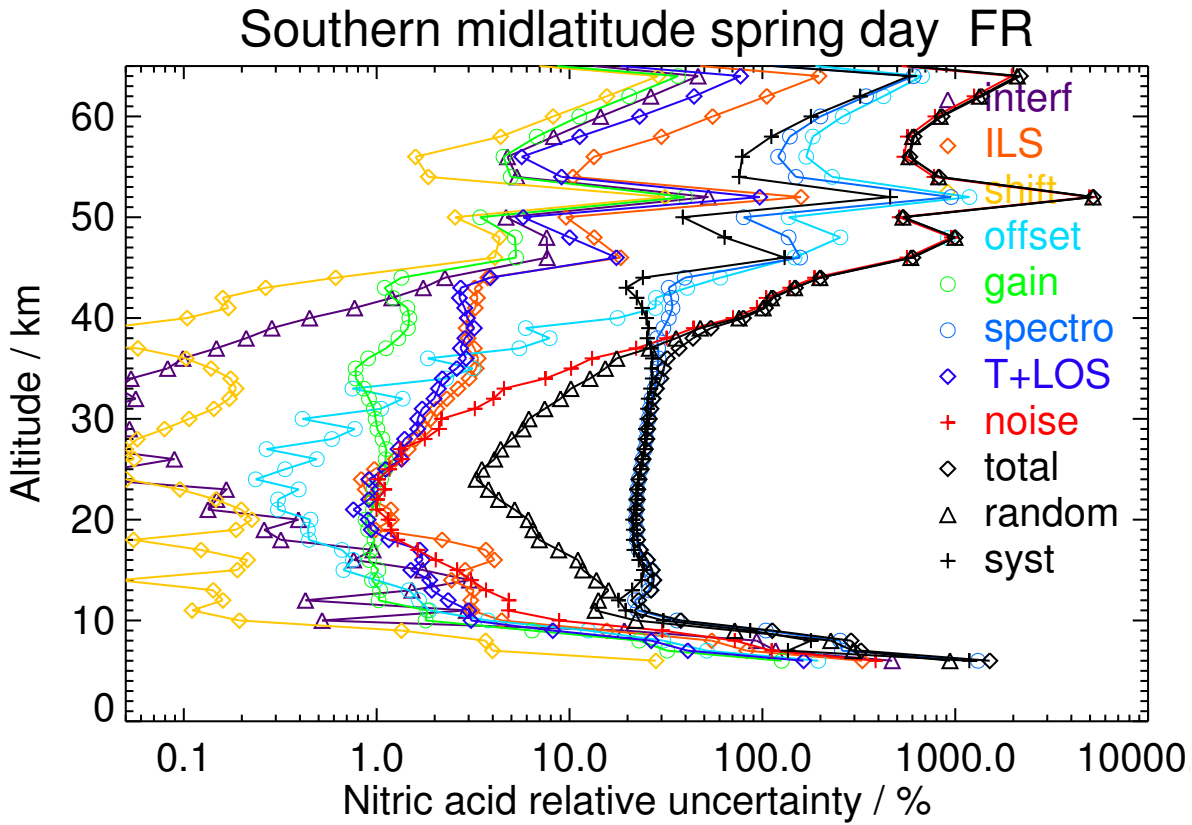


Figure S21: V8H_HNO₃_61 Southern midlatitude spring day

Table S26: HNO₃ error budget for Southern midlatitude spring night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.18	13.31	35.05	3.62	22.82	13.28	> 100	16.04	55.73	94.16	> 100	> 100
11	1.70	0.93	2.46	0.21	1.69	1.59	23.38	2.35	4.35	10.91	21.55	24.15
14	2.31	0.71	2.24	0.19	1.01	0.89	27.92	1.59	2.99	11.71	25.72	28.26
17	5.19	0.18	3.08	0.24	0.61	0.50	23.52	1.44	1.40	6.10	23.03	23.82
20	7.58	0.07	1.34	0.25	0.41	0.79	23.15	0.81	1.07	4.07	22.88	23.24
23	8.49	0.03	0.76	0.10	0.39	0.94	23.46	0.95	1.04	3.08	23.34	23.54
26	7.07	0.02	1.37	0.10	0.51	1.20	24.61	1.28	1.32	3.99	24.43	24.76
29	5.20	0.02	1.53	0.07	0.79	1.04	25.15	1.50	2.06	4.52	24.96	25.36
32	3.59	0.02	2.08	0.11	1.26	0.97	25.81	1.80	3.51	5.96	25.55	26.24
35	1.79	0.04	2.98	0.22	2.67	0.91	27.73	2.46	8.39	11.15	27.17	29.36
38	0.65	0.14	3.46	0.32	6.92	1.30	28.76	3.05	26.94	29.49	27.46	40.30
41	0.21	0.64	2.84	0.43	28.54	1.14	31.19	3.53	93.60	99.77	24.84	> 100

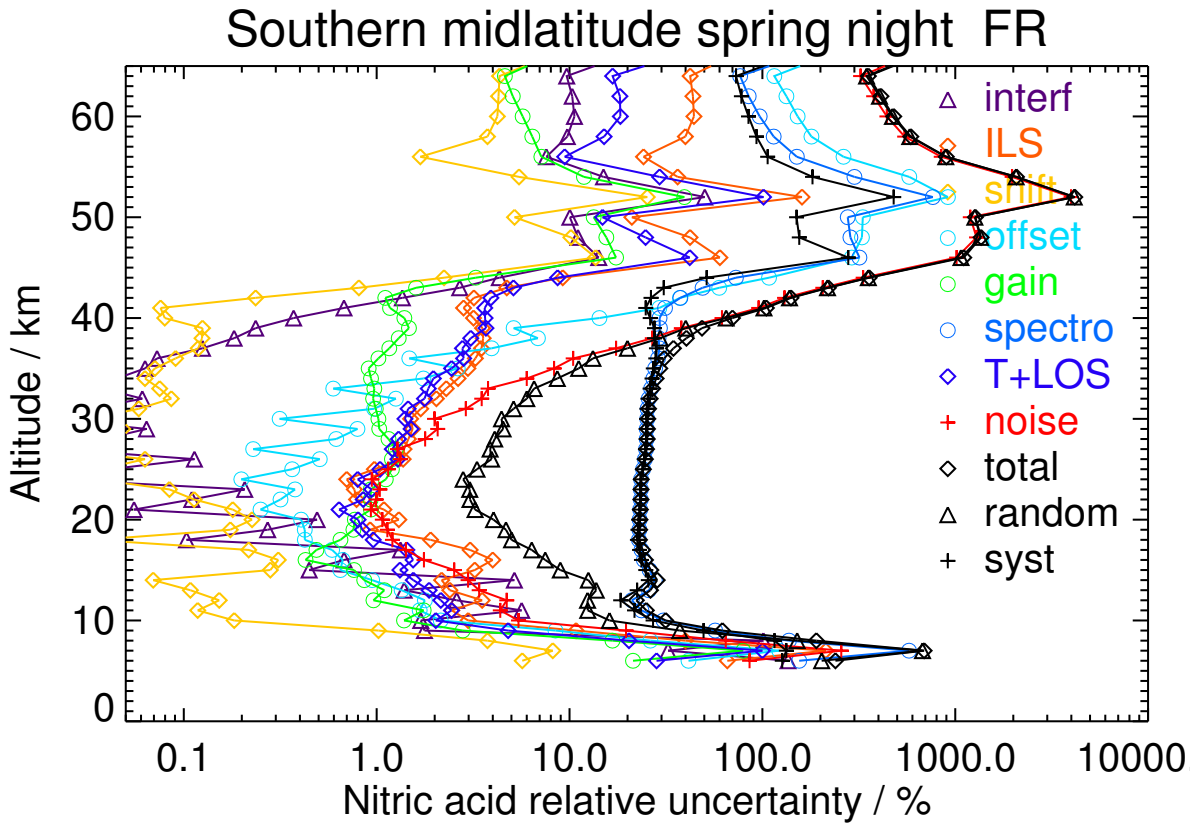


Figure S22: V8H_HNO₃_61 Southern midlatitude spring night

Table S27: HNO₃ error budget for Southern midlatitude summer day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.32	22.90	18.73	2.84	22.52	29.43	> 100	29.85	53.99	> 100	> 100	> 100
8	-0.04	95.37	81.01	11.10	> 100	> 100	> 100	> 100	> 100	> 100	> 100	> 100
11	1.28	1.44	2.08	0.27	2.20	3.02	23.82	3.34	6.80	12.48	22.13	25.41
14	1.43	1.01	2.40	0.16	1.21	1.73	26.06	1.59	4.88	12.98	23.41	26.77
17	3.09	0.24	2.95	0.08	0.58	0.49	23.31	1.37	2.13	6.67	22.69	23.64
20	6.32	0.06	0.80	0.21	0.40	0.68	22.02	0.73	1.15	3.78	21.77	22.09
23	8.37	0.02	0.71	0.08	0.27	0.91	22.28	0.71	0.98	2.29	22.23	22.35
26	7.18	0.01	1.17	0.17	0.29	1.21	24.00	1.19	1.19	2.23	24.02	24.12
29	5.03	0.01	1.85	0.05	0.44	0.99	24.97	1.63	1.82	2.94	25.00	25.18
32	2.77	0.03	2.73	0.21	0.82	0.85	26.05	2.23	3.77	4.91	26.13	26.59
35	1.28	0.06	2.28	0.39	2.01	0.87	26.17	2.66	9.68	10.59	26.15	28.21
38	0.60	0.15	1.60	0.36	4.39	1.51	24.71	2.35	24.59	25.58	24.32	35.29
41	0.21	0.68	2.46	0.70	22.51	1.55	29.89	2.91	78.17	82.64	26.42	86.76

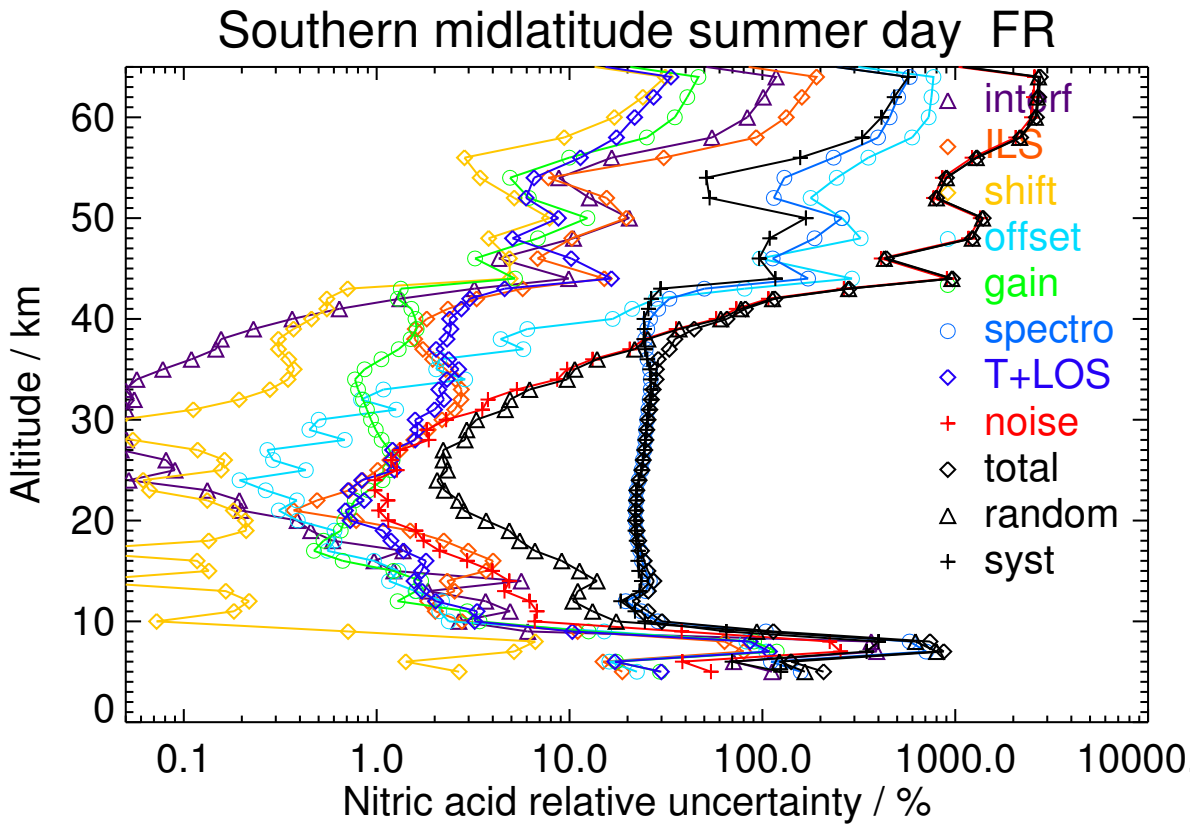


Figure S23: V8H_HNO₃_61 Southern midlatitude summer day

Table S28: HNO₃ error budget for Southern midlatitude summer night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.35	20.34	18.81	2.31	19.95	19.73	79.79	16.34	50.64	76.60	69.93	> 100
8	0.21	21.33	36.88	2.54	24.99	14.44	> 100	14.61	63.40	> 100	54.02	> 100
11	0.89	2.60	3.54	0.40	3.81	2.34	32.10	2.88	11.27	22.26	26.64	34.72
14	1.10	1.10	4.31	0.18	2.29	1.93	27.06	2.09	7.09	16.31	23.44	28.55
17	2.57	0.30	3.47	0.09	0.79	0.44	26.36	1.47	2.76	8.15	25.52	26.79
20	5.80	0.06	0.93	0.23	0.43	0.55	23.56	0.78	1.26	4.34	23.23	23.64
23	8.02	0.02	0.65	0.09	0.25	0.96	23.09	0.69	1.03	2.23	23.04	23.15
26	6.93	0.01	1.24	0.19	0.26	1.23	24.32	1.18	1.24	2.22	24.34	24.44
29	4.75	0.01	2.02	0.07	0.44	0.98	25.16	1.67	1.93	3.07	25.21	25.40
32	2.63	0.03	2.76	0.21	0.85	0.84	25.89	2.22	3.97	4.89	26.01	26.46
35	1.35	0.06	1.97	0.33	1.86	0.90	25.80	2.36	9.18	10.09	25.73	27.64
38	0.62	0.14	1.72	0.40	4.21	1.65	25.98	2.41	23.86	25.09	25.39	35.69
41	0.22	0.63	2.27	0.70	20.20	1.19	28.35	2.84	70.27	74.09	25.99	78.52

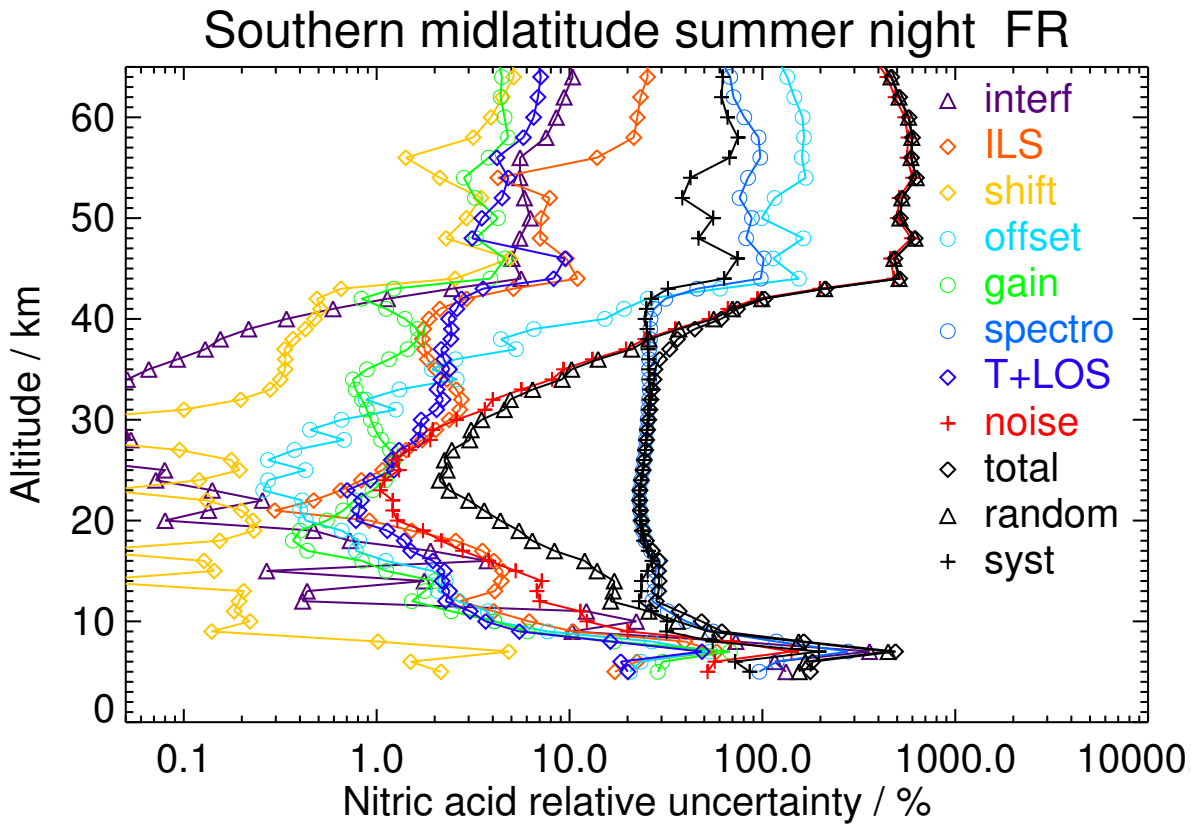


Figure S24: V8H_HNO3_61 Southern midlatitude summer night

Table S29: HNO₃ error budget for Southern midlatitude autumn day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	-0.00	> 100	> 100	> 100	> 100	> 100	> 100	> 100	> 100	> 100	> 100	> 100
8	0.18	18.34	29.80	2.60	21.86	12.62	> 100	12.49	47.17	> 100	31.72	> 100
11	0.68	2.25	3.60	0.53	4.55	2.00	31.89	3.38	10.99	22.61	26.09	34.52
14	1.24	0.44	7.03	0.45	2.46	0.95	31.12	3.04	5.60	22.06	24.07	32.65
17	3.81	0.16	2.51	0.18	0.88	0.37	26.41	1.42	2.04	12.88	23.35	26.66
20	7.85	0.03	0.61	0.17	0.50	0.53	23.36	0.83	1.13	6.77	22.42	23.42
23	10.59	0.02	0.52	0.12	0.31	0.92	22.96	0.80	0.92	3.41	22.76	23.02
26	9.45	< 0.01	1.17	0.07	0.31	1.11	24.27	1.12	1.10	3.00	24.19	24.37
29	6.62	0.01	1.88	0.09	0.55	1.07	25.33	1.53	1.78	3.32	25.32	25.54
32	3.60	0.02	2.44	0.14	1.09	0.98	26.90	2.04	3.75	5.60	26.80	27.38
35	1.66	0.05	2.47	0.35	2.26	1.20	27.20	2.45	9.51	11.49	26.78	29.14
38	0.55	0.19	3.09	0.47	7.84	1.69	30.04	3.31	33.21	35.42	28.90	45.72
41	0.18	0.94	4.38	0.44	30.12	1.02	32.84	3.44	> 100	> 100	26.34	> 100

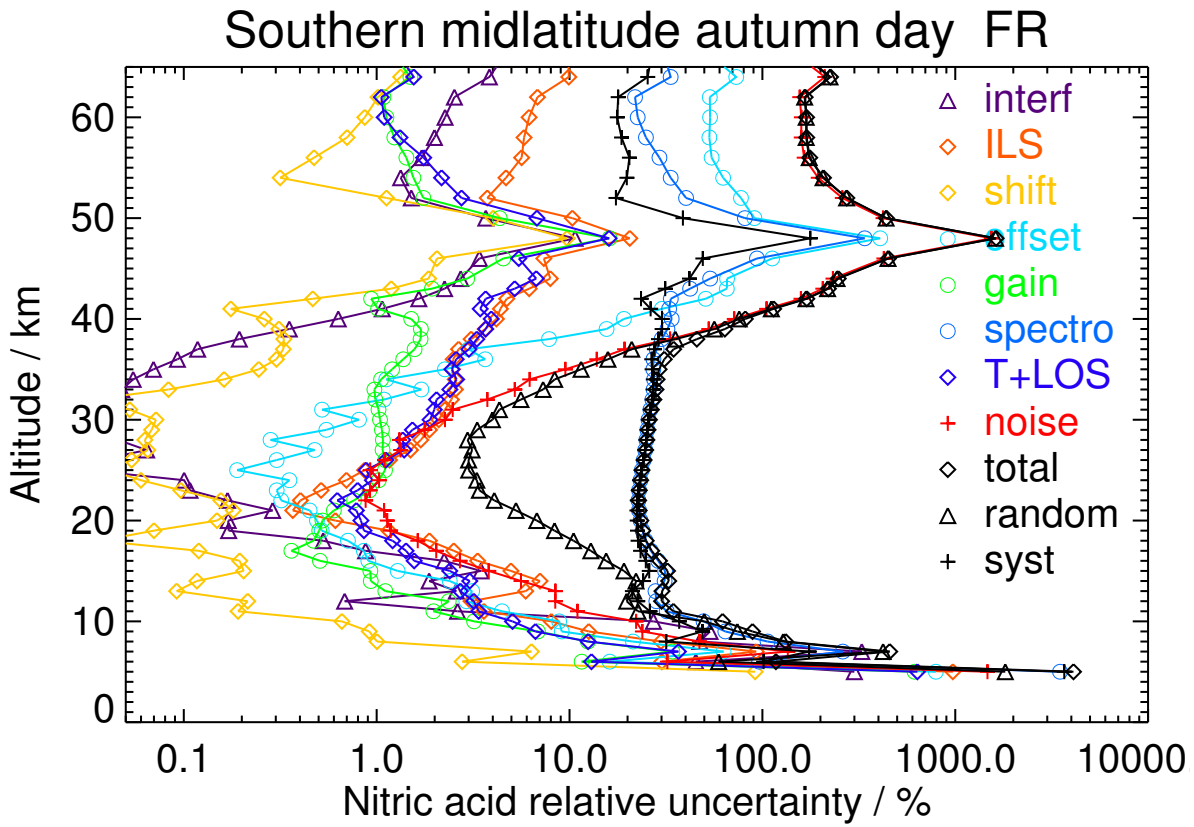


Figure S25: V8H.HNO₃.61 Southern midlatitude autumn day

Table S30: HNO₃ error budget for Southern midlatitude autumn night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.03	64.07	99.10	7.54	81.45	61.54	> 100	56.49	> 100	> 100	> 100	> 100
11	0.58	1.71	5.04	0.42	4.52	2.33	31.19	3.26	10.39	22.29	25.47	33.85
14	0.94	0.46	6.14	0.53	2.96	1.42	31.14	3.31	6.72	23.84	22.51	32.79
17	2.82	0.12	3.29	0.26	1.21	0.56	26.90	1.85	2.75	13.51	23.77	27.34
20	6.75	0.04	0.53	0.21	0.62	0.45	22.65	0.94	1.39	5.61	22.03	22.73
23	9.61	0.02	0.42	0.10	0.39	0.92	22.63	0.88	1.05	3.64	22.41	22.70
26	9.12	0.01	1.04	0.07	0.39	1.06	23.73	1.12	1.18	3.20	23.62	23.83
29	6.49	0.01	1.80	0.09	0.62	1.02	25.28	1.49	1.85	4.06	25.15	25.48
32	3.58	0.02	2.37	0.17	1.17	0.88	26.94	1.97	3.82	6.57	26.63	27.43
35	1.61	0.05	2.43	0.33	2.39	1.20	27.70	2.43	9.69	11.92	27.17	29.67
38	0.62	0.17	2.60	0.41	6.66	1.57	27.17	2.90	28.74	30.45	26.45	40.33
41	0.14	1.16	5.43	0.63	34.12	1.49	39.12	4.58	> 100	> 100	29.51	> 100

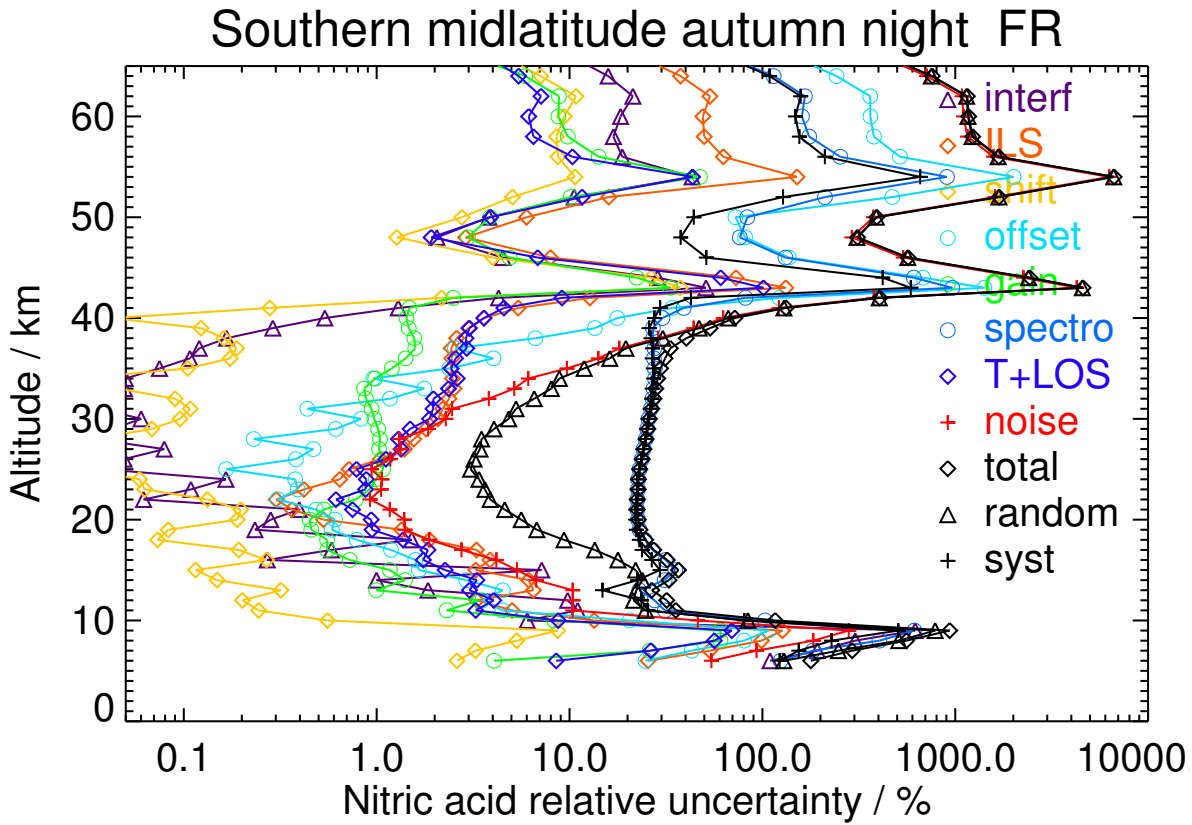


Figure S26: V8H_HNO₃_61 Southern midlatitude autumn night

Table S31: HNO₃ error budget for Southern polar winter day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.13	26.47	37.21	8.23	56.04	8.41	> 100	29.48	> 100	> 100	> 100	> 100
8	1.00	2.40	6.88	0.84	5.54	3.10	37.28	5.16	12.06	25.92	31.38	40.70
11	2.34	0.48	1.48	0.22	1.17	0.74	26.34	2.10	3.57	9.02	25.18	26.75
14	3.49	0.12	1.95	0.28	0.64	1.47	25.71	2.27	2.36	11.68	23.28	26.04
17	3.83	0.10	1.38	0.32	0.63	1.66	30.45	2.34	2.53	19.31	23.91	30.73
20	5.62	0.03	1.40	0.45	0.65	0.92	27.81	1.56	2.12	14.24	24.10	27.99
23	8.21	0.02	1.08	0.37	0.44	0.71	24.20	1.10	1.77	7.43	23.17	24.33
26	7.18	0.01	1.68	0.19	0.44	0.91	24.88	1.63	2.18	4.81	24.64	25.11
29	4.62	0.02	2.10	0.21	0.66	0.87	27.01	1.96	3.47	7.54	26.35	27.40
32	3.97	0.02	2.22	0.14	0.71	0.69	26.33	1.46	4.41	11.59	24.22	26.85
35	2.76	0.04	3.92	0.23	1.10	0.51	28.41	1.78	6.98	15.27	25.35	29.59
38	1.25	0.12	5.88	0.95	2.94	0.46	31.84	2.61	16.86	23.15	28.52	36.73
41	0.42	0.49	6.95	2.06	15.47	1.05	36.18	4.02	53.55	59.40	30.96	66.98

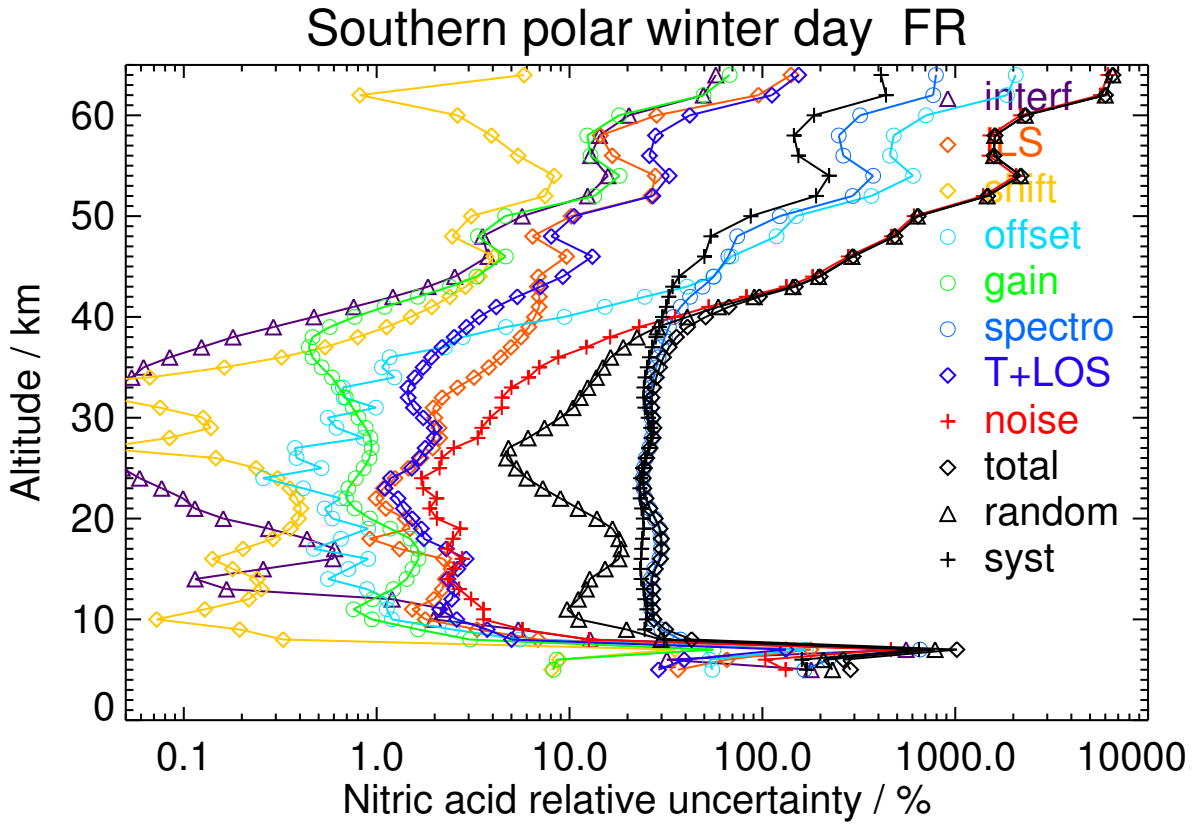


Figure S27: V8H_HNO₃_61 Southern polar winter day

Table S32: HNO₃ error budget for Southern polar winter night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	-0.50	2.70	11.48	1.70	10.93	3.40	93.29	8.18	23.38	50.45	83.93	97.92
8	0.47	2.69	12.66	1.12	10.30	5.21	85.86	10.06	22.57	83.78	35.59	91.02
11	2.45	0.28	2.10	0.20	1.40	0.89	21.43	2.67	3.62	11.55	18.79	22.06
14	4.81	0.11	2.22	0.13	0.64	1.16	20.43	2.05	1.89	8.43	18.99	20.78
17	6.80	0.07	1.14	0.14	0.48	1.31	21.06	1.71	1.54	10.56	18.45	21.26
20	7.45	0.03	1.01	0.25	0.48	0.94	24.04	1.25	1.68	11.97	21.00	24.17
23	9.48	0.02	0.93	0.33	0.40	0.64	23.57	1.09	1.56	8.07	22.26	23.68
26	9.82	0.01	1.61	0.24	0.35	0.83	23.64	1.37	1.72	5.66	23.13	23.81
29	5.06	0.02	3.39	0.13	0.78	1.03	29.83	2.55	3.45	7.74	29.35	30.35
32	3.99	0.03	2.12	0.13	0.82	0.77	27.23	1.50	4.65	11.33	25.36	27.77
35	4.24	0.03	2.47	0.22	0.82	0.62	25.60	1.10	4.78	13.78	22.29	26.20
38	2.85	0.06	3.94	0.72	1.47	0.51	29.79	1.62	7.71	19.68	24.09	31.11
41	1.29	0.16	6.21	1.45	5.37	0.41	39.28	2.46	18.33	34.64	27.46	44.21

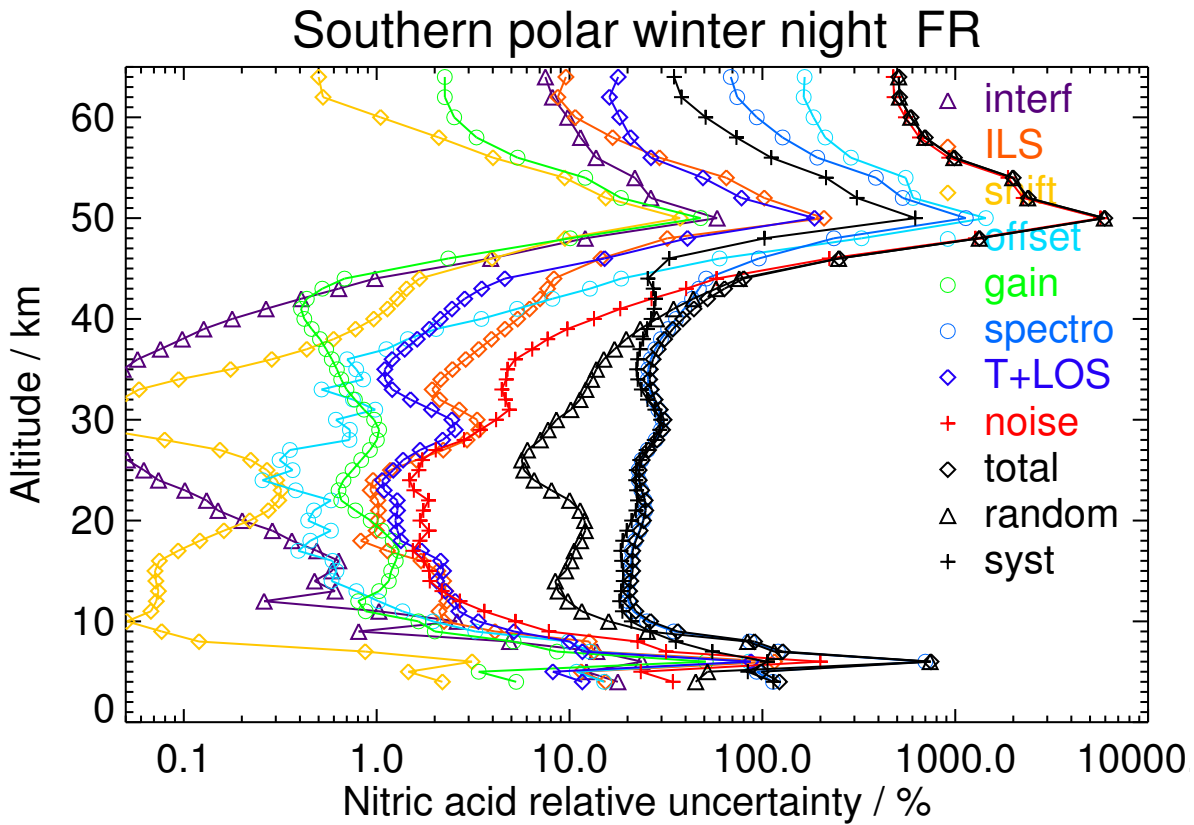


Figure S28: V8H_HNO₃_61 Southern polar winter night

Table S33: HNO₃ error budget for Southern polar spring day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	-0.05	41.62	59.57	5.99	69.05	34.07	> 100	49.76	> 100	> 100	> 100	> 100
11	1.54	0.44	6.52	0.35	1.72	1.67	22.78	2.99	5.12	8.12	23.17	24.55
14	1.60	0.48	6.90	0.49	1.60	1.11	27.02	3.52	4.72	9.96	26.78	28.57
17	0.72	0.66	6.95	1.86	4.33	2.28	31.01	6.91	11.89	26.00	23.48	35.03
20	2.69	0.10	6.87	1.41	1.72	1.57	26.44	3.27	3.39	8.71	26.46	27.86
23	7.40	0.02	0.55	0.34	0.53	0.82	22.83	1.18	1.24	3.90	22.59	22.93
26	6.18	0.01	2.53	0.52	0.63	1.07	25.19	1.91	1.51	4.92	24.98	25.46
29	2.69	0.02	4.05	0.52	1.64	0.80	27.22	2.66	3.76	9.88	26.17	27.97
32	1.40	0.05	3.09	0.32	3.37	1.02	26.63	1.97	8.49	13.65	24.92	28.41
35	0.67	0.12	3.08	0.24	7.57	0.94	28.35	2.14	20.59	24.94	26.03	36.05
38	0.29	0.32	2.65	0.33	17.78	1.54	29.75	2.08	56.38	61.10	25.71	66.29
41	0.15	0.86	3.11	0.32	39.20	1.61	35.04	1.97	> 100	> 100	26.19	> 100

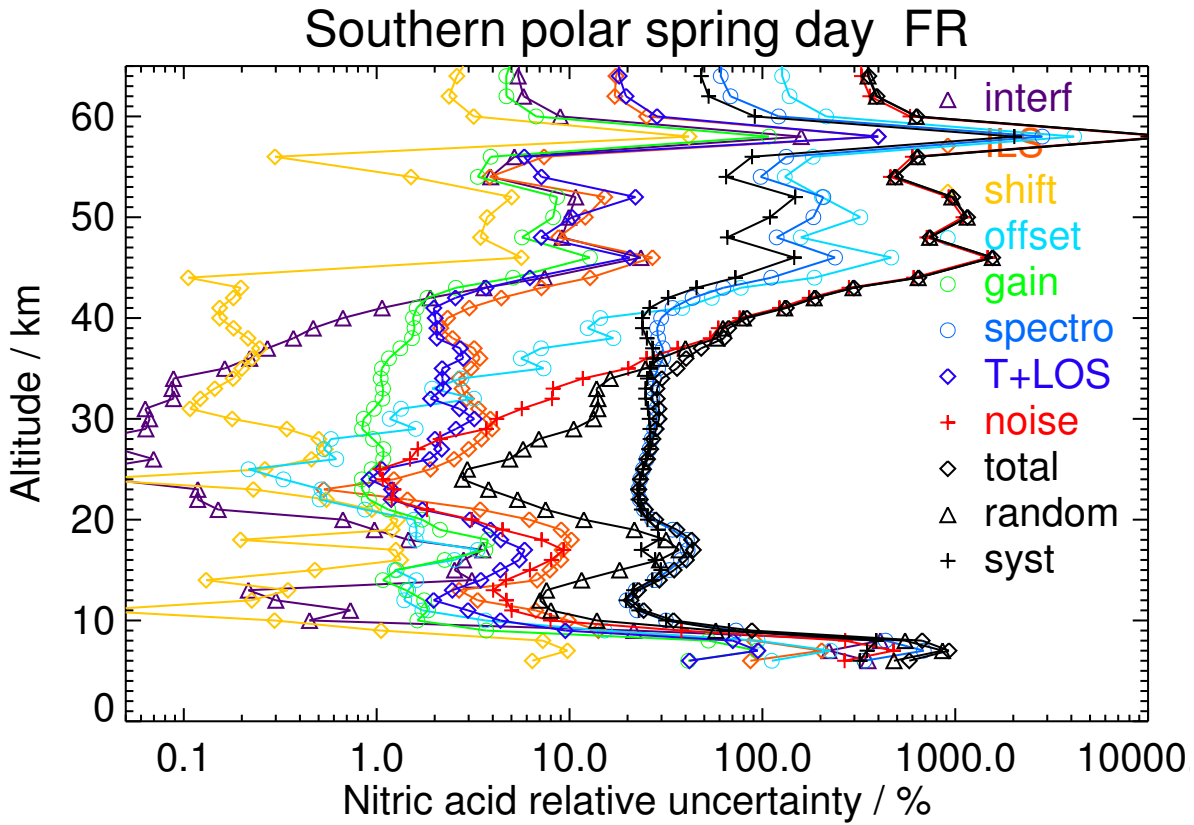


Figure S29: V8H_HNO₃_61 Southern polar spring day

Table S34: HNO₃ error budget for Southern polar spring night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.18	10.69	20.64	2.20	20.62	10.96	> 100	13.66	56.51	80.01	98.71	> 100
11	1.61	0.51	3.69	0.25	1.67	0.68	21.07	2.84	5.00	8.43	20.57	22.23
14	2.46	0.39	4.27	0.47	0.98	0.95	24.65	2.32	3.06	11.63	22.53	25.35
17	3.59	0.17	4.45	0.63	0.98	1.06	28.43	1.88	2.28	20.34	20.63	28.97
20	4.40	0.07	3.64	0.84	0.85	1.40	29.49	1.72	2.03	19.09	23.00	29.89
23	6.75	0.02	0.75	0.43	0.63	1.01	23.54	1.11	1.42	5.53	23.00	23.66
26	6.30	0.02	1.74	0.35	0.65	1.07	24.74	1.53	1.60	4.35	24.55	24.93
29	3.98	0.02	2.73	0.36	1.16	0.98	26.13	2.16	2.77	7.98	25.32	26.55
32	1.85	0.04	3.74	0.41	2.62	1.09	30.46	2.63	6.77	17.43	26.43	31.66
35	0.77	0.10	3.53	0.23	6.54	1.50	33.21	2.45	18.65	28.98	25.97	38.91
38	0.32	0.29	3.22	0.23	15.55	1.60	32.53	2.30	52.34	58.35	25.55	63.70
41	0.11	1.25	5.69	0.72	53.95	1.60	42.58	3.23	> 100	> 100	33.21	> 100

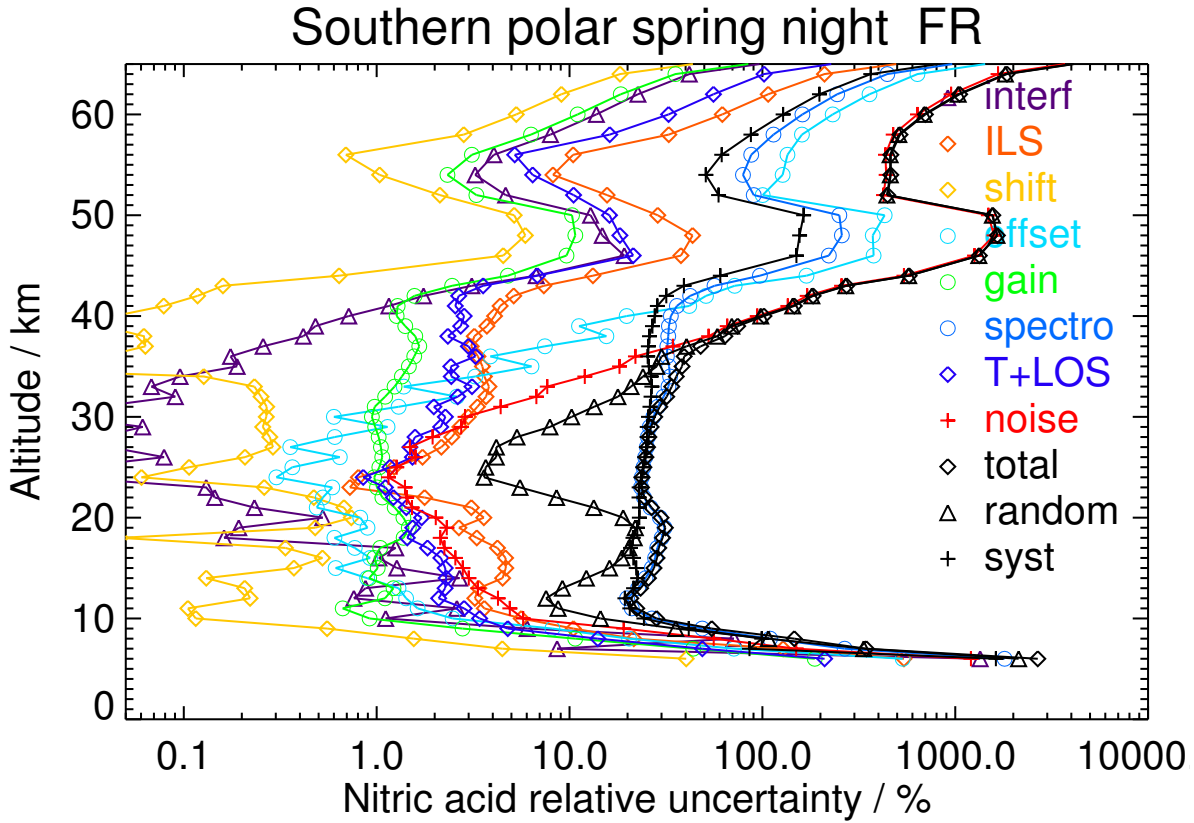


Figure S30: V8H.HNO3.61 Southern polar spring night

Table S35: HNO₃ error budget for Southern polar summer day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.18	22.27	48.45	6.41	38.08	18.29	> 100	31.51	87.74	> 100	> 100	> 100
8	0.24	8.46	22.47	3.14	19.16	7.32	> 100	13.28	50.08	74.76	> 100	> 100
11	1.45	1.03	2.47	0.34	1.90	1.20	18.59	2.79	5.68	9.70	17.43	19.94
14	1.75	0.75	1.86	0.16	0.88	1.00	26.69	1.34	3.93	9.23	25.50	27.12
17	3.98	0.19	3.00	0.08	0.51	0.36	22.87	1.28	1.65	3.87	22.85	23.17
20	7.04	0.06	0.55	0.24	0.35	0.66	22.11	0.60	1.01	2.02	22.07	22.16
23	8.49	0.03	0.73	0.08	0.27	0.91	22.76	0.71	0.93	1.52	22.77	22.82
26	7.55	0.02	1.19	0.20	0.33	1.26	23.96	1.14	1.13	1.98	24.00	24.08
29	5.32	0.01	1.83	0.10	0.55	1.01	24.94	1.66	1.74	2.94	24.98	25.15
32	3.08	0.02	2.83	0.15	1.06	0.80	25.50	2.18	3.49	4.77	25.58	26.02
35	1.42	0.05	2.34	0.40	2.65	0.83	26.01	2.56	9.07	10.29	25.93	27.90
38	0.65	0.14	1.47	0.51	5.99	1.66	24.74	2.31	23.79	25.27	24.21	34.99
41	0.25	0.51	1.55	0.87	20.85	1.53	26.11	2.58	68.76	72.93	23.19	76.53

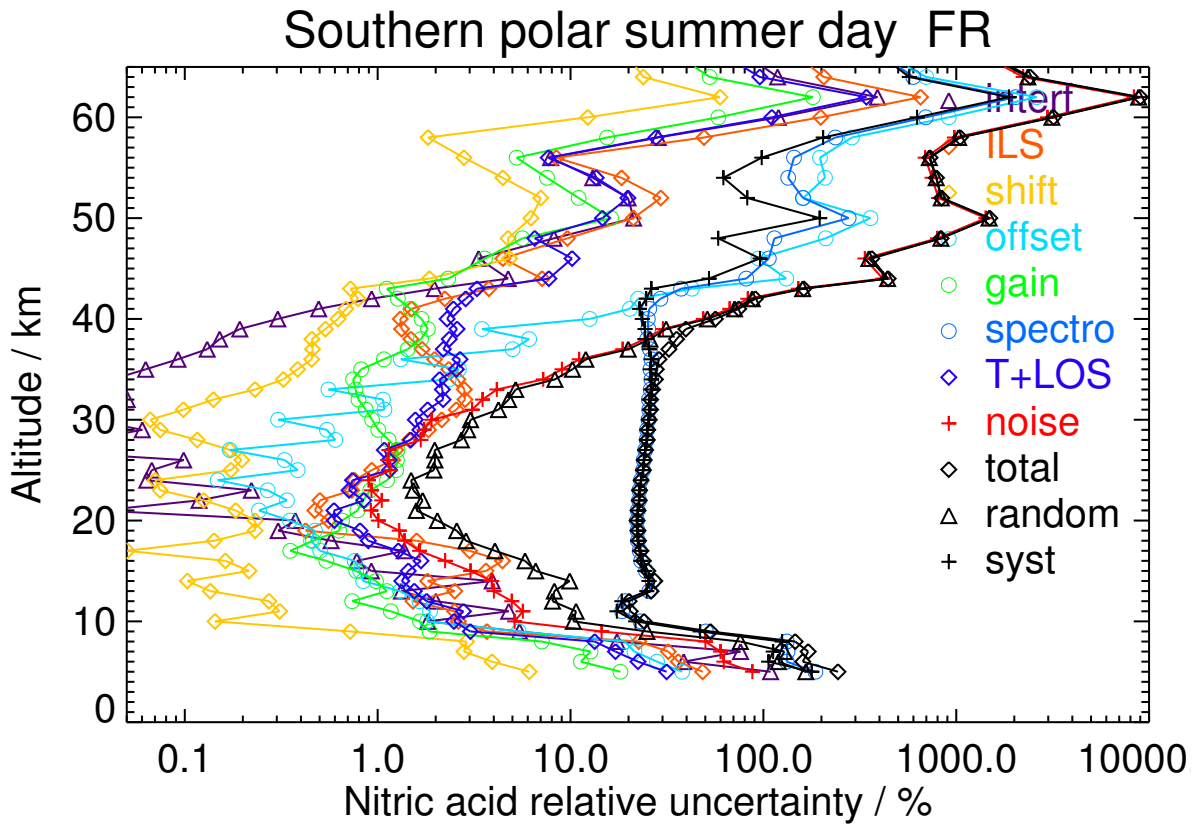


Figure S31: V8H_HNO₃_61 Southern polar summer day

Table S36: HNO₃ error budget for Southern polar summer night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.46	10.56	15.26	1.54	9.34	4.23	53.02	4.22	25.57	44.35	44.36	62.72
11	1.08	2.49	2.60	0.48	2.56	0.62	25.82	2.55	8.79	13.89	24.03	27.75
14	1.52	0.73	4.54	0.23	1.51	0.89	24.46	1.82	5.13	10.01	23.50	25.54
17	4.06	0.24	2.14	0.06	0.57	0.25	23.54	1.09	1.76	3.79	23.43	23.73
20	7.68	0.04	0.19	0.13	0.31	0.62	22.13	0.57	0.97	2.23	22.06	22.17
23	9.20	0.02	0.62	0.07	0.18	1.01	22.73	0.63	0.89	1.60	22.73	22.79
26	8.16	< 0.01	0.94	0.10	0.15	1.23	23.89	0.96	1.07	1.97	23.90	23.98
29	5.72	0.01	1.80	0.07	0.27	1.04	25.22	1.48	1.65	2.83	25.25	25.40
32	3.16	0.02	2.65	0.19	0.51	0.86	26.23	2.16	3.44	4.71	26.28	26.70
35	1.45	0.05	2.47	0.28	1.27	0.95	26.63	2.69	8.91	9.83	26.60	28.36
38	0.65	0.14	1.83	0.30	3.11	1.55	25.79	2.55	23.94	25.11	25.10	35.50
41	0.21	0.77	2.83	0.60	21.39	1.32	28.96	3.32	79.49	83.72	25.06	87.39

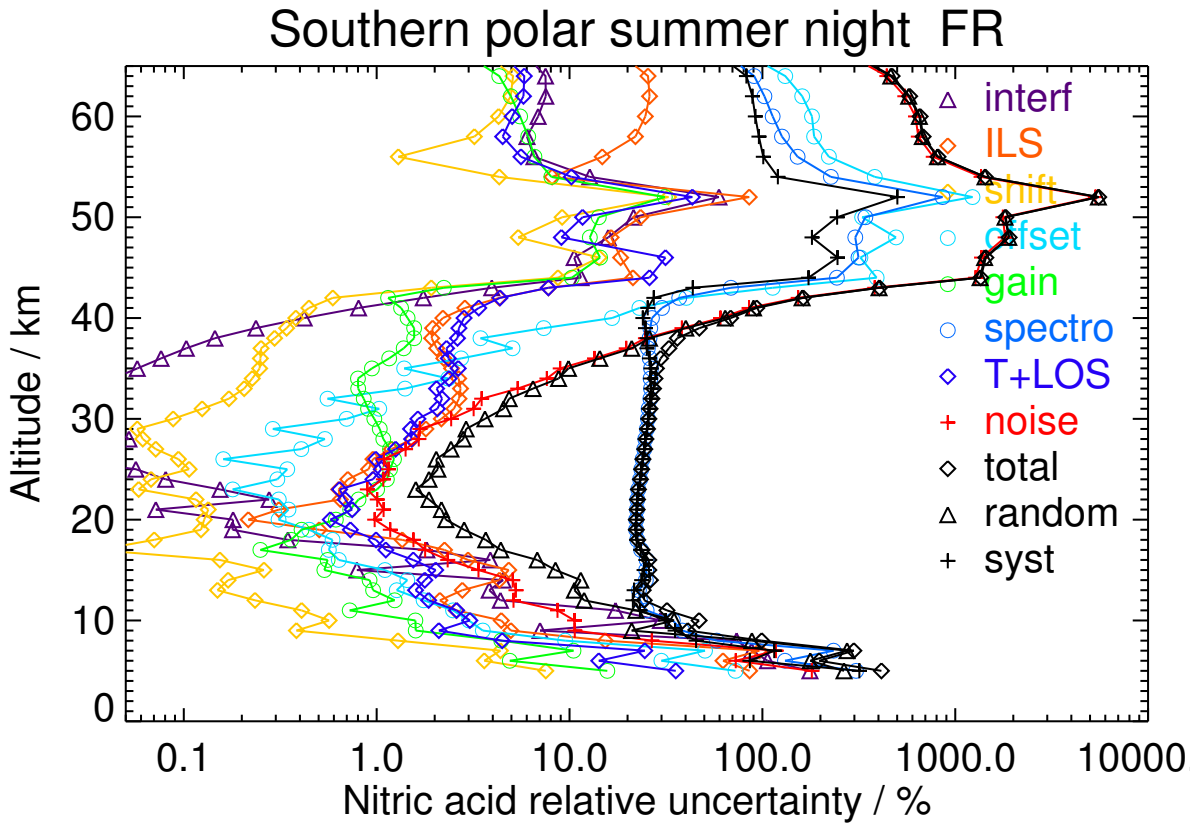


Figure S32: V8H_HNO₃.61 Southern polar summer night

Table S37: HNO₃ error budget for Southern polar autumn day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	-0.04	25.04	81.85	9.48	83.97	37.72	> 100	41.32	> 100	> 100	> 100	> 100
8	0.56	2.65	5.43	0.86	5.88	2.43	39.15	3.23	13.70	25.77	33.83	42.53
11	1.12	0.85	1.90	0.37	2.46	1.20	23.59	2.19	5.74	11.12	21.97	24.62
14	2.46	0.13	4.55	0.28	1.24	0.58	25.75	2.34	3.07	7.54	25.37	26.47
17	6.97	0.09	1.43	0.06	0.68	0.19	22.65	1.14	1.38	3.95	22.43	22.78
20	11.83	0.02	0.25	0.14	0.40	0.57	22.30	0.72	0.95	2.33	22.23	22.35
23	13.17	0.02	0.74	0.19	0.25	0.98	23.20	0.86	0.91	1.93	23.19	23.27
26	10.91	< 0.01	1.19	0.09	0.29	1.14	24.52	1.20	1.15	2.29	24.53	24.63
29	7.24	0.01	1.88	0.07	0.56	1.06	25.89	1.72	1.89	3.15	25.92	26.11
32	3.54	0.02	2.94	0.21	1.11	1.01	28.02	2.50	4.34	5.79	28.06	28.66
35	1.23	0.08	4.12	0.61	2.71	1.16	30.21	3.57	14.36	16.11	29.96	34.02
38	0.33	0.38	5.03	0.78	12.76	1.39	31.62	4.79	60.89	64.03	28.66	70.15
41	0.07	2.51	4.83	1.81	84.28	1.84	53.53	8.56	> 100	> 100	32.96	> 100

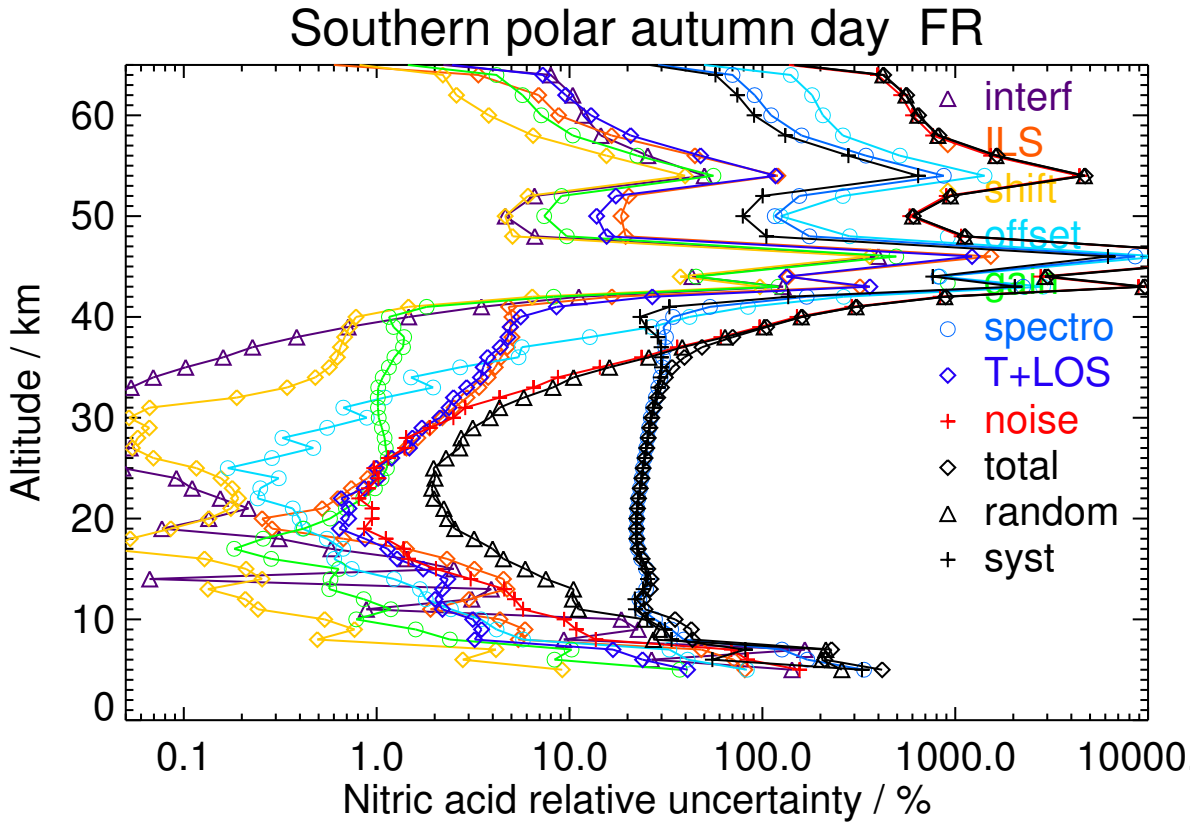


Figure S33: V8H.HNO₃.61 Southern polar autumn day

Table S38: HNO₃ error budget for Southern polar autumn night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.01	> 100	> 100	82.68	> 100	> 100	> 100	> 100	> 100	> 100	> 100	> 100
8	0.40	6.12	11.84	1.09	10.00	3.69	77.58	5.94	22.56	58.09	59.00	82.80
11	1.11	1.03	2.77	0.31	2.70	0.80	18.87	2.43	6.47	12.57	16.21	20.51
14	2.38	0.21	4.16	0.27	1.27	0.43	24.71	2.27	3.28	9.42	23.60	25.41
17	6.84	0.10	1.80	0.10	0.63	0.29	21.63	1.24	1.37	4.24	21.38	21.80
20	12.02	0.03	0.22	0.12	0.40	0.56	21.21	0.69	0.92	3.18	21.02	21.26
23	13.58	0.02	0.76	0.24	0.22	0.87	22.59	0.81	0.91	2.72	22.49	22.66
26	11.75	0.01	1.05	0.16	0.21	1.07	23.93	1.11	1.11	3.03	23.84	24.03
29	7.84	0.01	1.85	0.07	0.46	1.07	26.03	1.77	1.79	3.69	25.98	26.24
32	3.63	0.02	3.24	0.25	0.92	0.99	28.92	2.87	4.31	6.24	28.93	29.59
35	1.15	0.09	5.32	0.84	2.36	1.02	32.95	4.21	15.62	19.65	31.57	37.19
38	0.31	0.41	6.56	1.24	12.07	1.02	32.92	5.31	65.69	70.76	24.71	74.96
41	-0.01	21.91	95.62	23.11	> 100	18.33	> 100	> 100	> 100	> 100	> 100	> 100

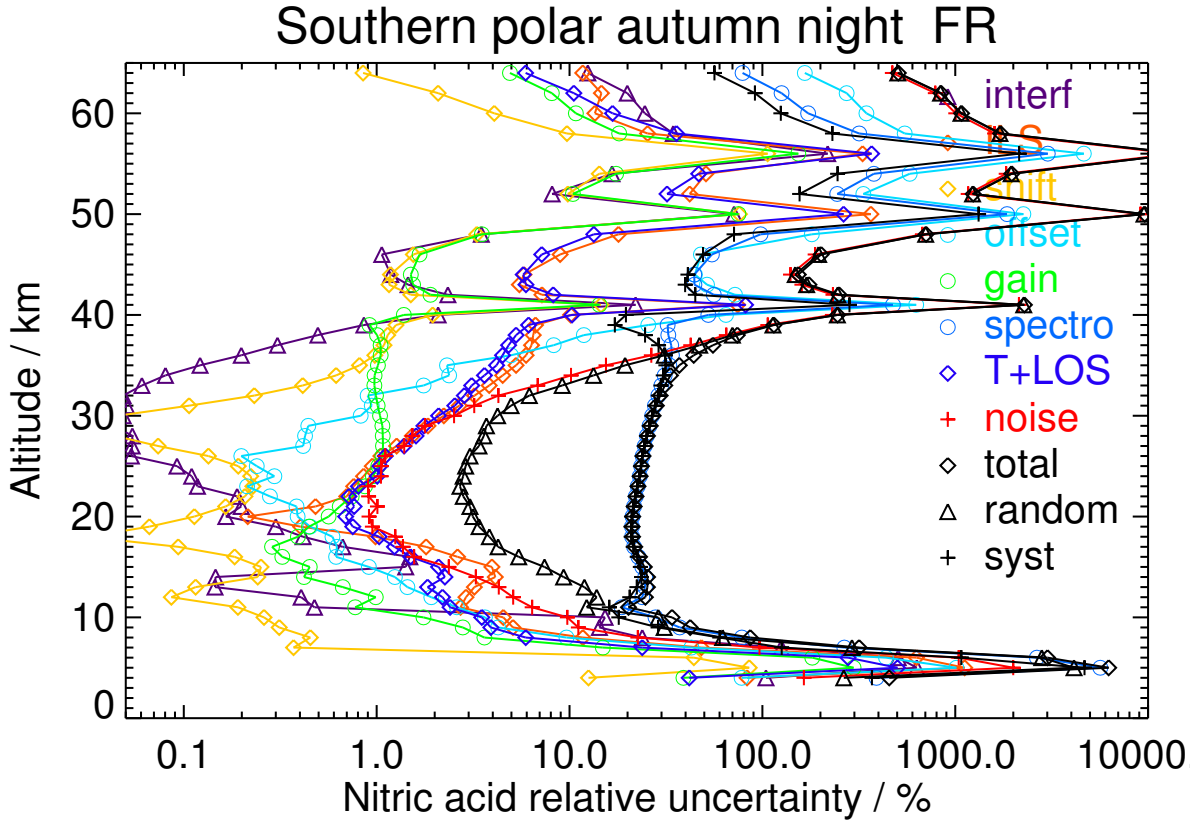


Figure S34: V8H_HNO₃_61 Southern polar autumn night

Table S39: HNO₃ error budget for Northern polar winter day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.72	2.23	12.11	0.51	3.68	2.51	39.63	6.83	14.05	27.34	35.20	44.57
11	2.19	0.45	5.84	0.25	0.86	1.32	25.18	2.80	3.93	12.05	23.43	26.34
14	5.66	0.13	4.99	0.18	0.64	0.57	23.80	1.92	1.76	9.62	22.50	24.47
17	8.46	0.04	1.46	0.09	0.38	1.28	23.30	1.19	1.24	8.51	21.84	23.44
20	9.56	0.02	1.72	0.09	0.15	1.12	22.10	0.80	1.11	3.73	21.93	22.24
23	10.65	0.02	0.82	0.08	0.20	0.94	22.49	0.61	1.07	3.20	22.33	22.56
26	11.19	0.02	1.22	0.10	0.14	0.96	23.59	0.65	1.05	4.14	23.31	23.67
29	9.17	< 0.01	1.51	0.12	0.24	0.99	25.38	0.81	1.47	6.99	24.52	25.50
32	5.78	0.01	2.58	0.33	0.50	1.21	27.52	1.19	2.54	10.04	25.94	27.82
35	2.22	0.04	3.73	0.44	1.55	1.62	32.13	1.65	7.68	14.02	30.27	33.36
38	1.09	0.10	4.60	0.53	3.13	1.09	30.35	1.51	18.51	22.81	27.89	36.03
41	0.52	0.26	8.79	1.32	8.71	0.83	39.54	1.98	46.76	52.78	33.53	62.53

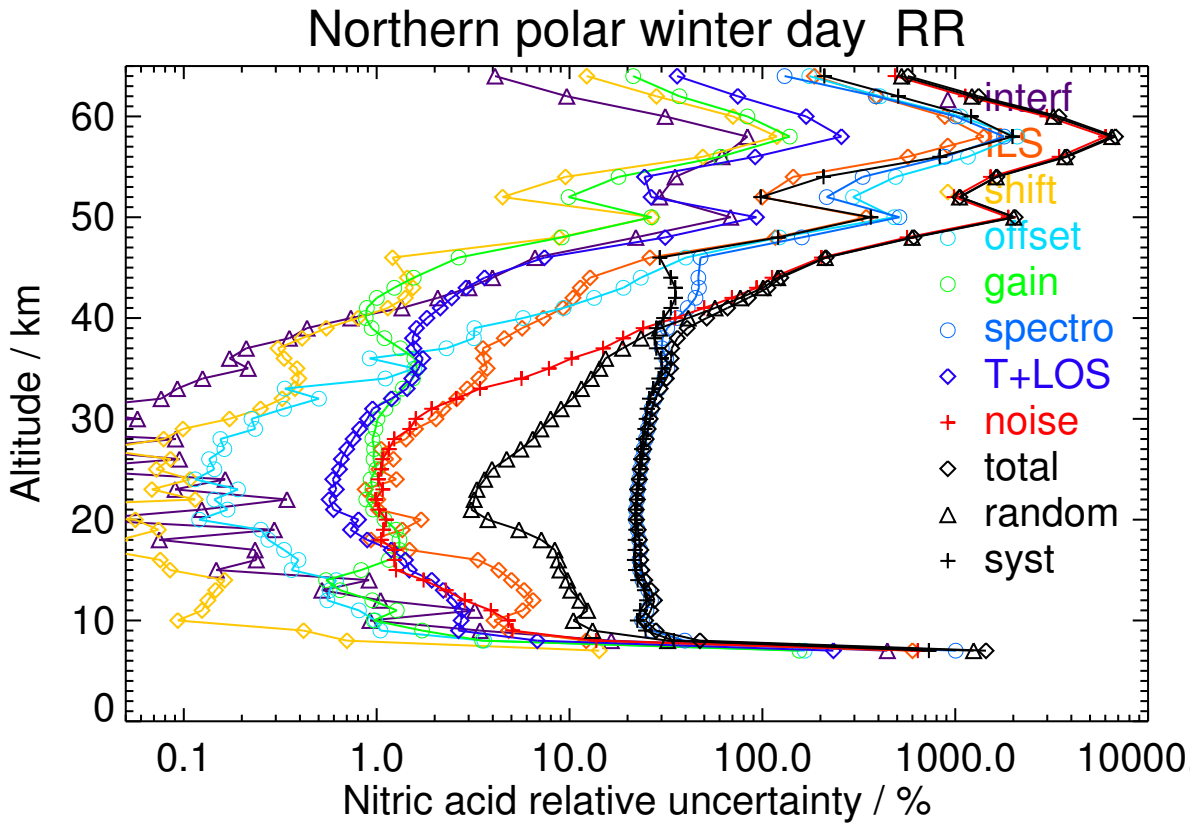


Figure S35: V8R_HNO₃_261 Northern polar winter day

Table S40: HNO₃ error budget for Northern polar winter night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.26	3.81	24.91	0.97	12.27	5.12	75.21	13.51	37.34	75.17	48.95	89.70
11	1.74	0.32	7.61	0.19	1.40	1.41	23.06	3.06	5.26	12.66	21.69	25.12
14	4.71	0.13	5.83	0.20	0.67	1.10	22.75	2.28	2.14	8.12	22.29	23.73
17	9.83	0.04	2.38	0.17	0.54	1.80	21.16	1.43	1.13	6.38	20.49	21.46
20	11.12	0.02	2.40	0.11	0.27	1.42	22.95	0.94	0.99	6.02	22.37	23.16
23	10.82	0.01	2.33	0.13	0.20	0.77	22.86	0.95	1.15	3.80	22.73	23.04
26	7.99	0.03	1.99	0.11	0.15	1.14	25.53	0.88	1.24	9.42	23.89	25.68
29	6.12	0.01	2.31	0.21	0.48	0.94	26.83	0.94	2.17	11.05	24.69	27.06
32	3.59	0.02	3.40	0.56	0.79	1.19	29.69	1.27	3.55	15.75	25.72	30.16
35	1.40	0.06	3.50	0.63	2.18	1.76	34.33	1.60	9.92	24.03	26.88	36.06
38	0.88	0.12	1.66	0.24	3.58	1.59	31.50	1.14	18.76	29.26	22.54	36.93
41	0.57	0.24	3.38	0.44	7.33	2.19	37.38	1.57	34.00	45.37	23.83	51.24

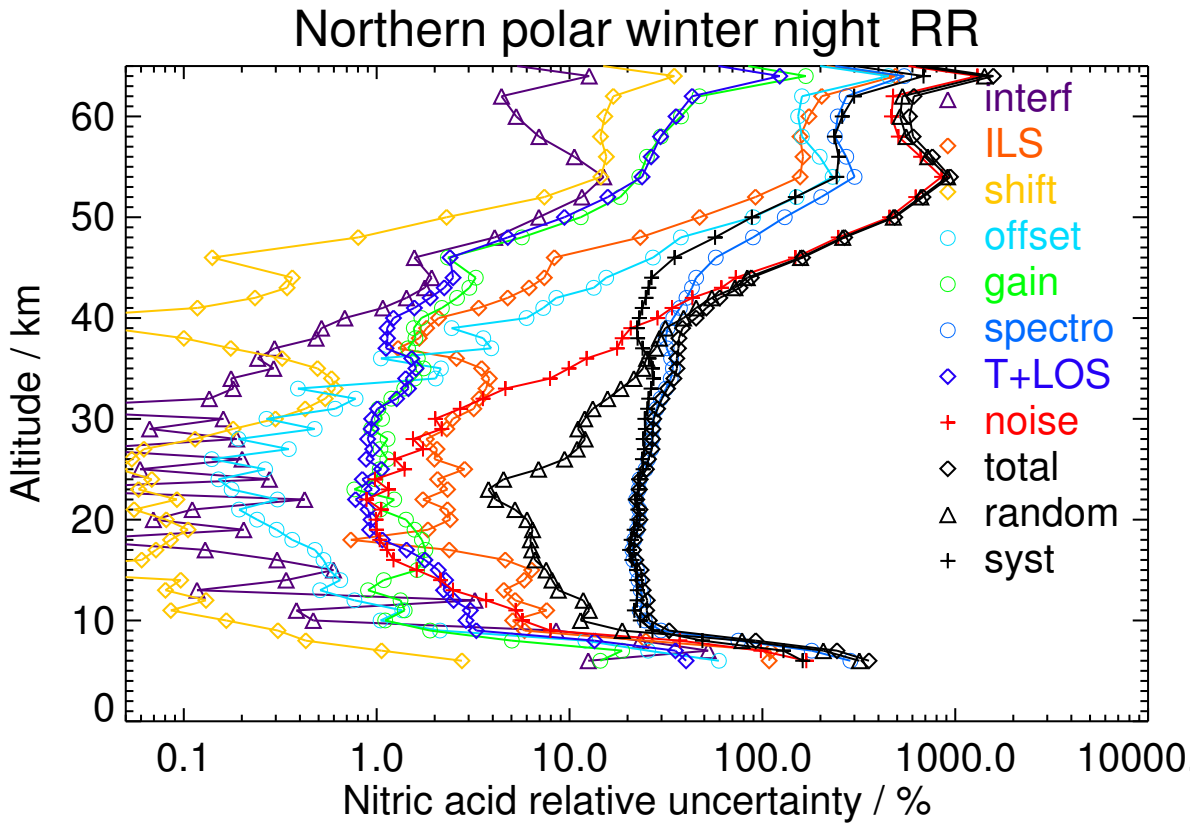


Figure S36: V8R_HNO₃_261 Northern polar winter night

Table S41: HNO₃ error budget for Northern polar spring day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	1.52	0.87	5.46	0.20	1.21	1.80	26.04	4.11	5.93	13.78	23.99	27.67
11	2.88	0.15	2.05	0.06	0.44	0.86	20.04	1.80	2.63	5.03	19.79	20.42
14	4.58	0.07	2.62	0.09	0.37	0.46	21.57	1.62	1.83	4.41	21.43	21.88
17	7.43	0.04	0.47	0.07	0.28	0.86	21.32	1.04	1.28	3.50	21.12	21.41
20	9.58	0.02	1.30	0.06	0.14	0.92	21.84	0.70	1.09	1.79	21.86	21.94
23	9.72	0.02	1.32	0.12	0.14	0.94	23.05	0.80	1.26	1.80	23.09	23.16
26	7.98	0.01	1.75	0.06	0.18	1.04	24.55	0.91	1.59	2.28	24.59	24.70
29	5.58	0.01	2.95	0.30	0.32	0.98	26.03	1.17	2.61	3.78	26.10	26.38
32	2.94	0.02	3.63	0.49	0.72	0.96	27.78	1.56	5.55	7.44	27.65	28.63
35	1.06	0.08	3.69	0.43	2.52	1.05	29.00	2.10	17.49	19.20	28.35	34.24
38	0.22	0.63	8.30	0.94	14.66	2.02	22.79	6.17	90.29	93.51	15.94	94.86
41	-0.01	15.70	> 100	29.30	> 100	30.38	> 100	> 100	> 100	> 100	> 100	> 100

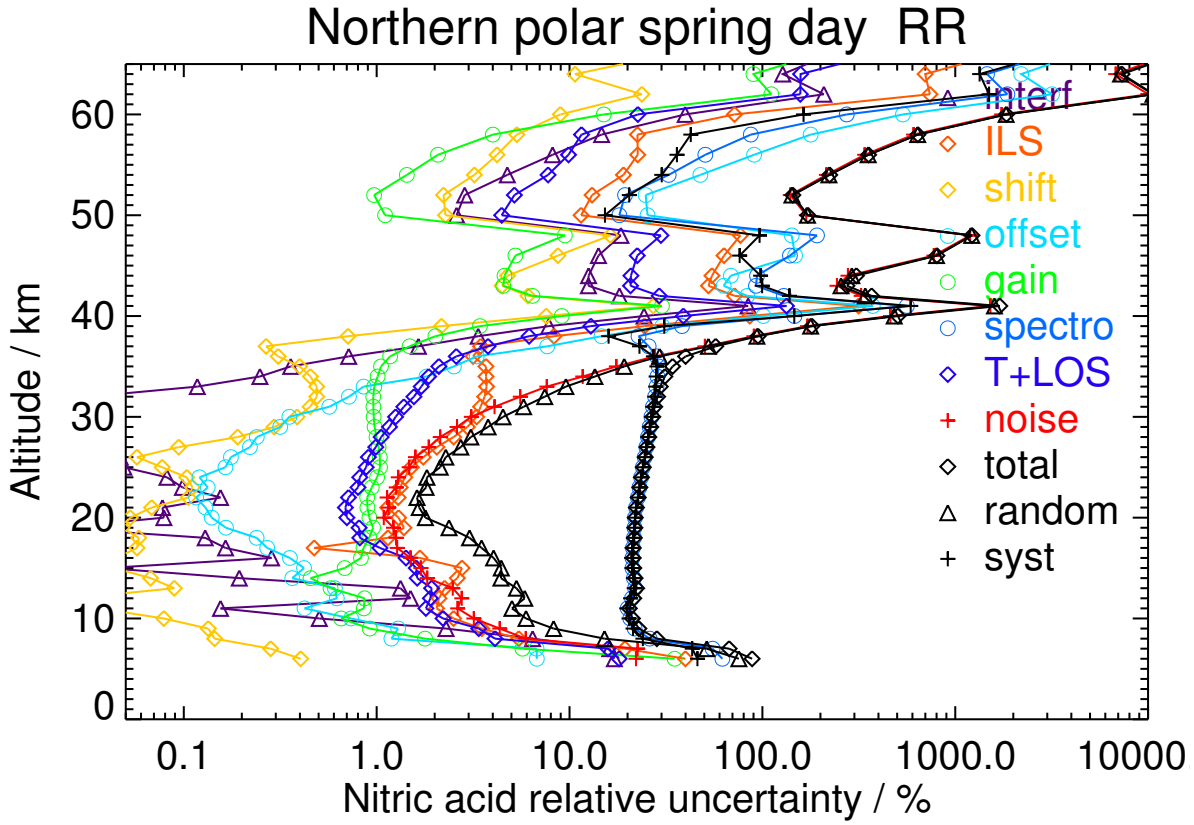


Figure S37: V8R_HNO₃_261 Northern polar spring day

Table S42: HNO₃ error budget for Northern polar spring night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	1.12	1.30	8.17	0.36	2.85	1.73	31.81	6.78	10.63	24.75	25.26	35.36
11	2.61	0.19	3.02	0.18	0.85	0.76	20.89	2.27	3.26	7.08	20.31	21.51
14	4.02	0.10	2.67	0.16	0.55	0.71	22.08	1.73	2.25	6.99	21.33	22.44
17	6.44	0.04	1.19	0.11	0.40	0.80	22.33	1.27	1.54	5.92	21.68	22.47
20	9.61	0.02	1.36	0.07	0.15	0.91	22.16	0.73	1.13	3.00	22.06	22.26
23	9.89	0.02	1.34	0.10	0.16	0.96	23.20	0.80	1.29	2.18	23.20	23.31
26	8.12	0.01	2.00	0.08	0.17	1.02	24.77	0.92	1.53	2.64	24.80	24.94
29	5.29	0.01	3.53	0.37	0.39	1.00	26.37	1.28	2.81	4.16	26.48	26.81
32	2.35	0.03	4.57	0.62	1.00	0.96	28.66	1.84	6.83	8.06	28.81	29.91
35	0.78	0.11	4.11	0.46	3.61	1.04	29.24	2.22	23.43	24.96	28.58	37.95
38	0.19	0.63	7.69	0.86	16.71	2.25	25.32	5.09	> 100	> 100	15.93	> 100
41	0.02	9.97	> 100	19.83	> 100	24.62	> 100	78.54	> 100	> 100	> 100	> 100

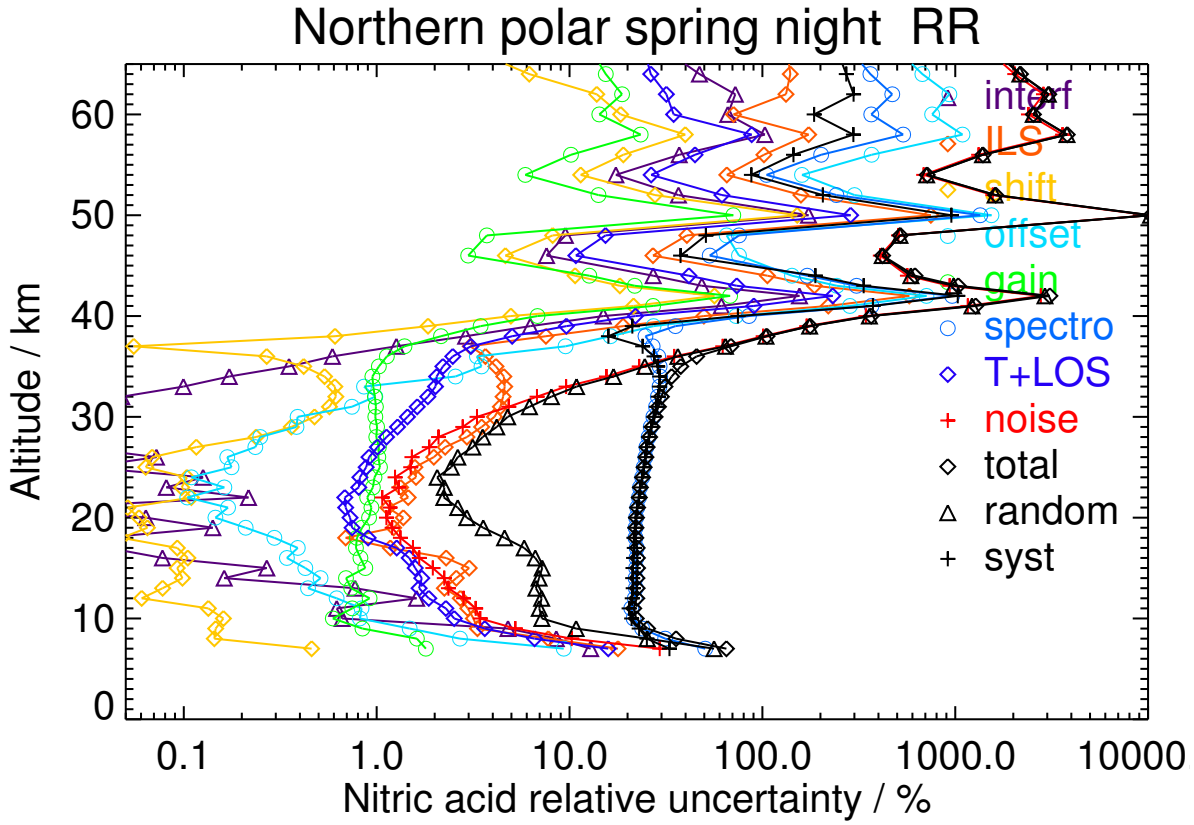


Figure S38: V8R_HNO₃_261 Northern polar spring night

Table S43: HNO₃ error budget for Northern polar summer day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	-0.26	1.61	30.73	0.47	7.49	1.09	57.64	7.97	25.06	27.39	65.33	70.84
11	1.71	0.42	3.77	0.11	1.38	1.15	26.25	2.66	4.63	10.90	24.83	27.12
14	2.01	0.29	3.10	0.07	0.91	1.39	22.57	1.42	3.62	7.64	21.87	23.17
17	3.35	0.16	2.72	0.08	0.61	0.42	22.97	1.40	2.37	5.15	22.73	23.30
20	6.24	0.05	0.92	0.05	0.22	0.84	22.30	0.59	1.25	3.23	22.14	22.38
23	7.97	0.02	0.58	0.04	0.27	1.04	22.69	0.73	1.49	1.97	22.69	22.78
26	7.38	0.03	1.31	0.18	0.09	1.10	23.82	0.70	1.18	1.65	23.87	23.92
29	5.54	0.01	2.89	0.08	0.56	0.65	25.05	1.08	2.43	2.94	25.19	25.37
32	3.21	0.02	3.97	0.48	0.78	0.63	25.81	1.36	3.84	4.48	26.07	26.45
35	1.42	0.05	2.61	0.60	1.69	0.87	26.19	1.59	8.81	9.48	26.21	27.87
38	0.47	0.18	1.15	0.31	5.16	1.44	26.09	1.96	30.59	32.10	24.91	40.63
41	0.17	0.95	7.30	0.42	21.72	1.60	24.63	2.41	92.27	97.21	14.34	98.26

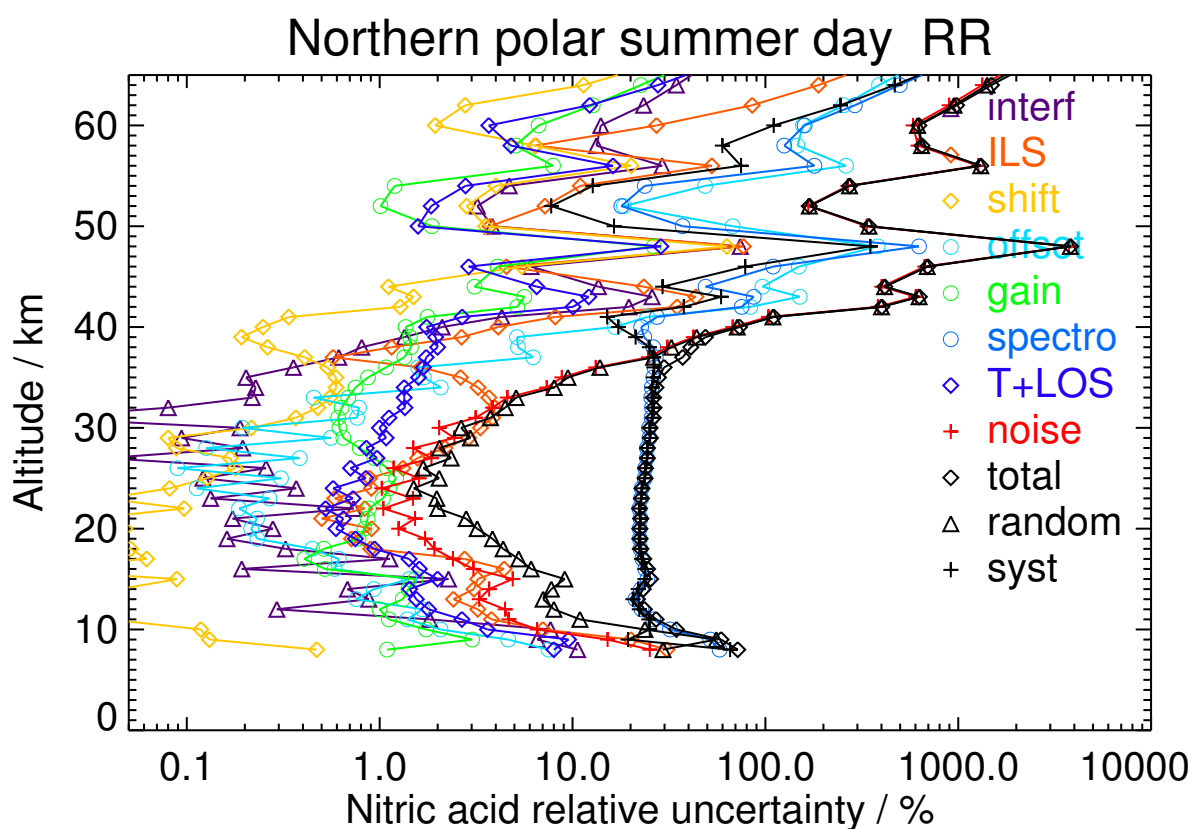


Figure S39: V8R_HNO₃_261 Northern polar summer day

Table S44: HNO₃ error budget for Northern polar summer night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
14	1.75	0.14	2.02	0.07	2.19	0.78	22.59	2.69	5.35	9.14	21.73	23.57
17	3.77	0.08	2.48	0.04	0.43	0.43	22.45	1.64	2.38	4.33	22.37	22.78
20	7.25	0.02	0.75	0.04	0.21	0.78	21.78	0.72	1.32	2.32	21.73	21.85
23	8.98	0.01	0.86	0.07	0.21	1.02	22.65	0.74	1.31	1.87	22.66	22.74
26	8.00	0.01	1.38	0.12	0.15	1.08	23.78	0.81	1.30	1.87	23.82	23.90
29	5.75	< 0.01	2.66	0.20	0.44	0.83	25.21	1.05	2.29	2.85	25.33	25.49
32	3.20	0.02	3.55	0.57	0.86	0.89	25.85	1.38	4.13	4.78	26.05	26.49
35	1.30	0.05	3.24	0.69	2.39	1.09	26.73	1.64	11.15	11.88	26.80	29.32
38	0.47	0.18	0.61	0.39	6.57	1.34	25.01	1.66	35.10	36.48	23.98	43.66
41	0.23	0.60	2.98	0.32	18.21	1.47	23.33	1.86	80.32	84.26	15.57	85.69

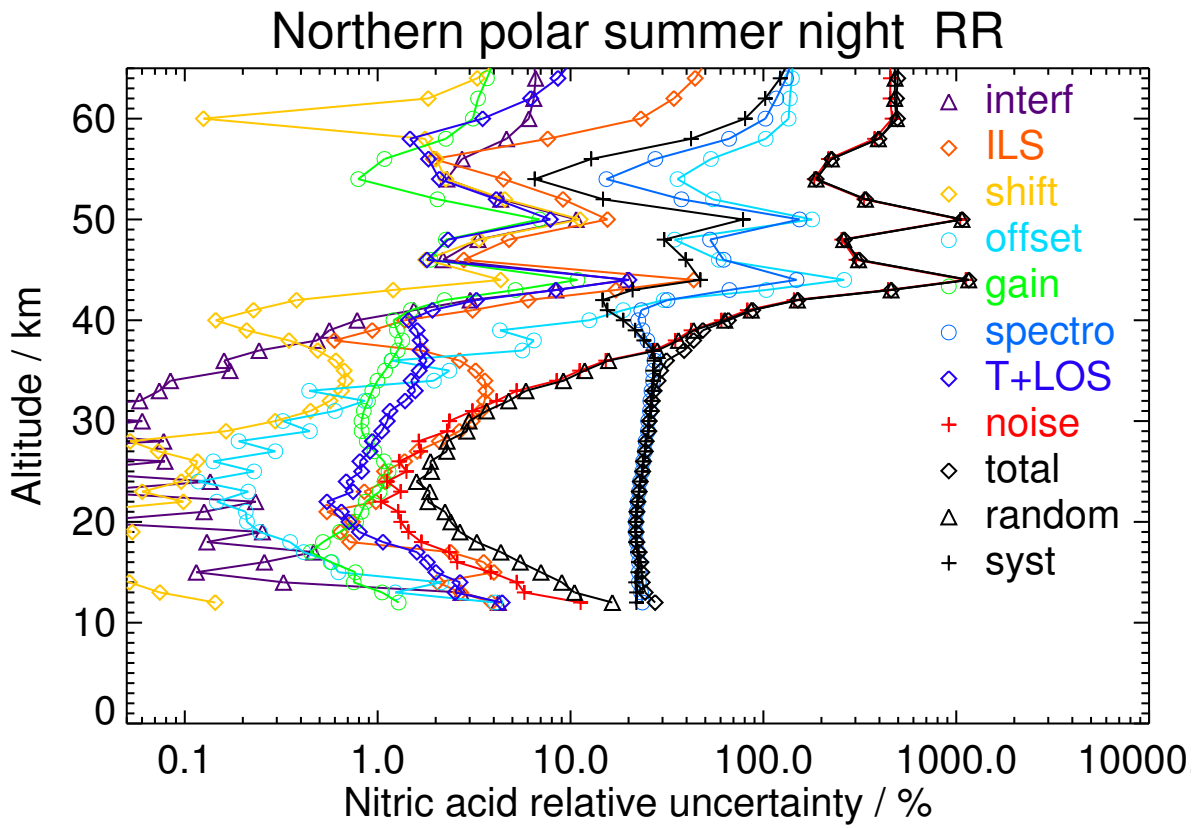


Figure S40: V8R_HNO₃_261 Northern polar summer night

Table S45: HNO₃ error budget for Northern polar autumn day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	-0.02	31.17	> 100	4.21	> 100	7.71	> 100	> 100	> 100	> 100	> 100	> 100
11	1.20	0.85	4.24	0.25	3.73	1.38	25.99	4.15	12.69	20.06	22.04	29.80
14	2.27	0.12	4.42	0.27	1.11	0.48	23.65	3.17	4.36	8.88	23.03	24.69
17	6.48	0.04	2.38	0.12	0.46	0.63	21.16	1.64	1.59	4.98	20.85	21.43
20	10.66	0.02	1.06	0.06	0.19	0.91	21.11	0.75	1.10	3.19	20.96	21.20
23	12.31	0.02	1.16	0.10	0.13	0.88	22.27	0.73	1.07	2.18	22.25	22.36
26	10.49	< 0.01	1.58	0.06	0.14	1.08	23.88	0.90	1.26	2.50	23.87	24.00
29	6.15	< 0.01	2.90	0.28	0.35	1.11	26.65	1.30	2.39	4.66	26.56	26.97
32	2.70	0.02	3.56	0.49	0.94	1.10	28.41	1.77	5.98	9.14	27.88	29.34
35	1.02	0.09	3.19	0.36	3.05	1.14	27.92	1.96	18.41	20.50	26.88	33.81
38	0.35	0.32	1.88	0.40	10.14	1.44	24.68	2.95	60.82	63.67	19.30	66.53
41	0.09	1.66	16.65	2.36	58.61	4.02	51.10	11.56	> 100	> 100	26.97	> 100

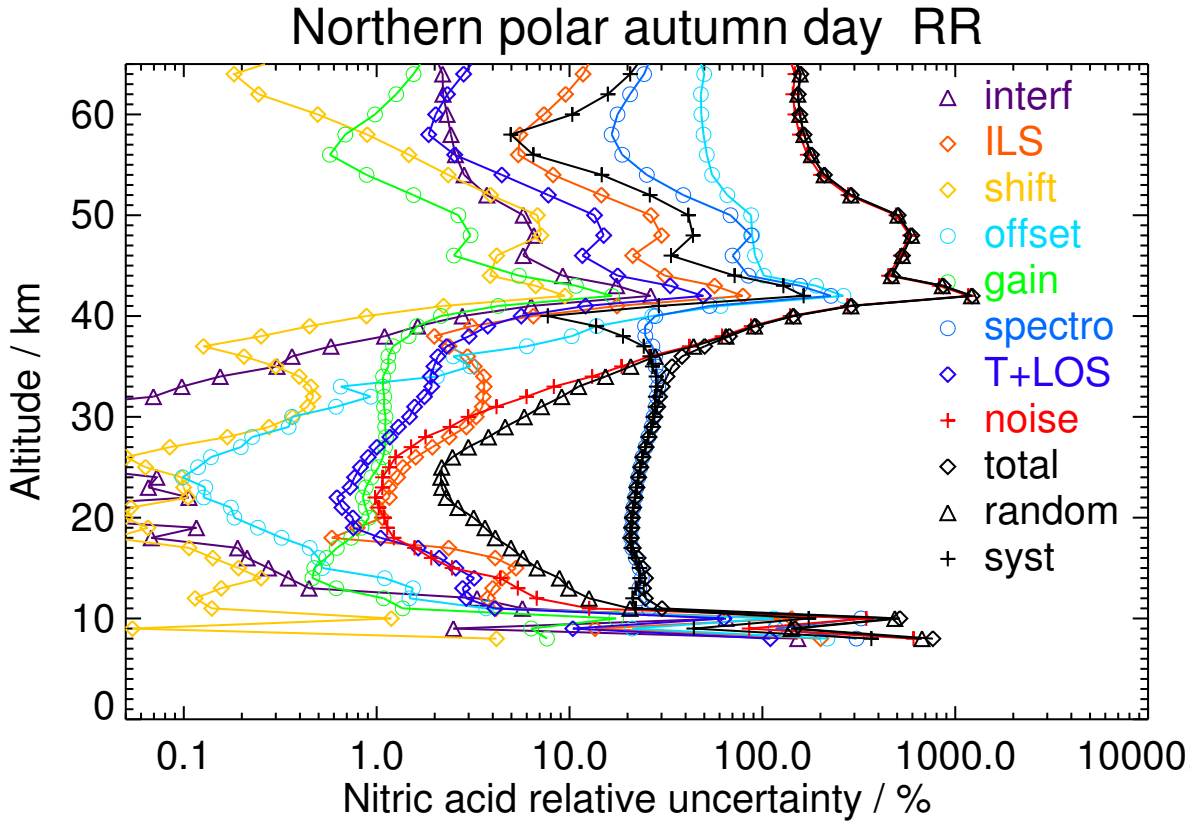


Figure S41: V8R_HNO₃_261 Northern polar autumn day

Table S46: HNO₃ error budget for Northern polar autumn night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
11	1.38	0.71	3.88	0.26	3.35	1.27	25.47	3.92	10.92	16.18	23.46	28.50
14	2.70	0.10	4.64	0.29	0.97	0.49	24.90	2.94	3.68	9.25	24.07	25.79
17	7.26	0.03	2.07	0.12	0.45	0.50	22.24	1.53	1.43	4.91	21.90	22.44
20	10.98	0.02	1.25	0.07	0.18	0.93	22.46	0.75	1.07	3.85	22.22	22.55
23	12.28	0.01	1.19	0.10	0.15	0.92	23.09	0.75	1.08	3.15	22.96	23.17
26	10.25	< 0.01	2.00	0.08	0.15	1.13	24.63	0.97	1.28	2.73	24.64	24.79
29	5.84	< 0.01	3.27	0.34	0.39	1.15	26.74	1.35	2.54	5.54	26.55	27.12
32	2.71	0.02	3.57	0.48	0.92	1.12	28.01	1.71	5.88	8.97	27.51	28.93
35	1.02	0.08	3.58	0.41	2.93	1.31	30.64	1.93	18.20	21.92	28.57	36.02
38	0.39	0.27	2.35	0.41	8.77	1.46	31.59	2.33	53.71	58.04	24.58	63.03
41	0.13	1.17	11.60	1.64	40.96	2.98	53.58	8.28	> 100	> 100	19.78	> 100

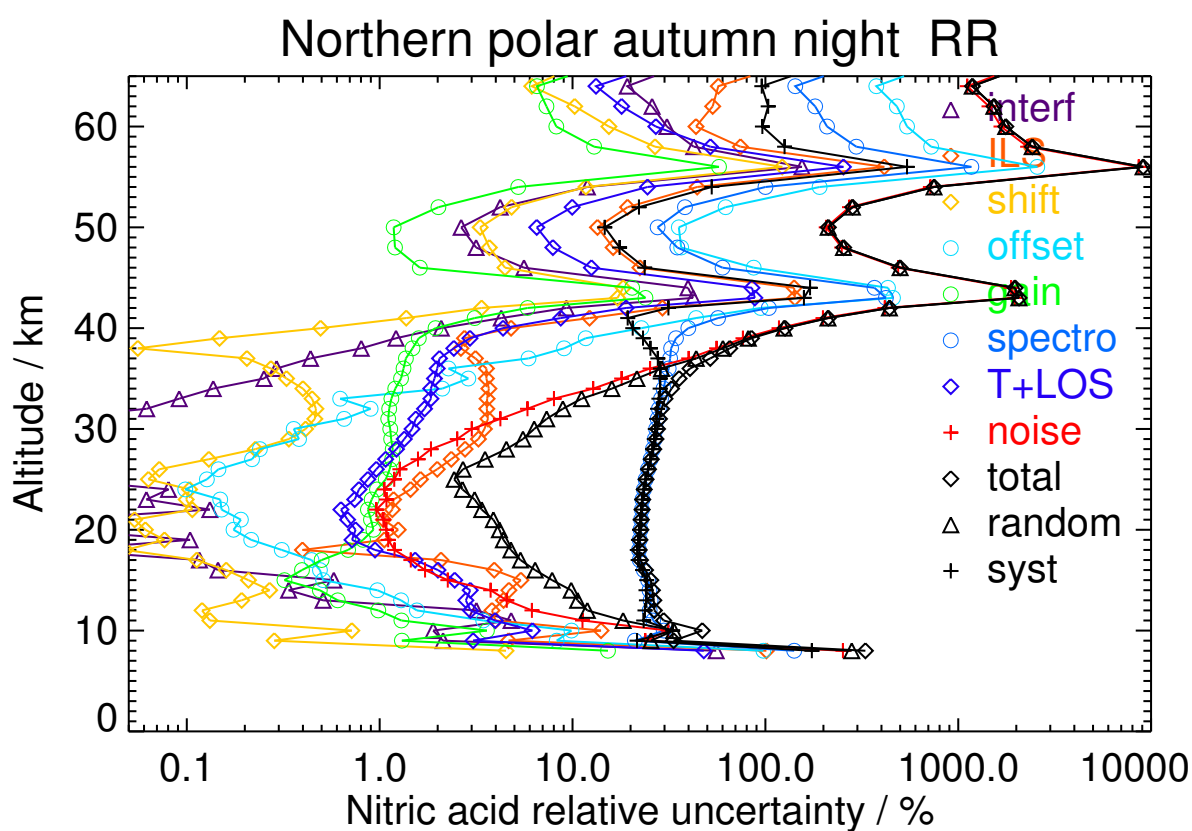


Figure S42: V8R_HNO3_261 Northern polar autumn night

Table S47: HNO₃ error budget for Northern midlatitude winter day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.14	6.08	33.62	1.03	13.11	6.00	98.78	16.75	50.83	> 100	31.77	> 100
11	1.41	0.47	6.87	0.26	1.44	1.10	26.76	3.02	6.03	14.82	24.34	28.50
14	2.87	0.23	3.08	0.12	0.82	0.97	26.00	1.61	2.95	14.00	22.42	26.43
17	4.59	0.11	2.73	0.14	0.62	0.94	24.62	1.54	2.09	9.35	23.11	24.93
20	8.27	0.04	1.05	0.08	0.26	1.03	22.21	0.74	1.25	4.02	21.94	22.30
23	8.67	0.04	1.07	0.11	0.17	0.98	23.42	0.73	1.29	4.50	23.08	23.52
26	9.44	0.02	1.41	0.08	0.14	0.93	23.47	0.71	1.17	3.73	23.27	23.57
29	6.30	0.02	3.28	0.34	0.31	0.80	25.74	1.16	2.00	4.28	25.72	26.07
32	3.14	0.02	3.76	0.63	0.60	0.89	26.52	1.39	4.06	5.78	26.54	27.16
35	1.21	0.08	2.61	0.49	2.38	1.25	27.83	1.70	13.17	15.70	26.81	31.07
38	0.51	0.20	2.51	0.32	5.85	1.26	27.11	1.54	35.95	38.60	24.11	45.51
41	0.18	0.87	6.48	0.77	20.93	1.88	29.84	2.91	> 100	> 100	20.45	> 100

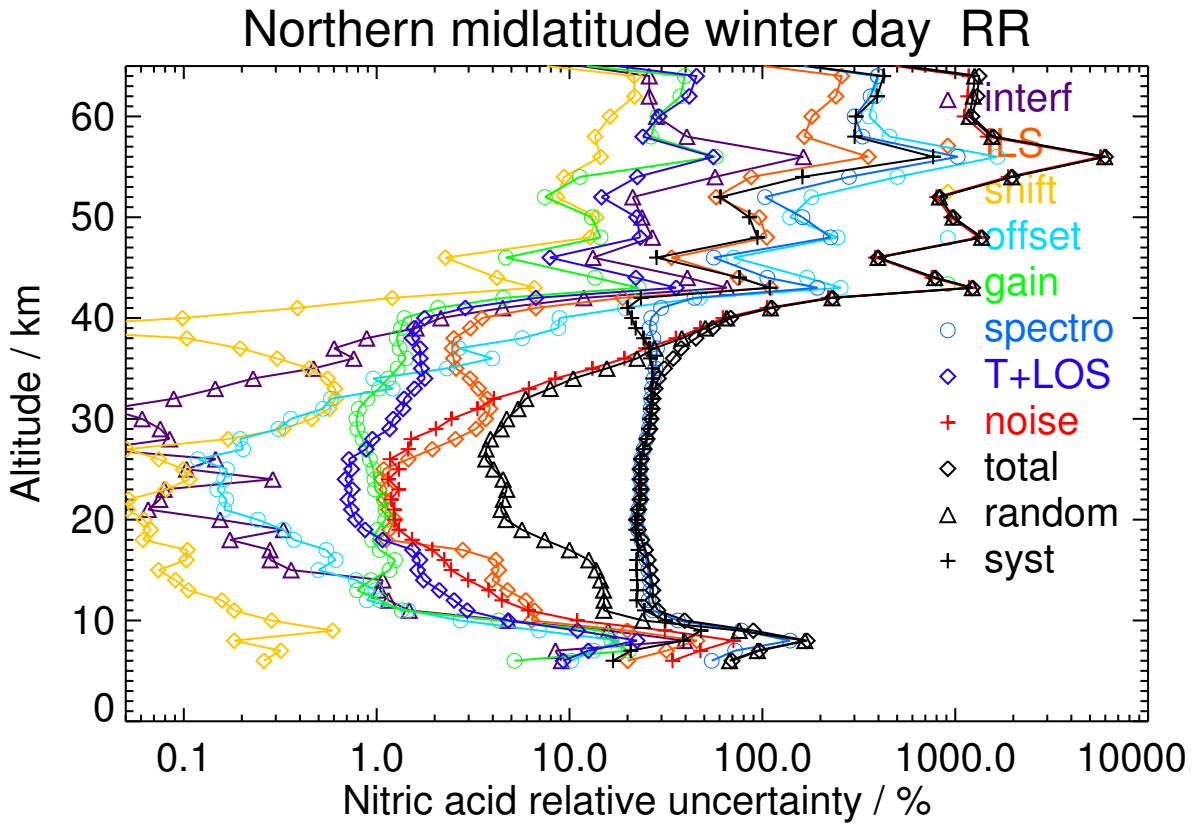


Figure S43: V8R_HNO₃_261 Northern midlatitude winter day

Table S48: HNO₃ error budget for Northern midlatitude winter night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.04	24.05	> 100	5.76	71.64	30.45	> 100	96.96	> 100	> 100	> 100	> 100
11	1.44	0.57	6.73	0.28	1.54	1.47	25.30	2.88	5.70	14.56	22.79	27.04
14	2.34	0.26	3.14	0.16	1.03	1.16	26.36	1.85	3.66	15.17	22.22	26.91
17	4.41	0.10	2.95	0.16	0.69	0.89	24.60	1.59	2.17	11.16	22.31	24.95
20	8.02	0.04	1.30	0.09	0.26	1.07	22.24	0.78	1.29	4.41	21.92	22.36
23	8.60	0.04	1.03	0.11	0.18	0.94	23.29	0.73	1.30	4.46	22.95	23.38
26	8.91	0.02	1.61	0.09	0.14	0.91	23.81	0.75	1.24	3.34	23.70	23.93
29	5.99	0.02	3.47	0.32	0.33	0.74	25.71	1.19	2.13	4.22	25.73	26.07
32	2.92	0.03	4.06	0.67	0.64	0.82	26.64	1.40	4.26	6.78	26.49	27.35
35	1.17	0.10	2.36	0.52	2.44	1.20	26.47	1.67	13.30	14.83	25.96	29.89
38	0.37	0.35	2.44	0.51	7.93	1.71	27.65	2.18	47.29	49.96	24.12	55.48
41	0.12	1.37	14.11	1.68	29.79	3.42	29.40	4.88	> 100	> 100	15.87	> 100

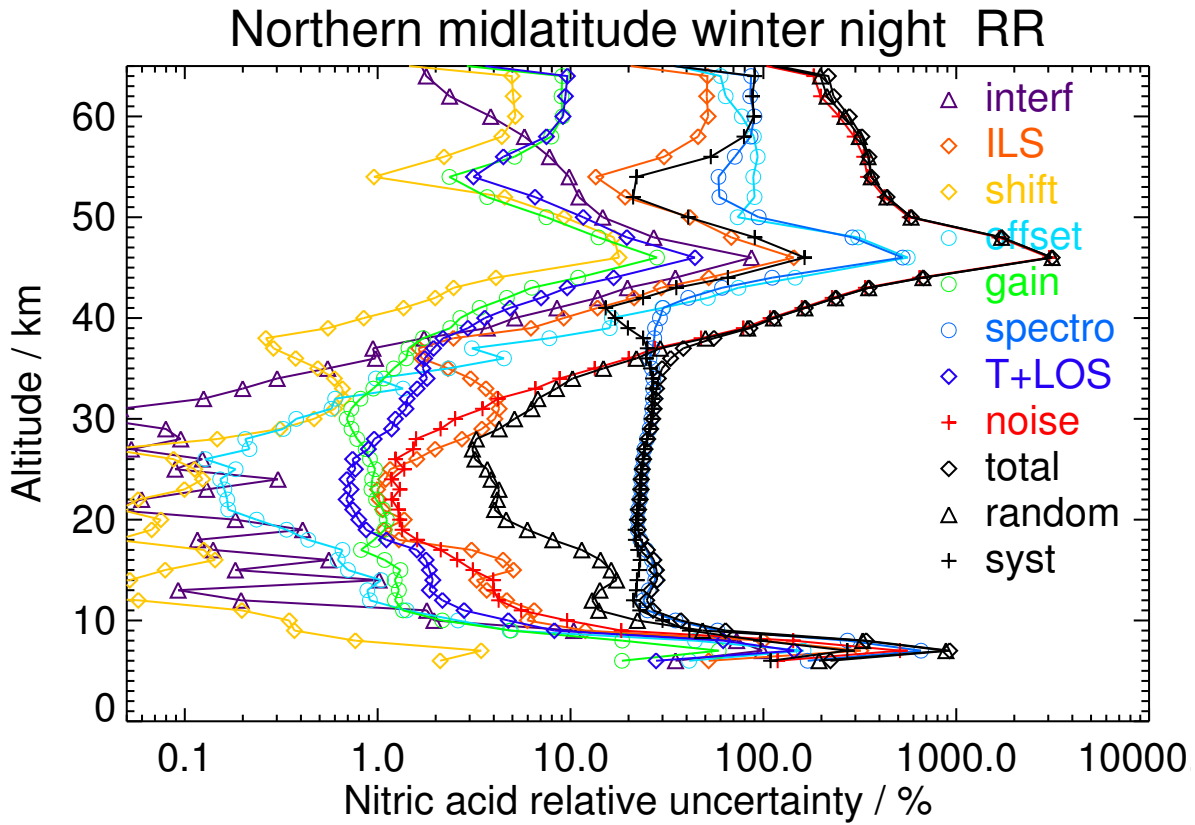


Figure S44: V8R_HNO₃_261 Northern midlatitude winter night

Table S49: HNO₃ error budget for Northern midlatitude spring day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.66	1.39	16.21	0.51	3.50	2.62	39.92	7.69	14.04	38.22	25.95	46.20
11	1.87	0.31	4.85	0.21	1.02	1.43	25.75	2.77	4.68	14.20	22.76	26.83
14	2.41	0.19	4.33	0.15	0.96	1.32	26.62	2.05	3.50	16.79	21.56	27.33
17	4.17	0.07	2.15	0.10	0.56	1.06	24.80	1.41	2.20	12.10	21.94	25.06
20	7.01	0.04	1.02	0.08	0.26	0.99	22.68	0.79	1.44	5.92	22.00	22.78
23	8.28	0.04	1.14	0.11	0.13	0.97	22.84	0.70	1.26	2.95	22.74	22.93
26	7.19	0.01	1.67	0.09	0.22	0.97	24.21	0.91	1.71	2.45	24.25	24.37
29	4.85	0.02	3.05	0.29	0.28	0.76	25.30	1.12	2.53	3.80	25.36	25.65
32	2.47	0.02	3.92	0.62	0.93	0.78	26.75	1.43	5.73	7.33	26.72	27.71
35	0.97	0.10	2.93	0.55	3.24	1.04	27.08	1.74	17.35	19.36	26.13	32.52
38	0.36	0.31	3.30	0.42	8.93	1.40	24.47	2.07	50.80	53.39	20.64	57.24
41	0.13	1.30	14.55	1.16	31.65	2.71	34.24	4.80	> 100	> 100	14.93	> 100

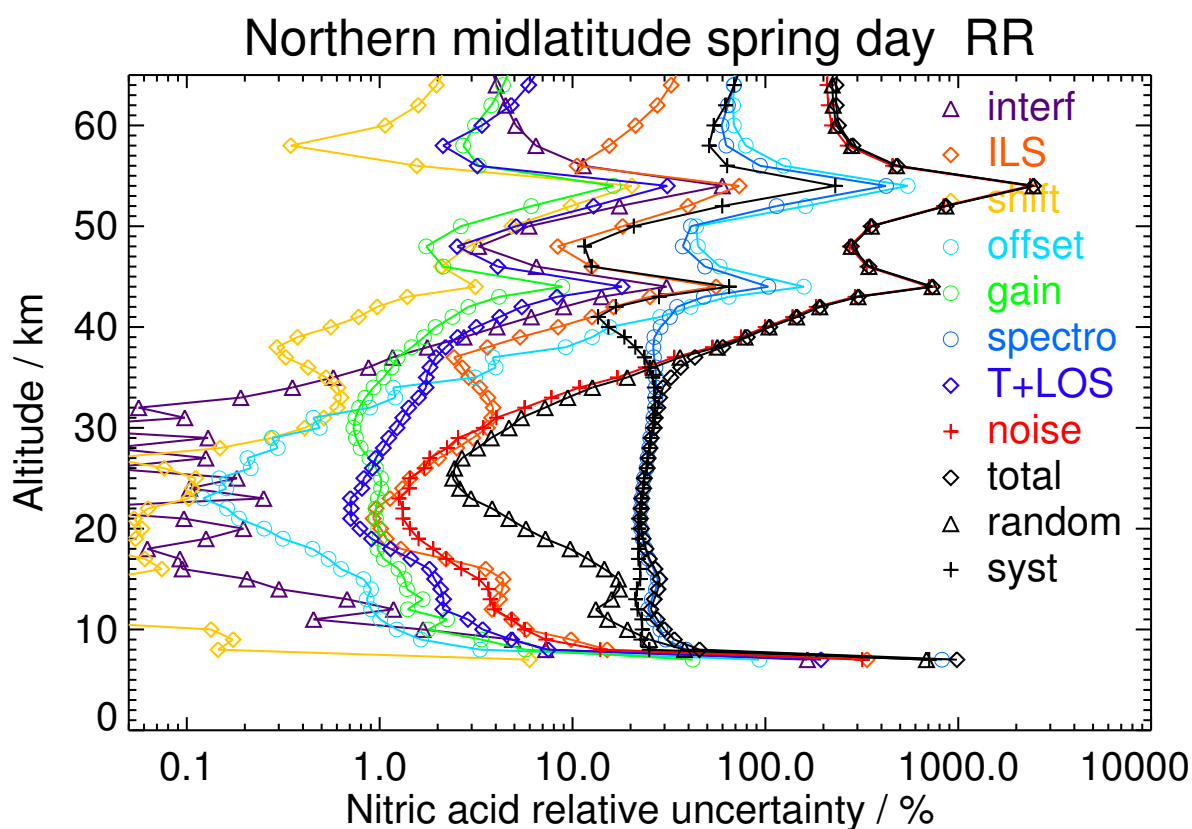


Figure S45: V8R_HNO₃_261 Northern midlatitude spring day

Table S50: HNO₃ error budget for Northern midlatitude spring night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.44	1.95	23.65	0.68	6.42	3.09	59.72	12.42	21.95	60.10	34.71	69.40
11	1.92	0.26	3.03	0.13	1.00	1.30	23.93	2.42	4.36	11.93	21.61	24.68
14	2.73	0.17	3.66	0.14	0.70	0.93	24.43	1.90	2.98	10.91	22.48	24.99
17	5.04	0.07	1.32	0.08	0.43	0.94	22.92	1.21	1.80	7.51	21.83	23.09
20	7.43	0.04	1.10	0.07	0.23	0.99	22.59	0.76	1.34	4.80	22.18	22.70
23	8.37	0.03	1.21	0.11	0.12	0.98	23.21	0.73	1.25	2.85	23.13	23.31
26	6.91	0.02	1.74	0.09	0.22	0.97	24.60	0.90	1.71	2.75	24.61	24.76
29	4.98	0.02	3.11	0.26	0.29	0.74	25.29	1.08	2.50	3.67	25.37	25.64
32	2.55	0.02	4.05	0.61	0.79	0.81	26.88	1.45	5.39	6.58	26.99	27.78
35	1.05	0.09	2.48	0.46	2.56	1.12	27.02	1.66	15.49	17.73	25.94	31.42
38	0.43	0.24	1.88	0.31	6.58	1.37	25.22	1.79	42.12	44.29	22.36	49.62
41	0.05	3.87	47.33	4.02	87.71	9.58	67.41	16.66	> 100	> 100	49.18	> 100

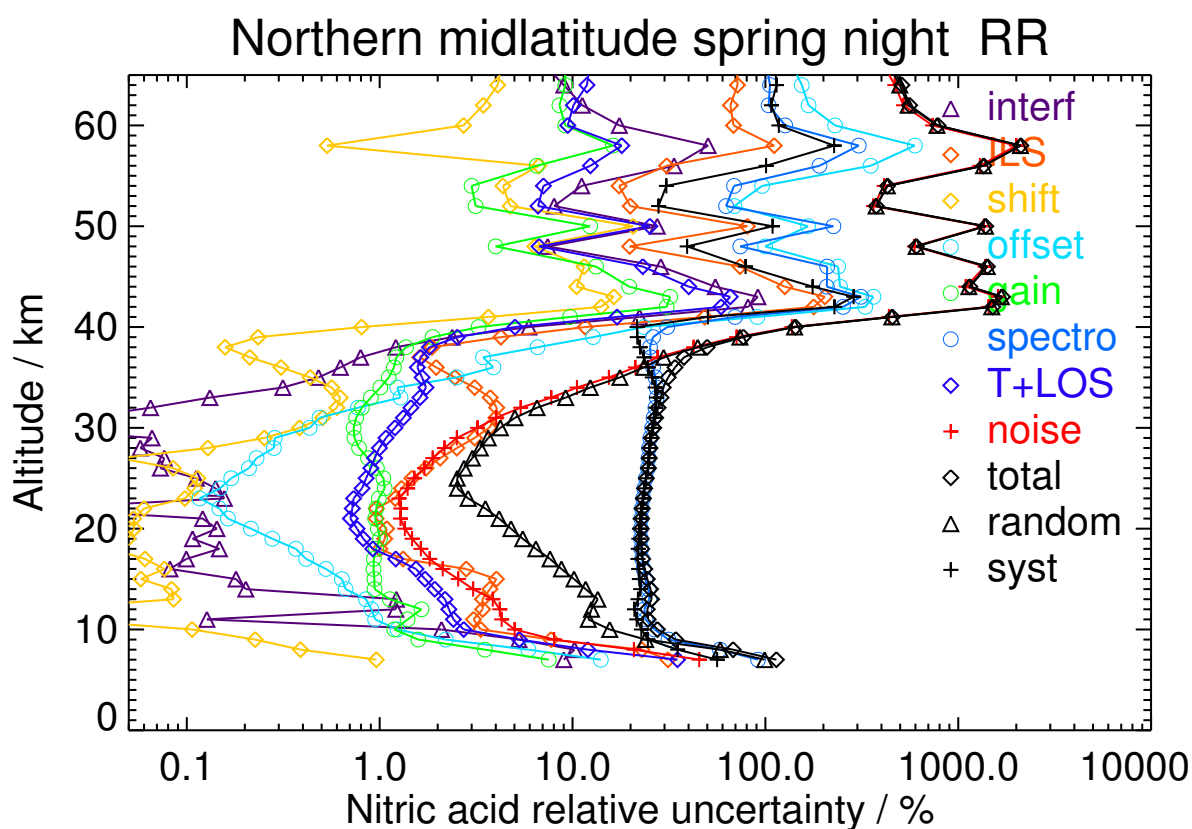


Figure S46: V8R_HNO₃_261 Northern midlatitude spring night

Table S51: HNO₃ error budget for Northern midlatitude summer day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.59	0.88	3.91	0.22	4.23	2.57	30.53	4.40	14.50	26.30	22.59	34.67
11	0.35	0.90	9.55	0.35	6.34	5.95	32.66	4.17	21.54	34.64	22.71	41.42
14	0.27	1.33	9.81	0.46	11.31	5.58	36.25	4.52	32.88	45.96	23.68	51.70
17	0.75	0.56	7.61	0.36	3.47	1.44	32.59	3.64	12.73	23.41	27.60	36.19
20	3.85	0.10	1.68	0.10	0.66	0.44	24.32	1.45	2.53	5.17	24.02	24.57
23	7.08	0.04	0.80	0.08	0.20	0.91	23.10	0.69	1.59	2.49	23.07	23.20
26	7.03	0.03	1.51	0.11	0.16	0.94	23.81	0.77	1.46	1.91	23.86	23.94
29	5.06	0.02	2.90	0.20	0.36	0.65	25.11	1.07	2.45	2.98	25.26	25.43
32	3.21	0.02	3.08	0.43	0.55	0.74	25.59	1.08	3.82	4.35	25.73	26.10
35	1.57	0.06	2.45	0.43	1.90	0.98	26.51	1.34	9.87	10.49	26.51	28.51
38	0.65	0.16	1.20	0.31	4.68	1.11	26.42	1.47	26.98	28.06	25.79	38.12
41	0.21	0.67	1.18	0.28	16.59	1.01	29.73	1.76	89.15	91.63	26.77	95.46

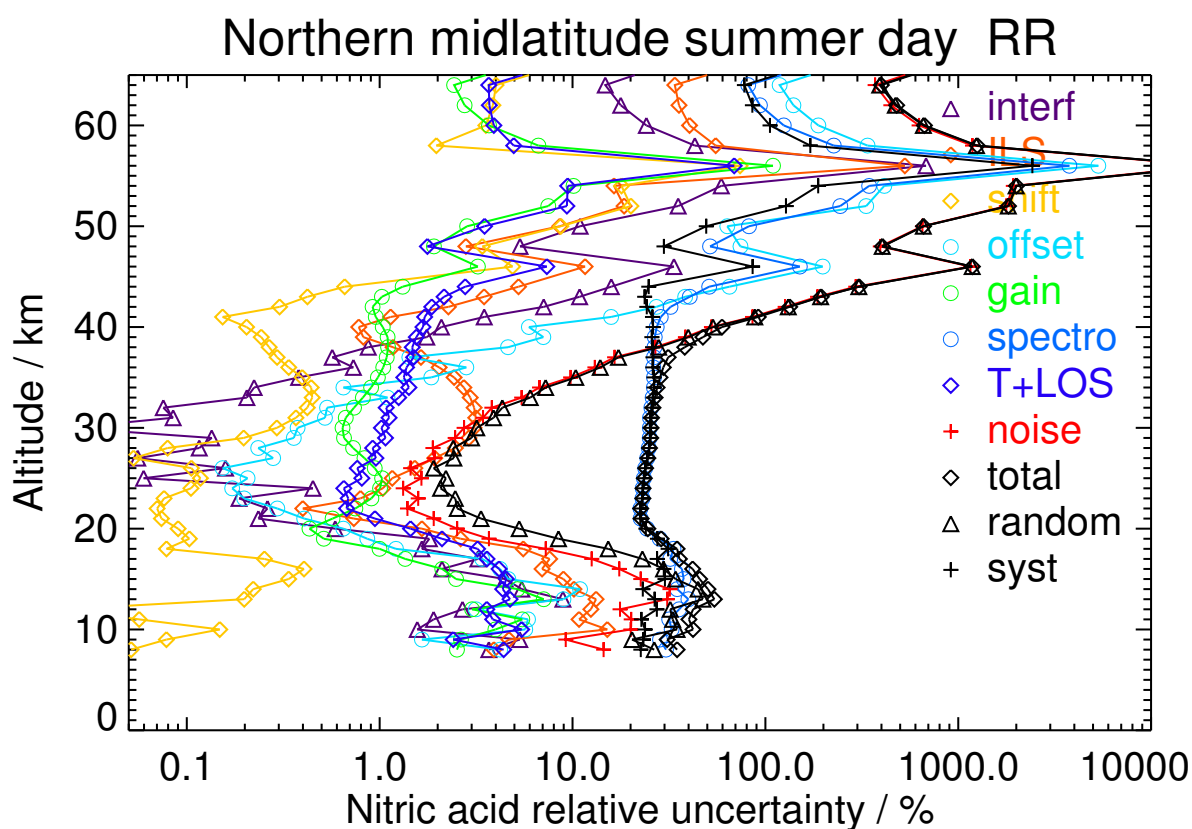


Figure S47: V8R_HNO₃_261 Northern midlatitude summer day

Table S52: HNO₃ error budget for Northern midlatitude summer night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.28	2.07	15.78	0.65	11.16	5.98	48.05	8.78	29.98	54.83	26.33	60.82
11	0.25	1.21	8.70	0.47	10.61	3.58	40.68	5.22	30.65	47.59	23.66	53.14
14	0.29	1.59	10.68	0.37	8.73	2.81	34.80	4.40	28.09	42.10	21.18	47.12
17	1.35	0.32	4.92	0.18	1.47	0.87	25.54	2.40	6.44	12.97	23.63	26.95
20	4.12	0.09	1.26	0.08	0.48	0.62	23.05	1.15	2.27	5.57	22.56	23.24
23	7.01	0.06	0.81	0.08	0.20	0.88	22.63	0.65	1.49	2.50	22.59	22.73
26	6.91	0.03	1.49	0.13	0.19	0.92	23.88	0.80	1.56	2.03	23.93	24.01
29	5.02	0.03	2.74	0.16	0.33	0.64	24.86	1.03	2.40	2.92	24.98	25.15
32	3.20	0.02	3.12	0.41	0.54	0.69	25.54	1.06	3.83	4.31	25.70	26.05
35	1.65	0.06	2.60	0.49	1.69	0.94	26.16	1.32	9.26	10.18	26.05	27.97
38	0.63	0.15	1.25	0.37	4.66	1.21	27.88	1.61	27.48	29.02	26.79	39.49
41	0.21	0.63	1.29	0.35	15.70	1.01	28.30	1.76	86.61	89.45	23.54	92.50

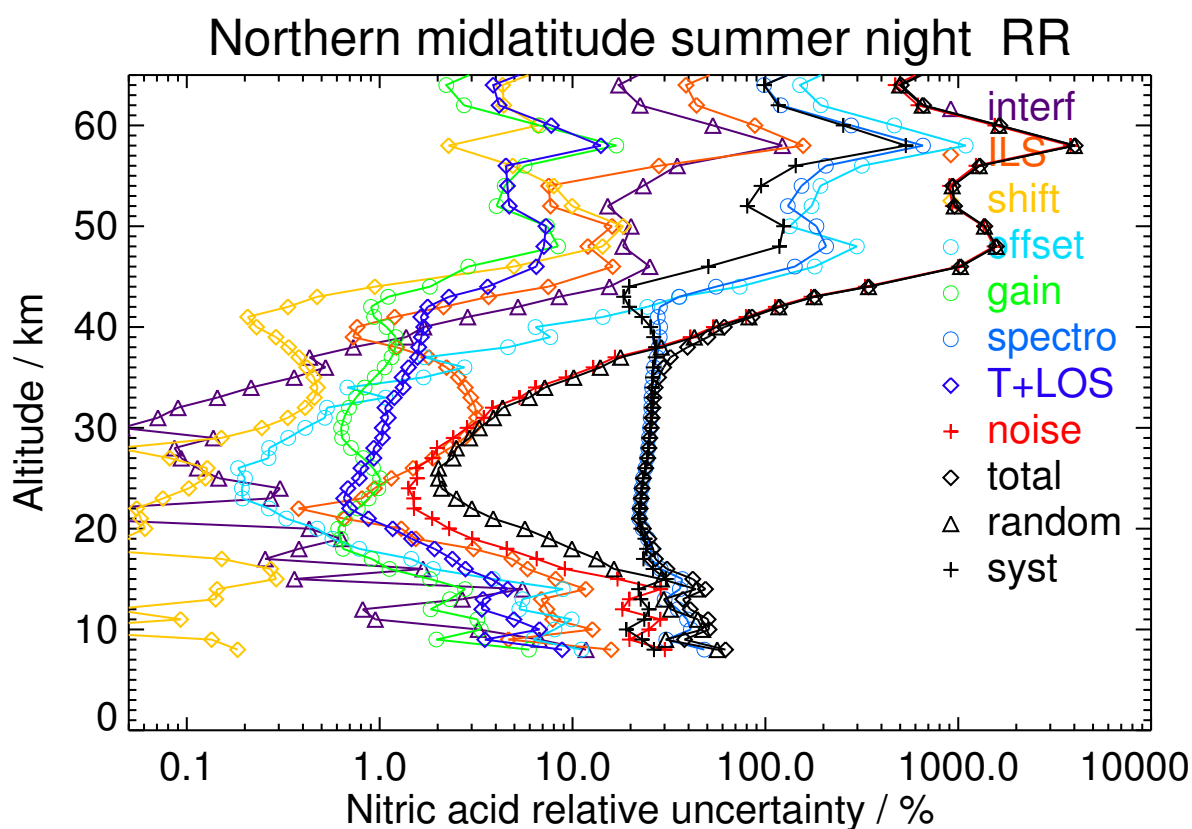


Figure S48: V8R_HNO₃_261 Northern midlatitude summer night

Table S53: HNO₃ error budget for Northern midlatitude autumn day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.17	3.09	44.58	1.98	17.33	4.46	47.86	7.34	53.47	81.48	29.76	86.74
11	0.28	1.07	8.55	0.43	6.30	2.06	36.79	3.72	26.60	40.84	22.92	46.83
14	0.31	1.23	10.95	1.10	8.79	2.65	36.39	4.17	28.22	41.29	25.29	48.42
17	1.36	0.31	6.62	0.38	1.88	0.90	29.27	2.74	6.98	15.62	26.79	31.01
20	4.96	0.05	0.90	0.11	0.50	0.64	23.61	1.12	2.09	7.04	22.69	23.76
23	8.02	0.02	0.83	0.11	0.20	0.86	22.83	0.70	1.50	3.93	22.58	22.92
26	8.32	0.03	1.37	0.07	0.10	0.92	23.50	0.69	1.31	2.38	23.48	23.60
29	6.26	0.01	2.67	0.24	0.27	0.77	25.09	1.04	2.20	3.19	25.16	25.36
32	3.52	0.02	3.24	0.50	0.45	0.86	26.41	1.24	3.81	4.78	26.51	26.94
35	1.65	0.06	2.34	0.41	1.57	1.04	26.80	1.43	10.21	11.03	26.69	28.88
38	0.67	0.16	0.95	0.22	3.94	1.10	26.79	1.51	28.24	29.20	26.13	39.18
41	0.23	0.71	1.33	0.34	15.74	1.05	26.54	1.87	89.31	91.73	22.84	94.53

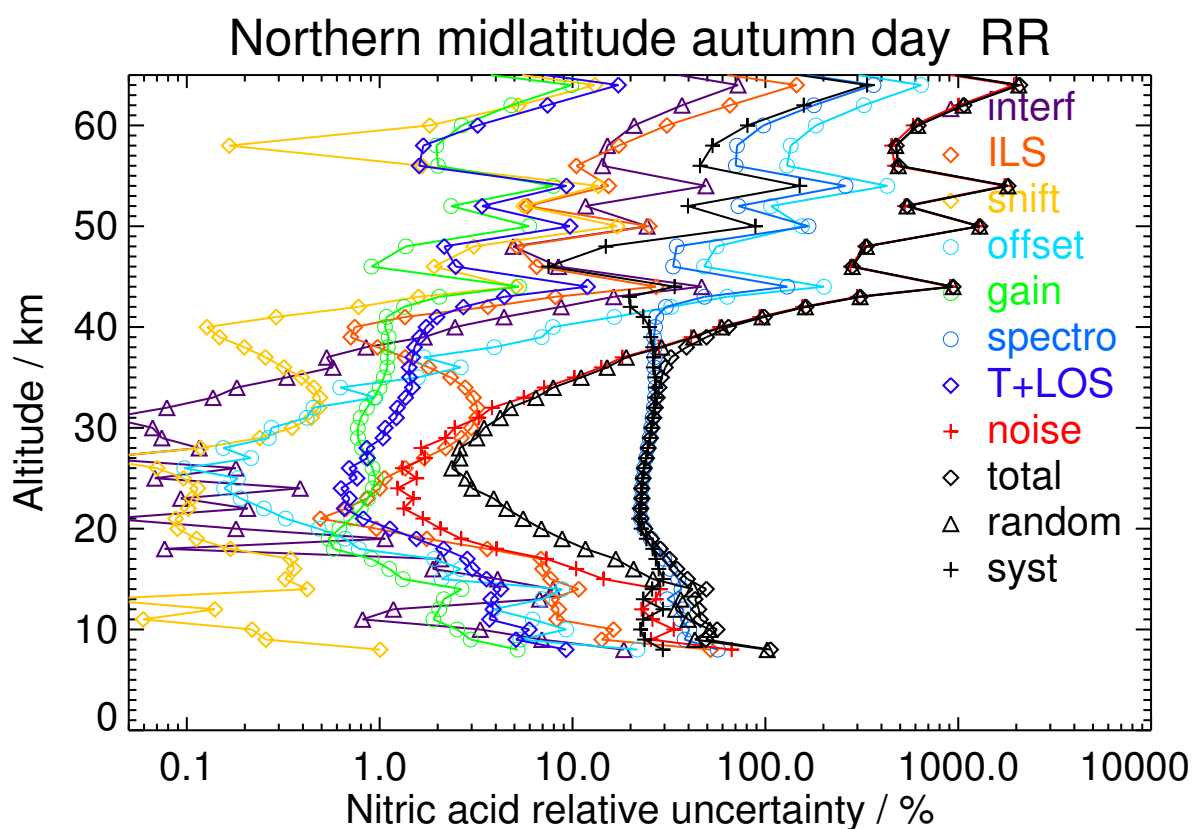


Figure S49: V8R_HNO₃_261 Northern midlatitude autumn day

Table S54: HNO₃ error budget for Northern midlatitude autumn night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.23	2.02	8.72	0.58	12.65	3.74	40.23	5.68	35.47	49.65	26.43	56.25
11	0.26	1.41	10.50	0.60	9.67	2.84	45.50	5.39	30.47	47.84	30.87	56.93
14	0.34	1.22	10.36	0.59	6.87	2.34	37.26	4.62	24.95	37.68	27.82	46.84
17	1.85	0.21	4.57	0.26	1.18	0.73	25.87	2.12	4.97	12.54	23.75	26.86
20	5.48	0.07	0.87	0.12	0.48	0.63	23.38	1.06	1.89	6.90	22.48	23.51
23	8.48	0.04	0.96	0.11	0.21	0.86	22.95	0.71	1.38	3.79	22.73	23.04
26	8.48	0.02	1.50	0.07	0.13	0.93	23.80	0.75	1.34	3.18	23.70	23.91
29	6.04	0.02	2.99	0.27	0.28	0.79	25.36	1.10	2.22	3.31	25.46	25.67
32	3.30	0.02	3.45	0.51	0.52	0.86	26.35	1.29	4.10	5.16	26.45	26.95
35	1.53	0.06	2.62	0.40	1.73	1.03	26.94	1.47	11.08	12.12	26.74	29.36
38	0.63	0.17	1.37	0.23	4.31	1.08	26.79	1.53	29.93	31.19	25.79	40.47
41	0.21	0.80	1.90	0.42	17.85	1.10	28.29	2.10	99.48	> 100	22.98	> 100

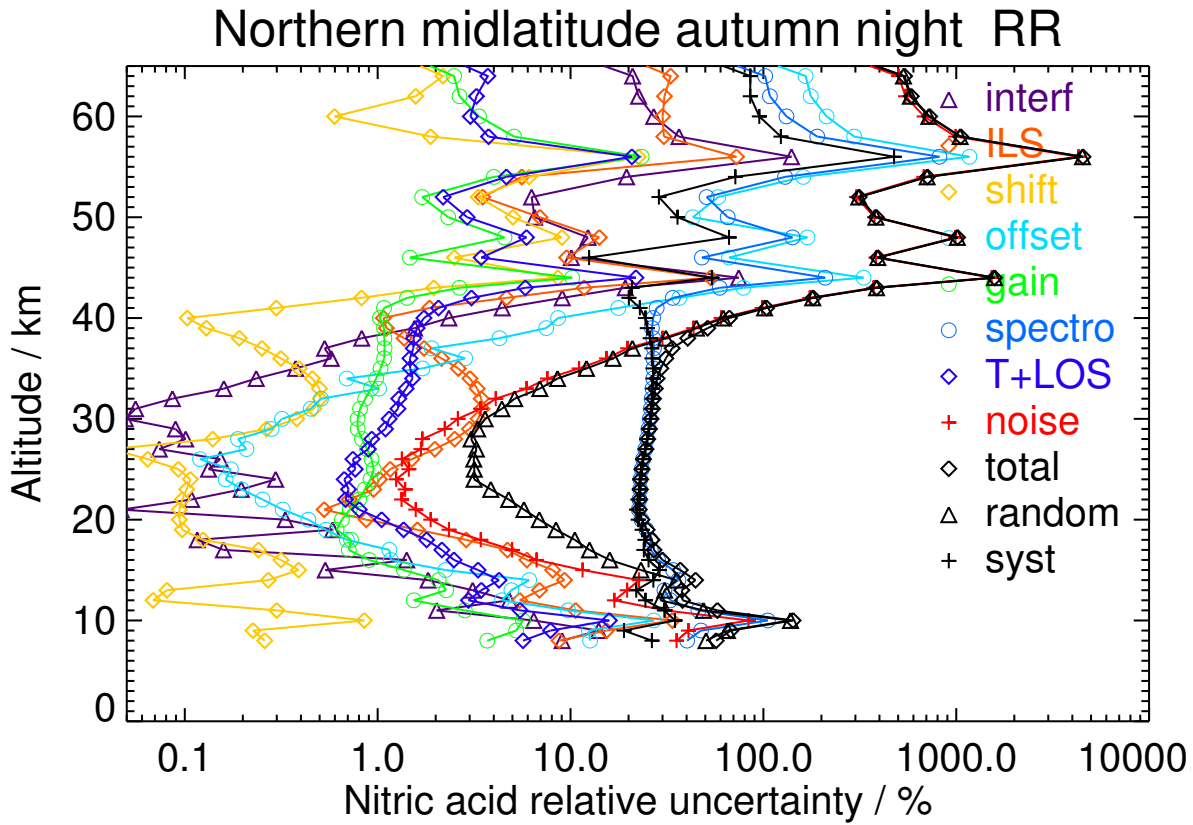


Figure S50: V8R_HNO3_261 Northern midlatitude autumn night

Table S55: HNO₃ error budget for Tropics day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
11	0.10	2.55	17.07	0.38	23.64	7.82	52.83	9.76	75.41	93.75	26.50	97.42
14	0.12	1.88	8.82	0.36	18.21	3.11	43.38	6.14	69.32	79.94	27.51	84.54
17	0.09	2.14	17.43	1.22	18.58	2.74	76.57	14.42	96.37	> 100	40.79	> 100
20	1.23	0.24	4.37	0.17	1.23	0.87	30.29	2.54	7.12	15.67	27.40	31.56
23	3.50	0.05	0.65	0.11	0.31	0.96	25.90	0.74	2.73	12.07	23.12	26.08
26	3.67	0.06	1.94	0.14	0.27	0.81	25.75	0.80	2.73	8.80	24.46	25.99
29	3.40	0.03	2.25	0.15	0.43	0.63	25.14	0.84	3.65	6.27	24.75	25.53
32	2.48	0.03	3.20	0.47	0.47	0.64	25.82	1.01	5.29	6.21	25.85	26.59
35	1.45	0.05	2.41	0.53	1.36	0.84	25.86	1.20	10.24	10.89	25.79	28.00
38	0.64	0.17	1.33	0.40	4.03	1.01	27.30	1.43	26.89	27.79	26.78	38.59
41	0.24	0.66	0.89	0.29	15.55	0.76	30.14	1.64	76.82	79.81	26.20	84.00

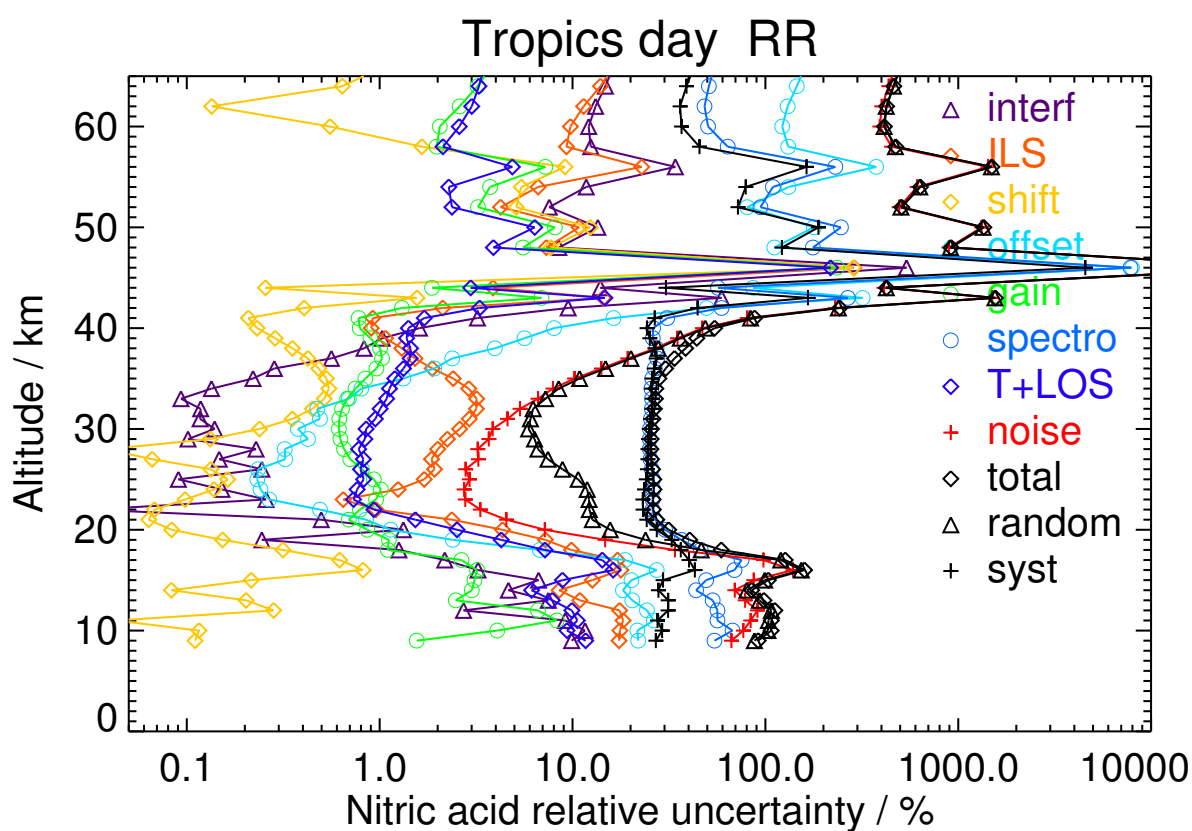


Figure S51: V8R_HNO₃_261 Tropics day

Table S56: HNO₃ error budget for Tropics night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
11	0.12	1.86	6.76	0.36	16.31	1.68	36.18	6.13	54.41	63.53	24.27	68.01
14	0.14	1.76	9.93	0.71	14.79	1.31	39.55	5.70	62.86	71.00	28.81	76.63
17	0.08	2.42	15.05	1.38	24.35	3.53	70.27	15.90	> 100	> 100	44.44	> 100
20	1.38	0.21	3.86	0.09	1.23	0.69	28.96	2.40	6.50	14.62	26.27	30.06
23	3.33	0.06	0.99	0.12	0.31	0.89	25.37	0.77	2.87	10.56	23.30	25.58
26	3.52	0.06	1.75	0.11	0.24	0.79	24.96	0.82	2.92	6.81	24.28	25.22
29	3.11	0.03	2.38	0.17	0.42	0.67	25.50	0.87	3.87	6.47	25.11	25.93
32	2.41	0.03	2.78	0.41	0.49	0.69	25.42	0.96	5.48	6.30	25.42	26.19
35	1.51	0.05	2.10	0.49	1.18	0.93	25.86	1.12	9.73	10.32	25.79	27.78
38	0.69	0.15	0.99	0.37	3.62	1.09	27.52	1.44	25.11	26.01	27.00	37.49
41	0.28	0.57	0.70	0.26	13.46	0.77	28.84	1.49	67.62	69.94	26.41	74.76

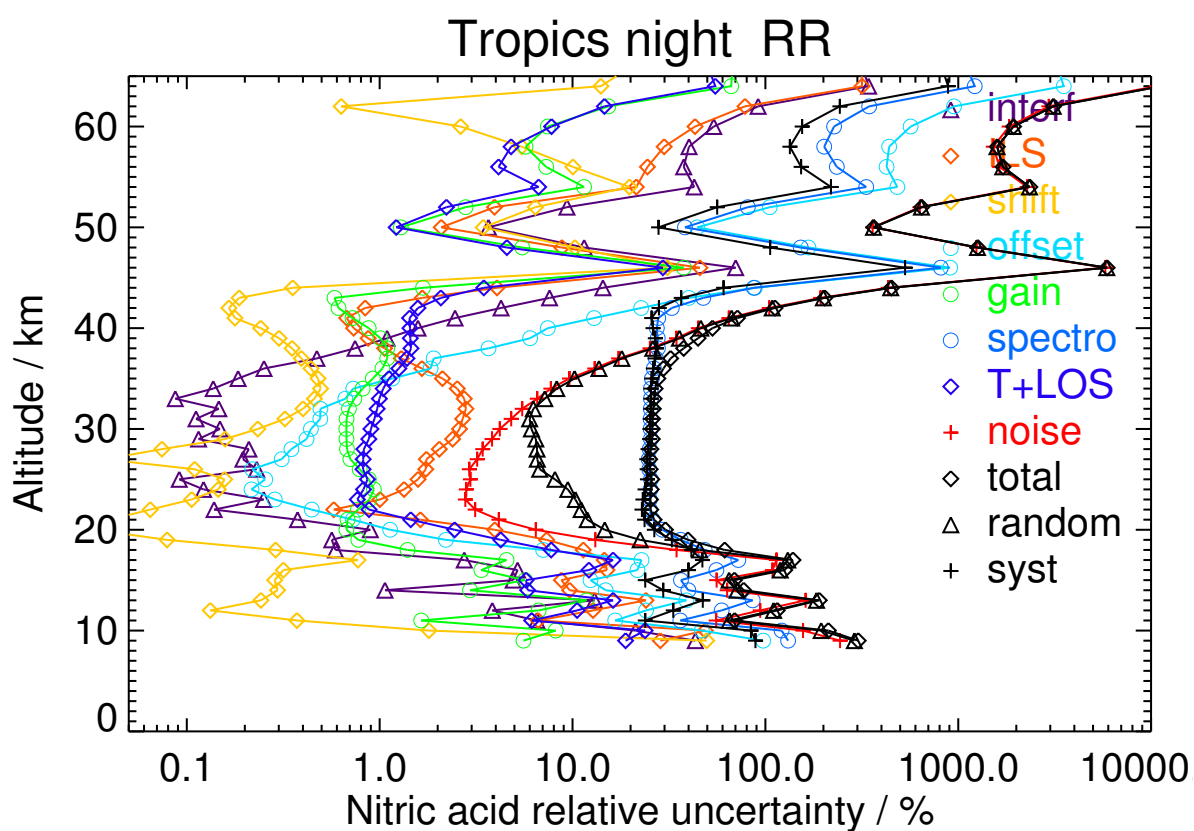


Figure S52: V8R_HNO₃.261 Tropics night

Table S57: HNO₃ error budget for Southern midlatitude winter day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.05	9.36	> 100	7.22	43.72	54.97	> 100	64.58	> 100	> 100	> 100	> 100
11	2.04	0.26	3.29	0.21	1.10	1.46	26.49	2.09	4.34	14.19	23.19	27.19
14	2.09	0.23	2.14	0.12	0.89	1.33	28.54	1.77	4.11	15.10	24.77	29.01
17	4.72	0.09	1.27	0.10	0.55	0.46	25.19	1.36	2.09	9.38	23.55	25.35
20	8.38	0.04	1.13	0.09	0.25	0.61	23.74	0.77	1.38	5.99	23.06	23.83
23	11.03	0.03	1.31	0.13	0.13	0.68	23.59	0.70	1.15	4.26	23.29	23.67
26	11.02	0.02	1.79	0.09	0.16	1.00	24.19	0.91	1.33	2.85	24.16	24.33
29	7.22	0.01	2.86	0.29	0.29	1.12	26.32	1.36	2.16	3.77	26.36	26.63
32	3.43	0.02	3.16	0.37	0.65	1.14	28.35	1.69	5.14	7.90	27.97	29.06
35	1.41	0.10	3.45	0.39	2.08	1.11	30.51	2.04	14.88	18.47	28.86	34.26
38	0.53	0.45	3.42	0.66	7.14	1.02	31.03	3.38	42.57	47.37	24.64	53.39
41	0.12	2.97	27.07	4.96	51.07	2.03	65.06	17.42	> 100	> 100	30.29	> 100

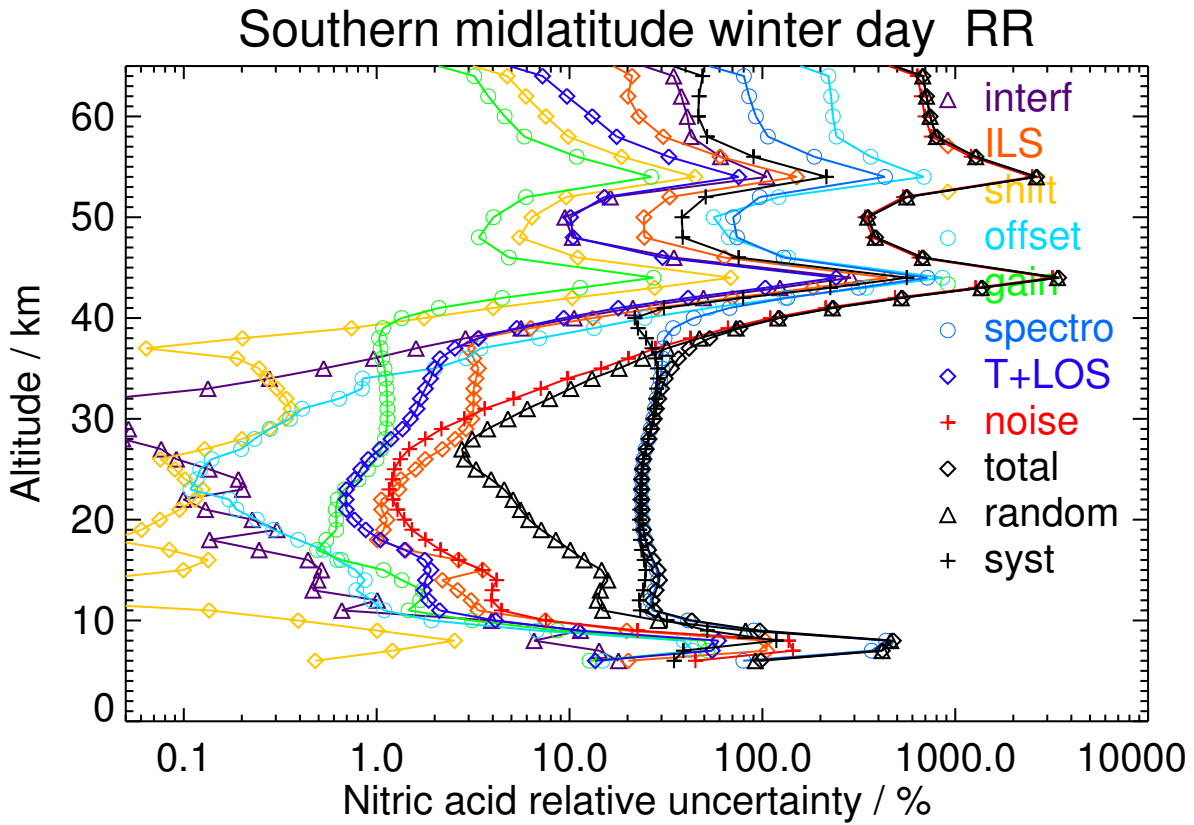


Figure S53: V8R_HNO₃_261 Southern midlatitude winter day

Table S58: HNO₃ error budget for Southern midlatitude winter night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	-0.41	1.27	12.49	0.75	4.22	3.07	59.82	8.44	17.15	50.82	39.33	64.26
11	2.66	0.28	3.36	0.17	0.92	0.96	24.45	1.92	3.54	15.92	19.34	25.05
14	1.80	0.41	4.10	0.23	1.24	2.34	26.43	2.30	4.87	17.63	21.00	27.42
17	4.56	0.09	1.97	0.14	0.57	0.69	20.99	1.49	2.16	7.48	19.90	21.26
20	8.04	0.04	0.86	0.08	0.25	0.67	21.23	0.79	1.42	4.96	20.74	21.33
23	11.23	0.02	1.00	0.12	0.14	0.64	21.79	0.68	1.17	3.89	21.51	21.86
26	11.49	0.02	1.70	0.10	0.13	0.93	23.42	0.84	1.19	2.80	23.38	23.55
29	7.37	0.01	2.75	0.27	0.30	1.05	26.62	1.34	2.21	3.92	26.62	26.91
32	3.55	0.03	3.42	0.44	0.50	0.96	29.43	1.68	4.67	7.30	29.16	30.06
35	1.44	0.09	2.92	0.35	1.44	0.90	28.26	1.92	13.40	16.59	26.80	31.52
38	0.51	0.38	3.85	0.61	6.47	1.00	23.30	2.90	41.13	46.16	13.09	47.98
41	0.19	1.47	16.59	2.48	29.98	1.75	58.29	7.39	> 100	> 100	39.68	> 100

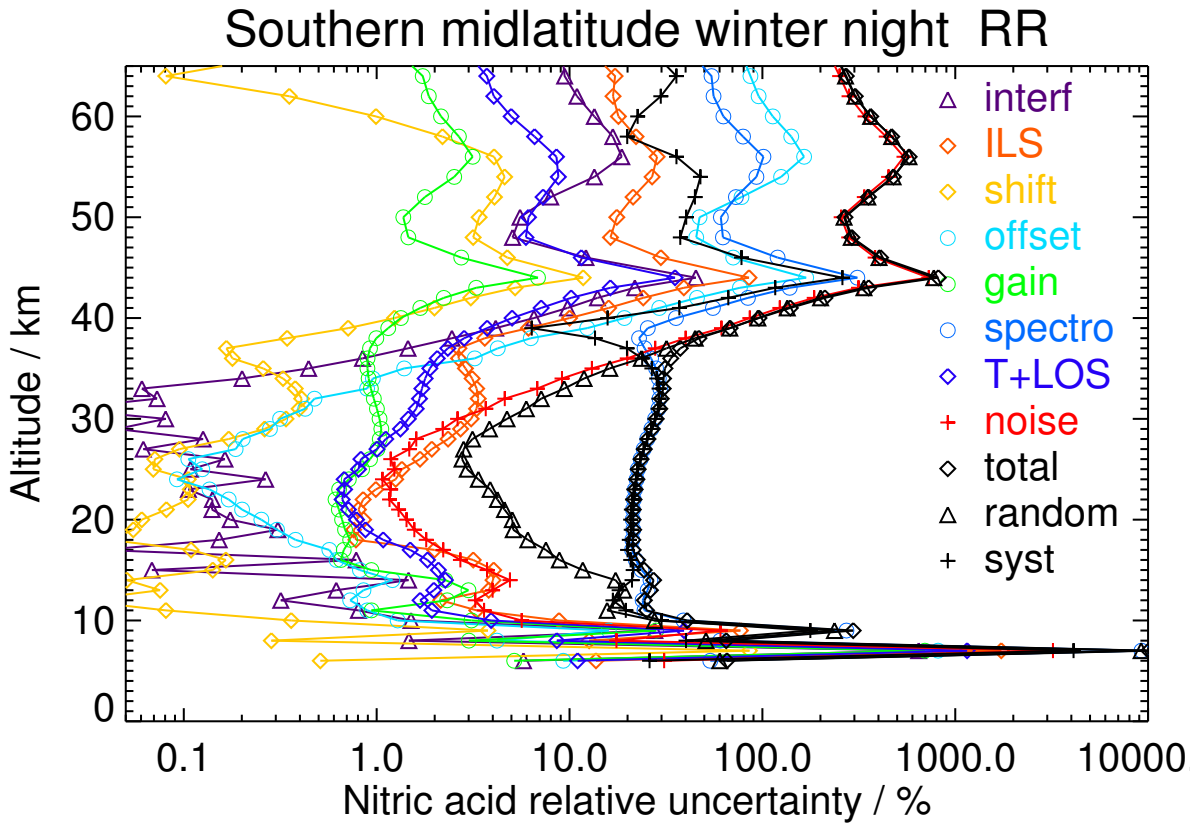


Figure S54: V8R_HNO3_261 Southern midlatitude winter night

Table S59: HNO₃ error budget for Southern midlatitude spring day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	-0.09	5.18	63.04	2.22	26.87	10.63	> 100	29.97	90.90	> 100	96.37	> 100
11	1.42	0.51	6.14	0.21	1.52	1.32	24.40	2.57	6.28	15.03	21.39	26.15
14	1.82	0.36	4.09	0.16	1.09	1.56	27.72	1.98	4.71	17.25	22.76	28.55
17	4.15	0.14	3.42	0.16	0.72	1.03	24.20	1.77	2.23	11.20	21.95	24.64
20	8.35	0.07	1.08	0.08	0.30	1.10	21.26	0.76	1.15	4.68	20.84	21.36
23	8.66	0.07	1.23	0.09	0.15	1.08	22.65	0.75	1.18	3.68	22.45	22.75
26	7.07	0.03	1.49	0.07	0.22	1.03	24.26	0.83	1.52	4.77	23.92	24.39
29	4.86	0.03	2.27	0.21	0.36	0.74	25.28	1.00	2.52	5.94	24.84	25.54
32	3.23	0.02	2.67	0.36	0.51	0.88	25.96	0.98	3.92	6.43	25.63	26.43
35	1.57	0.06	2.50	0.39	1.67	1.15	27.88	1.38	10.24	12.30	27.26	29.91
38	0.53	0.20	1.25	0.31	4.94	1.44	28.84	1.84	33.95	35.80	27.09	44.89
41	0.13	1.27	7.06	0.79	26.68	2.26	41.44	3.40	> 100	> 100	17.23	> 100

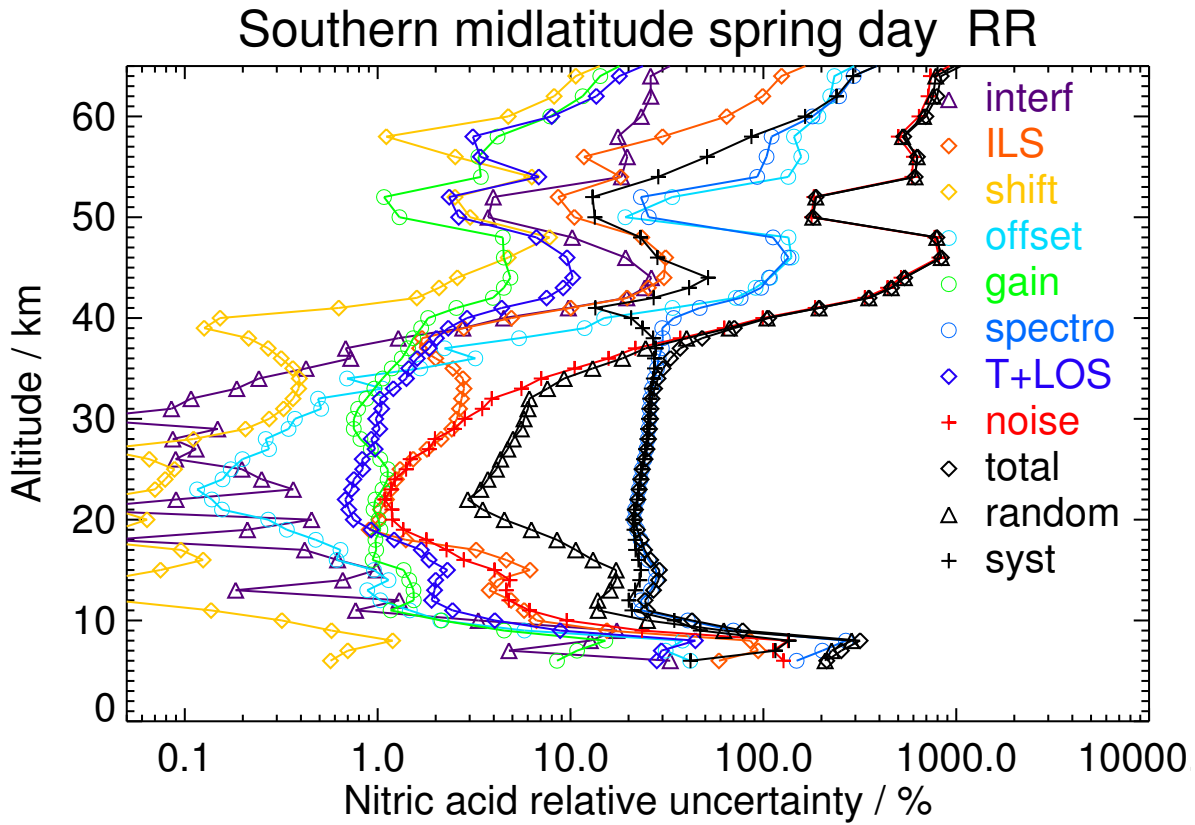


Figure S55: V8R_HNO₃_261 Southern midlatitude spring day

Table S60: HNO₃ error budget for Southern midlatitude spring night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.04	10.62	> 100	4.32	38.19	35.46	> 100	47.23	> 100	> 100	91.95	> 100
11	1.31	0.63	5.36	0.23	1.53	1.32	25.57	2.31	6.64	16.17	21.79	27.14
14	1.57	0.47	5.34	0.23	1.22	1.40	27.75	2.16	5.31	16.18	23.95	28.90
17	4.23	0.13	2.83	0.14	0.63	1.05	24.77	1.68	2.22	10.81	22.67	25.11
20	7.41	0.06	1.34	0.08	0.33	1.03	23.80	0.79	1.37	8.49	22.36	23.91
23	8.41	0.06	1.32	0.09	0.14	1.06	23.52	0.77	1.28	4.53	23.19	23.63
26	6.50	0.03	2.08	0.09	0.21	1.06	25.39	0.93	1.64	6.85	24.63	25.56
29	4.29	0.03	3.03	0.28	0.40	0.80	26.34	1.10	2.93	8.25	25.40	26.71
32	2.72	0.03	3.08	0.43	0.54	0.90	26.41	1.08	4.61	8.84	25.54	27.03
35	1.30	0.08	2.52	0.40	1.74	1.23	28.42	1.42	12.16	15.27	27.12	31.12
38	0.53	0.22	1.73	0.28	4.78	1.33	26.35	1.64	33.26	35.17	24.38	42.79
41	0.06	3.38	21.03	2.31	63.61	5.29	66.25	8.75	> 100	> 100	36.56	> 100

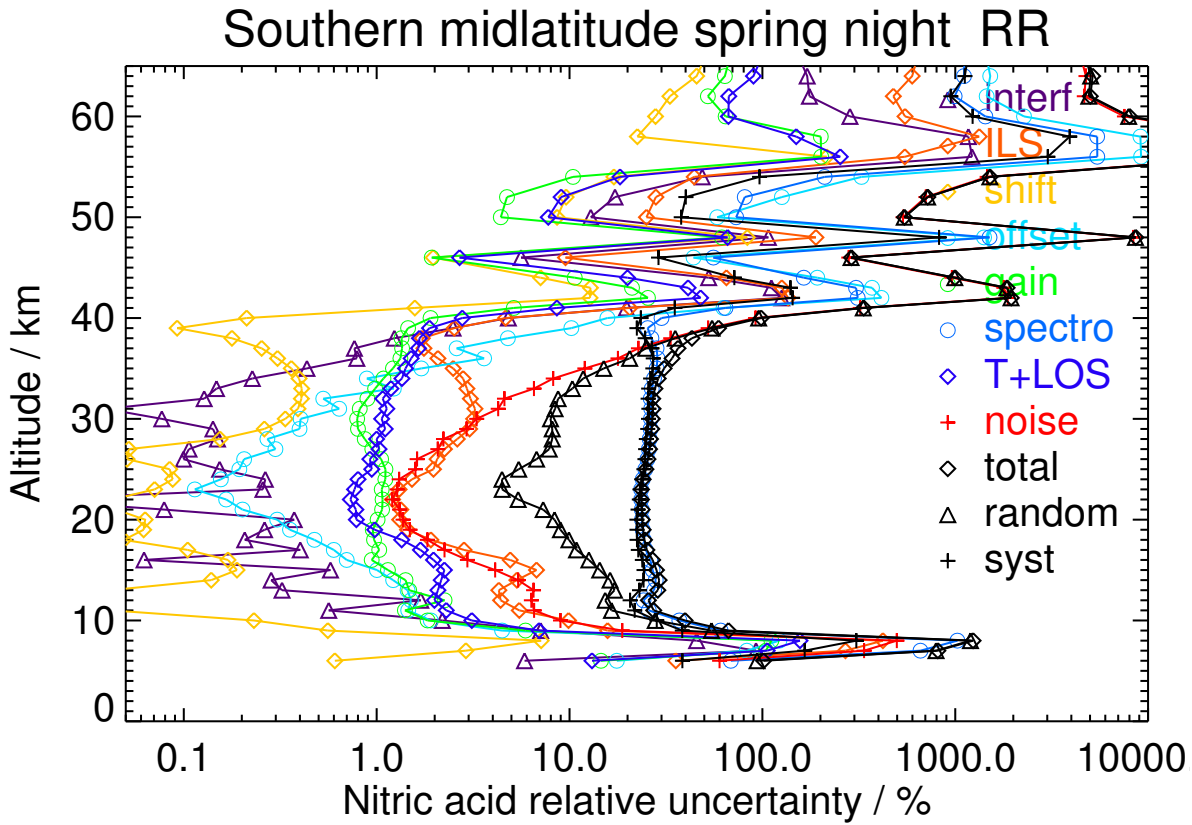


Figure S56: V8R_HNO₃_261 Southern midlatitude spring night

Table S61: HNO₃ error budget for Southern midlatitude summer day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.10	6.27	46.58	1.42	18.58	6.76	> 100	27.81	67.37	> 100	44.16	> 100
11	1.05	0.85	5.48	0.18	1.96	1.76	24.63	2.76	7.09	16.13	21.02	26.50
14	1.33	0.58	3.07	0.11	1.88	1.29	25.54	1.55	5.90	14.35	22.33	26.55
17	1.87	0.34	3.17	0.11	1.28	0.98	23.65	1.64	4.58	10.53	22.02	24.41
20	4.66	0.10	0.97	0.07	0.40	0.81	22.31	0.94	1.96	4.56	21.99	22.45
23	6.89	0.06	0.88	0.07	0.20	1.01	22.72	0.70	1.55	2.54	22.68	22.82
26	6.72	0.05	1.42	0.13	0.16	0.88	23.67	0.73	1.43	2.12	23.69	23.78
29	5.07	0.02	2.97	0.19	0.45	0.54	24.96	1.05	2.50	2.96	25.11	25.29
32	2.99	0.04	3.67	0.53	0.43	0.56	25.69	1.17	3.78	4.16	25.93	26.27
35	1.42	0.09	2.15	0.49	1.34	0.91	25.52	1.43	9.74	10.31	25.48	27.49
38	0.56	0.21	1.11	0.33	4.12	1.17	25.49	1.56	27.58	28.65	24.72	37.85
41	0.23	0.86	3.68	0.32	15.33	1.13	21.69	1.62	74.18	77.04	17.07	78.91

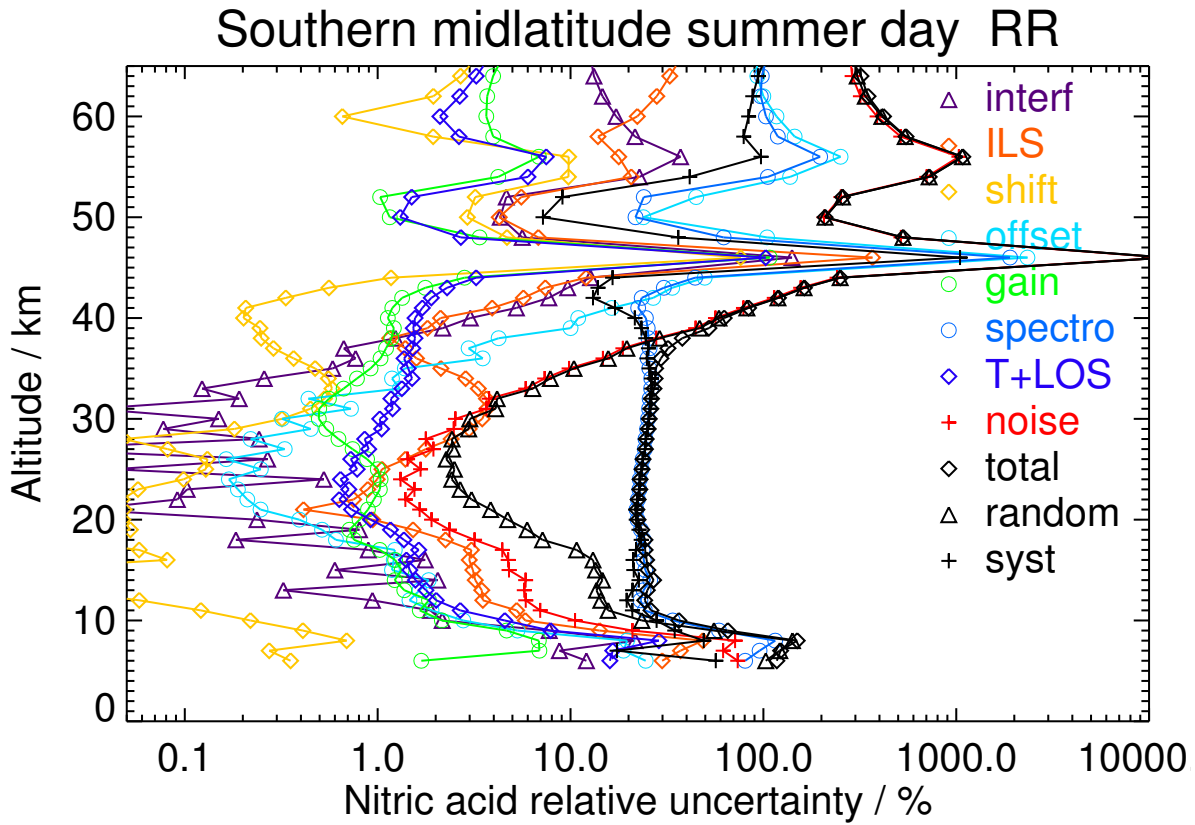


Figure S57: V8R_HNO₃_261 Southern midlatitude summer day

Table S62: HNO₃ error budget for Southern midlatitude summer night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.05	11.71	> 100	4.11	34.88	23.48	> 100	58.56	> 100	> 100	> 100	> 100
11	1.25	0.70	4.58	0.15	1.51	1.09	24.32	2.35	6.50	13.25	22.11	25.78
14	1.25	0.70	2.83	0.13	2.08	1.51	28.96	1.70	6.49	16.10	25.29	29.98
17	2.01	0.31	2.47	0.09	1.25	0.96	26.12	1.57	4.34	10.42	24.57	26.69
20	4.67	0.09	0.95	0.08	0.40	0.67	23.80	0.86	1.94	5.11	23.37	23.93
23	6.88	0.06	0.81	0.06	0.20	1.04	23.39	0.70	1.54	2.47	23.36	23.49
26	6.71	0.06	1.37	0.15	0.15	0.94	23.99	0.74	1.44	2.09	24.02	24.11
29	5.10	0.02	3.32	0.19	0.43	0.61	25.07	1.06	2.44	2.95	25.27	25.44
32	2.97	0.04	3.86	0.53	0.44	0.62	25.46	1.20	3.83	4.27	25.72	26.08
35	1.47	0.08	2.12	0.44	1.04	0.93	25.78	1.44	9.26	9.73	25.78	27.55
38	0.59	0.18	1.37	0.27	3.27	1.17	25.86	1.56	25.05	25.94	25.30	36.23
41	0.21	0.96	4.44	0.31	16.76	0.95	26.44	1.95	79.21	82.49	21.80	85.32

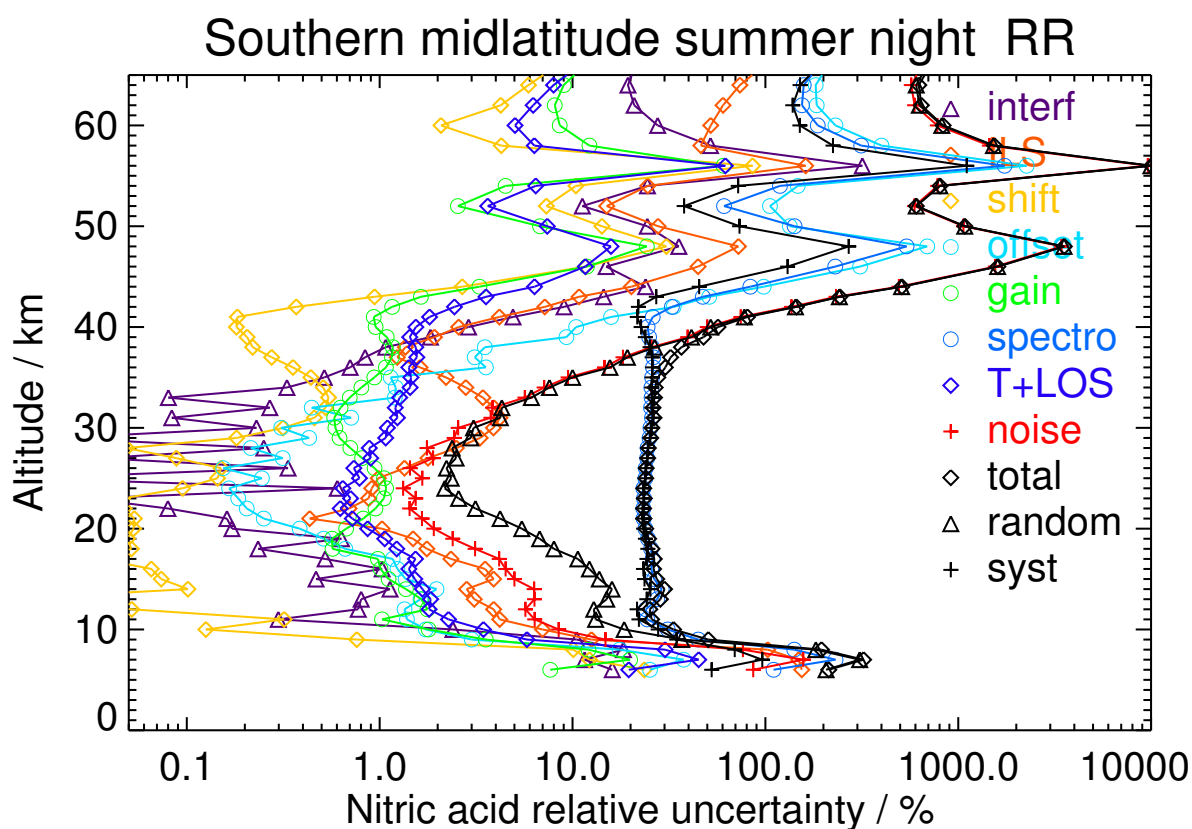


Figure S58: V8R_HNO₃_261 Southern midlatitude summer night

Table S63: HNO₃ error budget for Southern midlatitude autumn day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.24	2.07	24.76	0.82	8.03	6.23	61.86	8.08	28.54	66.86	30.94	73.67
11	0.83	0.99	3.64	0.25	2.20	1.75	25.14	2.16	9.00	16.55	21.59	27.20
14	1.19	0.56	3.60	0.20	1.52	1.24	28.73	1.84	6.54	17.20	24.35	29.81
17	3.22	0.18	1.83	0.11	0.61	0.55	25.05	1.42	2.72	10.62	22.99	25.32
20	6.93	0.06	0.80	0.10	0.28	0.54	23.20	0.78	1.47	6.38	22.39	23.28
23	9.79	0.06	1.08	0.14	0.14	0.80	23.23	0.63	1.14	4.25	22.92	23.31
26	9.56	0.02	1.52	0.06	0.15	1.00	24.14	0.79	1.32	3.32	24.03	24.26
29	6.53	0.02	2.67	0.28	0.24	0.98	25.63	1.11	2.02	3.78	25.61	25.89
32	3.65	0.02	2.98	0.44	0.56	1.07	26.45	1.31	3.99	4.91	26.53	26.98
35	1.52	0.08	2.54	0.42	1.83	1.29	28.24	1.70	11.72	12.80	28.02	30.81
38	0.53	0.26	1.47	0.26	5.60	1.28	29.08	1.89	37.15	39.29	26.85	47.59
41	0.26	0.80	2.47	0.49	16.43	0.72	23.09	1.97	82.96	86.44	14.99	87.73

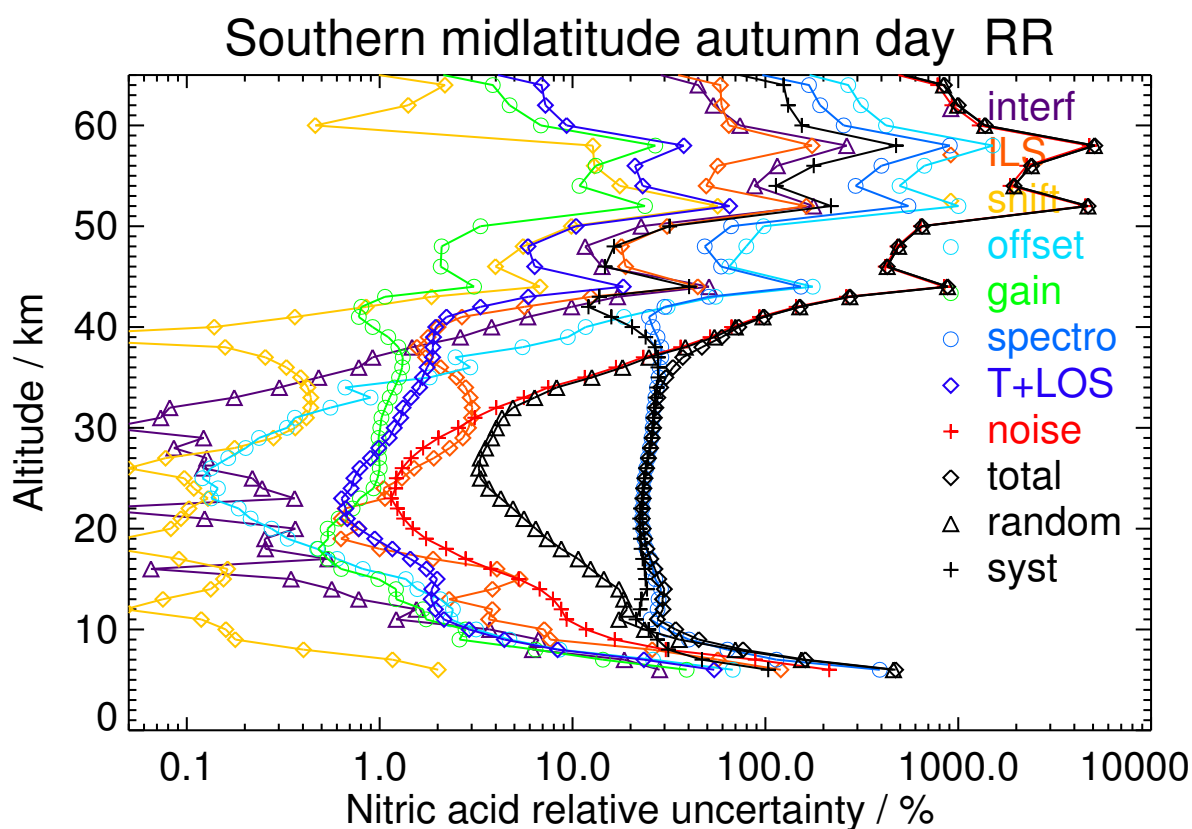


Figure S59: V8R_HNO₃_261 Southern midlatitude autumn day

Table S64: HNO₃ error budget for Southern midlatitude autumn night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
8	0.06	8.71	50.13	2.35	27.83	27.04	> 100	26.47	> 100	> 100	71.48	> 100
11	0.72	1.30	4.88	0.20	2.94	1.35	22.46	2.39	11.69	18.25	18.70	26.13
14	1.00	0.69	4.11	0.23	2.19	0.88	29.14	1.86	8.25	17.84	25.01	30.72
17	3.00	0.16	2.40	0.12	0.75	0.49	23.52	1.49	3.07	7.83	22.58	23.90
20	6.66	0.05	0.64	0.09	0.33	0.65	22.64	0.85	1.56	6.17	21.88	22.73
23	9.91	0.03	0.87	0.12	0.16	0.85	22.57	0.65	1.20	5.02	22.08	22.64
26	9.73	0.03	1.54	0.07	0.10	0.98	23.59	0.74	1.19	3.44	23.45	23.70
29	6.64	0.01	2.79	0.28	0.27	0.88	25.45	1.11	2.11	3.62	25.48	25.74
32	3.57	0.03	3.26	0.52	0.41	0.94	26.51	1.34	3.81	5.44	26.49	27.04
35	1.45	0.08	2.79	0.48	1.22	1.17	28.25	1.75	11.38	13.39	27.61	30.69
38	0.53	0.28	1.45	0.30	4.51	1.22	26.70	1.90	34.36	37.35	22.95	43.83
41	0.15	1.55	7.42	1.21	28.49	1.38	27.67	3.74	> 100	> 100	9.48	> 100

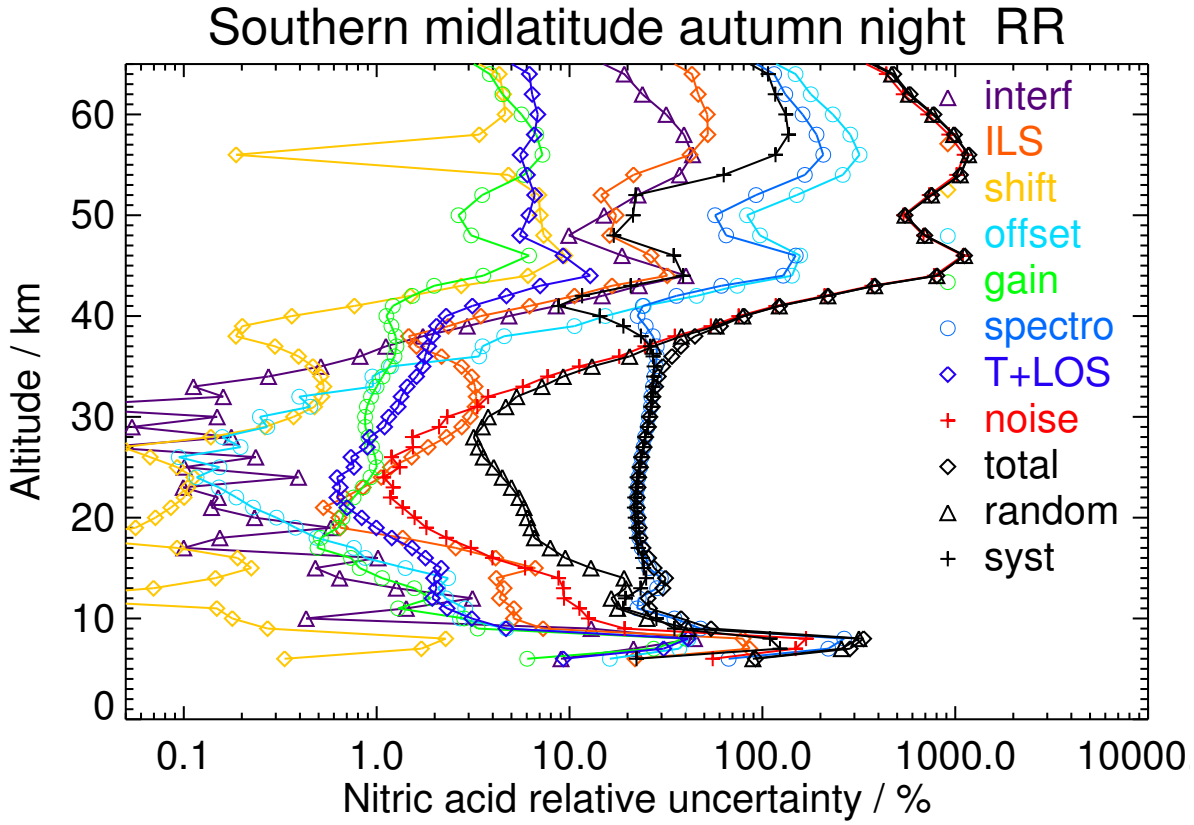


Figure S60: V8R_HNO₃_261 Southern midlatitude autumn night

Table S65: HNO₃ error budget for Southern polar winter day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.19	4.29	16.55	1.27	17.40	6.28	75.09	16.66	47.94	84.65	41.04	94.08
8	0.87	0.60	7.31	0.60	2.51	2.76	40.60	5.58	8.29	30.79	29.47	42.62
11	2.72	0.19	2.17	0.12	0.54	1.20	24.52	1.97	3.02	8.28	23.50	24.92
14	3.39	0.11	2.76	0.15	0.65	1.19	26.19	2.28	2.83	11.22	24.13	26.62
17	6.10	0.03	0.97	0.07	0.49	1.02	24.69	1.31	1.86	10.33	22.59	24.84
20	7.06	0.03	1.78	0.11	0.26	0.94	27.82	1.01	1.85	13.59	24.45	27.97
23	9.06	0.03	2.01	0.12	0.17	0.79	24.78	0.96	1.51	8.92	23.28	24.93
26	7.01	0.01	3.24	0.28	0.32	1.03	26.36	1.37	2.33	7.08	25.76	26.72
29	3.62	0.02	4.13	0.45	0.49	0.95	28.33	1.71	4.32	9.75	27.34	29.03
32	1.76	0.05	3.20	0.26	1.44	0.65	28.38	1.65	10.58	15.03	26.59	30.54
35	0.79	0.23	1.91	0.39	4.66	0.99	29.01	2.38	26.88	30.34	26.00	39.96
38	0.37	0.66	4.75	0.98	11.57	1.92	29.39	5.25	61.38	64.82	24.87	69.43
41	0.15	1.93	22.57	2.96	43.08	5.37	56.90	15.04	> 100	> 100	43.52	> 100

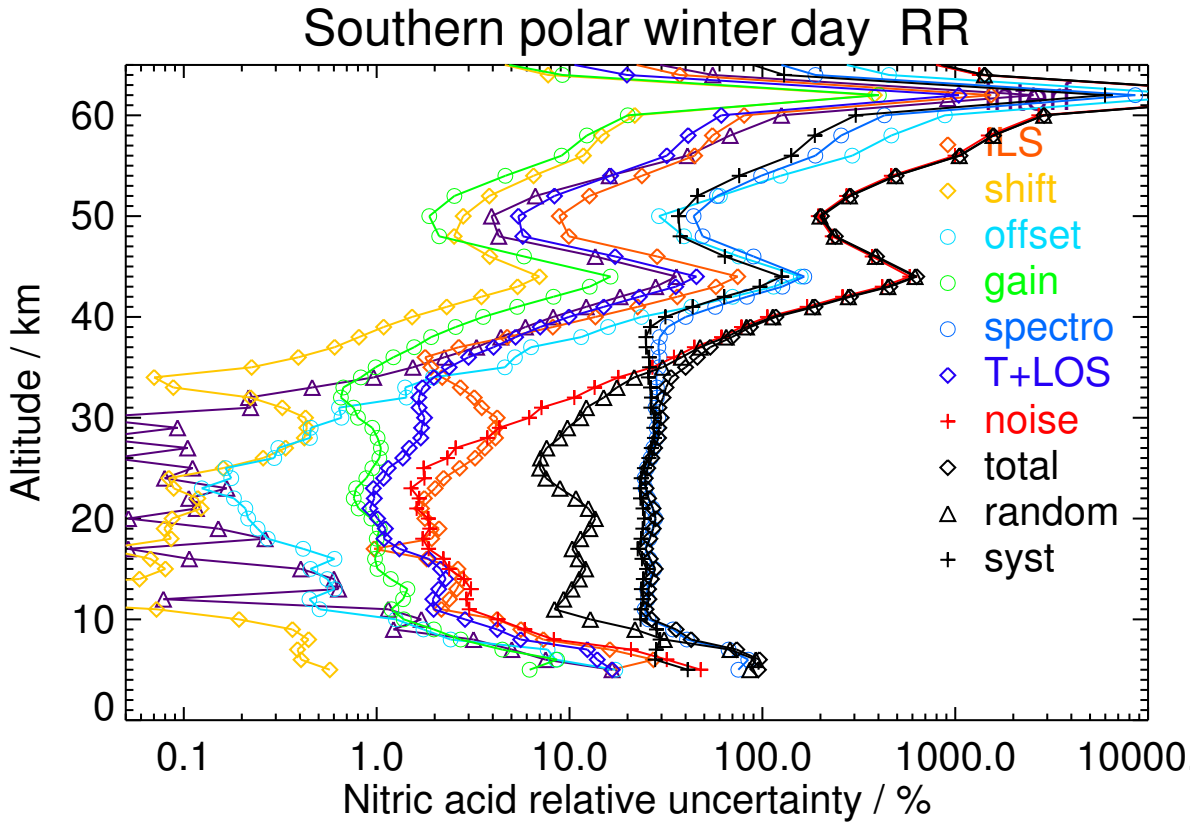


Figure S61: V8R_HNO₃_261 Southern polar winter day

Table S66: HNO₃ error budget for Southern polar winter night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.07	9.44	77.89	3.65	46.64	13.49	> 100	50.01	> 100	> 100	64.27	> 100
8	0.37	1.34	17.71	1.20	7.13	4.73	76.01	12.02	20.89	74.58	34.44	82.14
11	2.47	0.22	2.16	0.16	0.60	1.31	20.86	2.04	3.32	10.81	18.45	21.38
14	3.00	0.11	2.76	0.19	0.54	1.05	20.48	2.19	3.05	7.84	19.52	21.04
17	6.42	0.06	1.04	0.11	0.47	0.94	20.23	1.49	1.68	6.89	19.21	20.41
20	8.27	0.04	1.40	0.11	0.29	0.92	22.59	0.98	1.51	8.83	20.94	22.73
23	9.99	0.04	1.66	0.11	0.14	0.70	23.62	0.87	1.32	8.16	22.30	23.74
26	8.23	0.01	3.14	0.28	0.28	0.95	25.75	1.31	1.98	7.37	25.01	26.07
29	3.92	0.02	4.73	0.49	0.55	0.98	29.73	1.89	4.03	9.93	28.80	30.46
32	1.93	0.04	3.71	0.33	1.21	0.60	28.08	1.67	9.32	12.77	27.03	29.89
35	0.93	0.14	2.58	0.37	3.36	0.55	26.11	1.81	22.38	26.20	22.76	34.71
38	0.28	0.67	5.24	1.18	13.37	1.45	34.21	4.48	81.16	88.32	13.62	89.37
41	-0.01	47.56	> 100	68.99	> 100	84.89	> 100	> 100	> 100	> 100	> 100	> 100

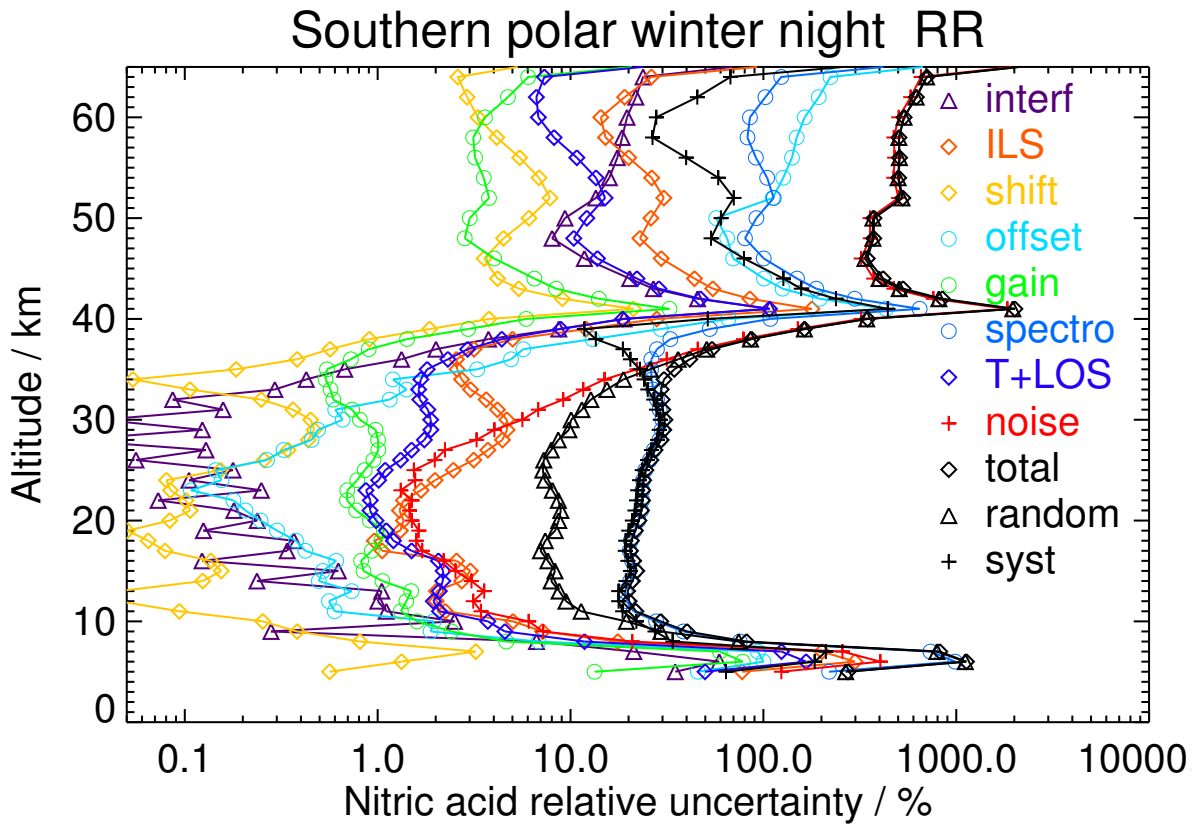


Figure S62: V8R_HNO₃_261 Southern polar winter night

Table S67: HNO₃ error budget for Southern polar spring day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.13	3.93	26.72	0.78	20.86	5.02	69.02	11.68	58.29	94.75	22.60	97.41
8	0.12	9.03	55.46	2.15	18.94	13.56	> 100	26.58	68.62	> 100	> 100	> 100
11	1.75	0.59	4.65	0.16	1.10	1.40	24.59	2.56	4.97	9.94	23.71	25.71
14	2.90	0.27	3.71	0.13	0.80	1.42	27.47	2.13	3.15	15.20	23.54	28.02
17	4.53	0.11	2.68	0.13	0.53	1.08	26.79	1.51	2.11	15.98	21.86	27.07
20	6.04	0.05	1.77	0.08	0.25	1.41	27.00	0.94	1.74	15.70	22.17	27.17
23	7.34	0.09	1.27	0.12	0.22	1.22	23.44	0.71	1.25	7.05	22.47	23.55
26	5.23	0.03	2.78	0.16	0.45	1.11	26.71	1.22	2.38	9.13	25.42	27.01
29	3.62	0.04	2.16	0.19	0.27	0.84	28.06	0.92	2.86	14.65	24.24	28.32
32	2.24	0.03	3.43	0.52	1.36	1.05	30.10	1.07	6.12	16.76	26.05	30.98
35	1.16	0.10	3.80	0.62	3.46	1.23	30.89	1.21	14.08	22.10	26.34	34.39
38	0.42	0.26	2.62	0.57	9.26	1.63	33.18	1.80	44.02	49.04	27.07	56.01
41	0.09	1.72	8.07	0.74	45.29	3.33	42.06	4.22	> 100	> 100	24.62	> 100

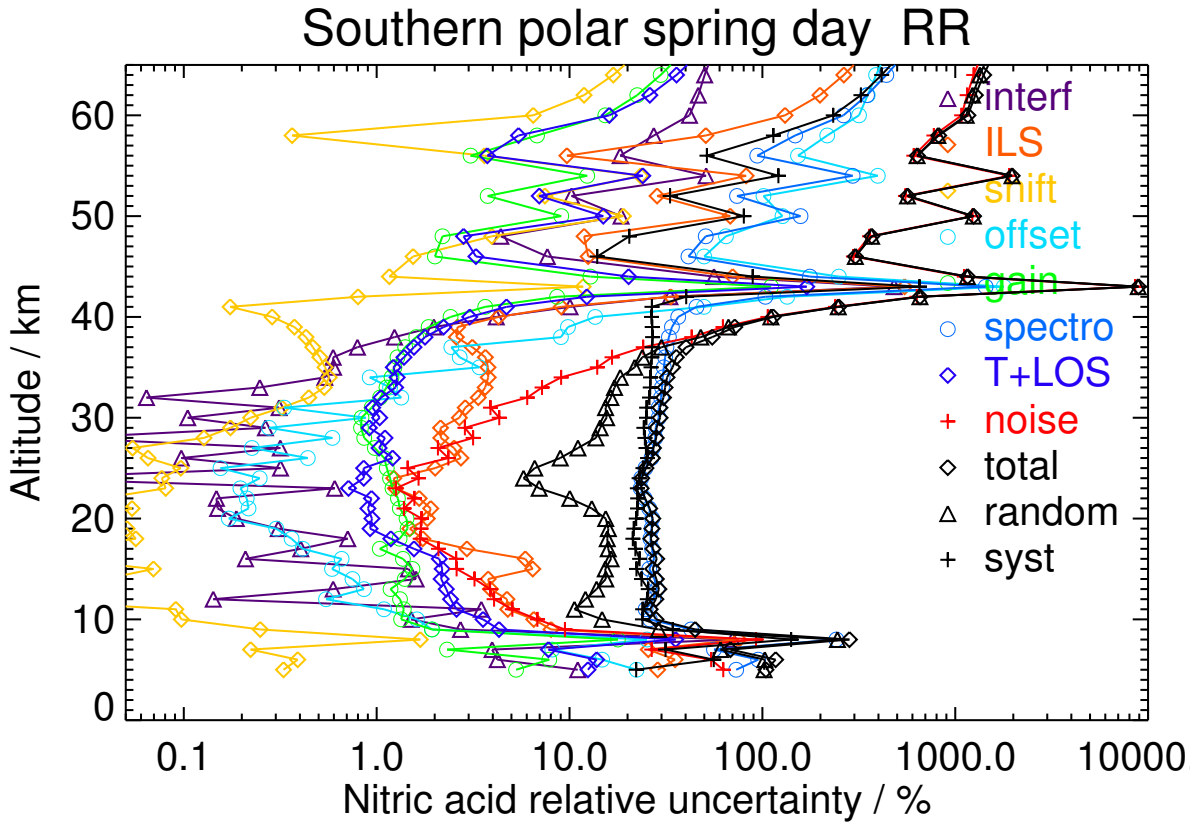


Figure S63: V8R.HNO₃.261 Southern polar spring day

Table S68: HNO₃ error budget for Southern polar spring night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.08	6.96	29.43	1.44	33.83	13.80	90.37	19.30	> 100	> 100	26.61	> 100
8	0.32	3.71	22.92	0.79	7.51	5.84	68.71	11.14	28.22	62.43	48.72	79.19
11	1.95	0.64	3.36	0.13	1.07	1.25	20.32	1.95	4.48	7.98	19.69	21.25
14	3.02	0.34	4.30	0.14	0.86	1.01	25.60	2.26	3.12	13.39	22.61	26.28
17	5.88	0.09	2.83	0.08	0.49	1.02	24.37	1.38	1.68	11.40	21.87	24.66
20	7.40	0.04	2.09	0.07	0.17	1.30	24.89	1.00	1.45	10.32	22.86	25.08
23	7.49	0.06	1.28	0.09	0.18	1.22	24.09	0.73	1.22	6.50	23.31	24.20
26	5.70	0.01	2.44	0.14	0.39	1.10	25.84	1.16	2.22	6.90	25.17	26.10
29	3.76	0.03	2.70	0.23	0.26	0.85	27.34	0.97	2.73	12.08	24.87	27.64
32	2.25	0.03	3.97	0.56	1.36	1.06	28.91	1.18	6.16	14.23	26.30	29.90
35	1.11	0.10	3.49	0.52	3.53	1.16	28.77	1.24	14.64	20.49	25.50	32.71
38	0.45	0.24	3.29	0.50	8.41	1.41	30.96	1.60	40.73	44.93	26.17	52.00
41	0.14	1.13	5.71	0.70	29.37	2.20	30.64	2.86	> 100	> 100	23.69	> 100

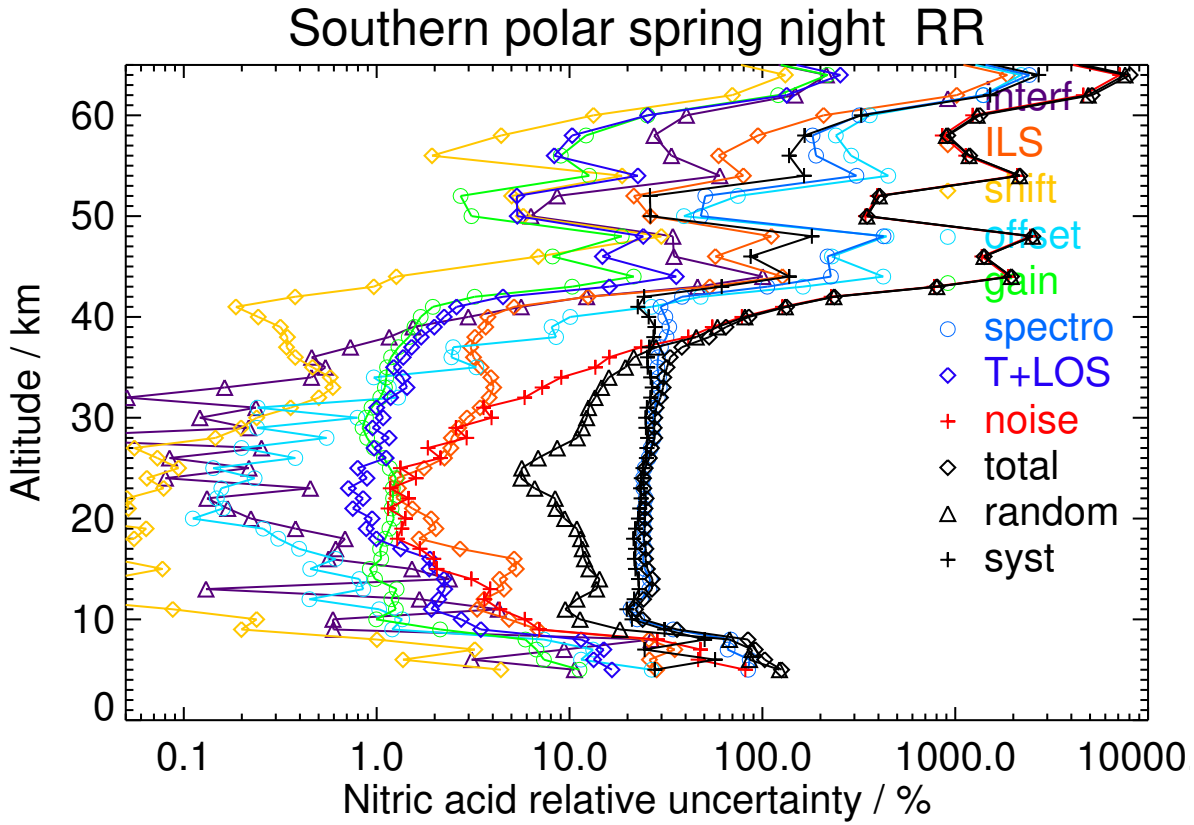


Figure S64: V8R_HNO₃_261 Southern polar spring night

Table S69: HNO₃ error budget for Southern polar summer day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.13	5.51	29.59	1.17	16.98	7.79	79.89	15.63	59.39	> 100	24.24	> 100
8	0.46	4.46	11.02	0.52	4.67	4.49	62.18	7.30	18.16	39.54	53.57	66.58
11	1.52	1.21	3.26	0.09	1.52	1.70	22.09	1.54	4.94	9.71	20.92	23.07
14	1.77	0.63	3.92	0.10	1.46	1.26	21.87	1.50	4.43	7.96	21.36	22.80
17	3.20	0.22	2.14	0.13	0.59	0.38	22.83	1.09	2.58	3.88	22.78	23.11
20	6.32	0.07	0.40	0.04	0.19	0.77	22.23	0.59	1.53	2.30	22.19	22.31
23	8.12	0.12	0.81	0.09	0.16	0.98	22.36	0.50	1.01	1.61	22.37	22.43
26	8.30	0.02	0.96	0.18	0.29	1.05	23.89	0.81	1.54	2.04	23.92	24.00
29	6.52	0.04	2.63	0.10	0.14	0.73	24.70	0.86	1.52	2.84	24.75	24.92
32	3.74	0.01	4.21	0.57	0.84	0.73	26.22	1.21	3.53	5.13	26.35	26.85
35	1.66	0.06	3.47	0.66	2.49	0.92	26.29	1.39	9.33	10.42	26.29	28.28
38	0.63	0.18	0.87	0.39	6.54	1.24	25.22	1.54	28.09	29.40	24.66	38.38
41	0.21	0.76	4.51	0.39	20.20	1.33	23.12	1.89	87.51	91.25	17.33	92.88

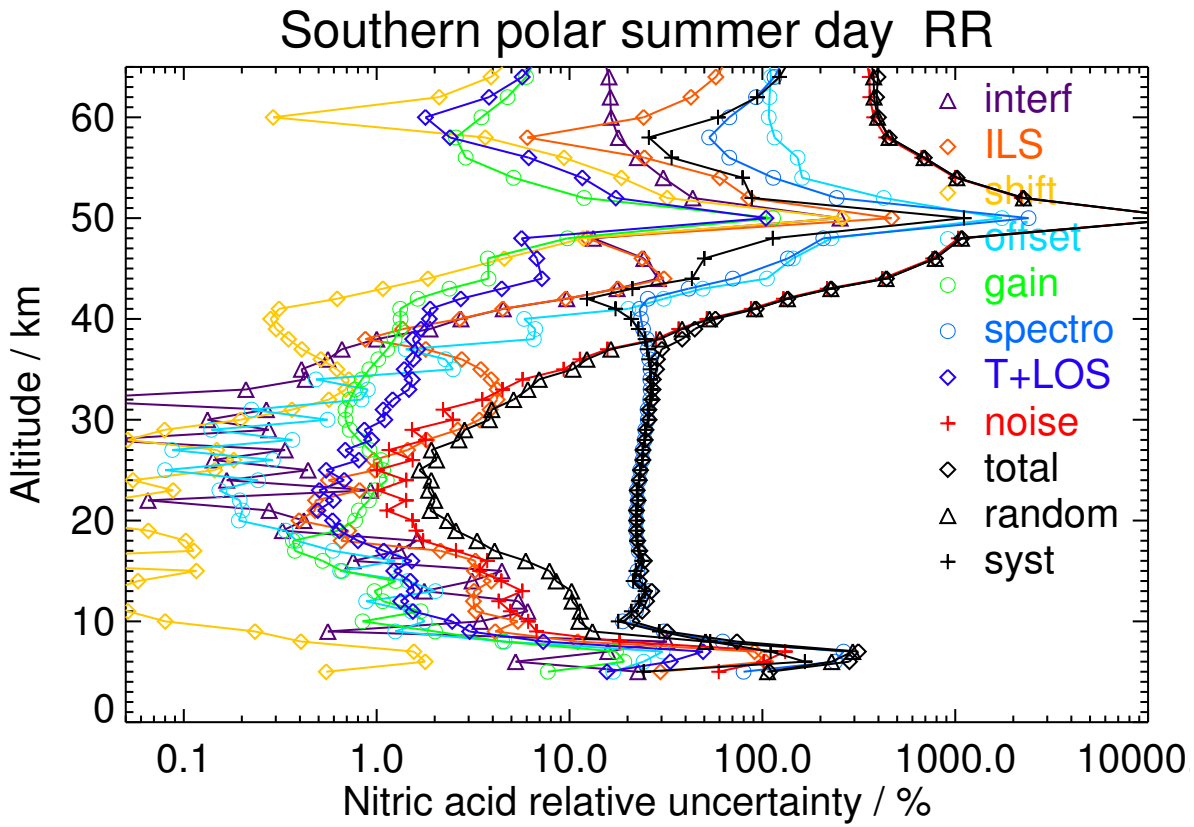


Figure S65: V8R_HNO₃_261 Southern polar summer day

Table S70: HNO₃ error budget for Southern polar summer night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.21	3.66	16.06	1.00	10.84	6.69	71.32	9.99	35.94	75.91	33.92	83.14
8	0.32	5.28	12.05	0.62	5.16	6.28	70.72	7.65	22.07	46.32	60.34	76.07
11	1.47	1.25	3.55	0.12	0.94	1.35	21.35	1.60	4.36	11.30	19.14	22.23
14	1.60	0.70	3.19	0.12	0.80	1.12	24.58	1.49	4.12	11.12	22.63	25.22
17	3.28	0.21	1.49	0.08	0.44	0.30	23.88	1.15	2.27	4.71	23.61	24.07
20	6.76	0.08	0.71	0.07	0.23	0.74	22.38	0.59	1.34	2.85	22.27	22.45
23	8.31	0.13	0.99	0.11	0.13	0.98	22.71	0.52	1.02	1.92	22.71	22.79
26	8.33	0.02	1.12	0.13	0.26	1.01	23.89	0.81	1.48	1.98	23.92	24.00
29	5.99	0.04	3.18	0.20	0.21	0.70	24.86	1.01	1.77	2.34	25.05	25.16
32	3.29	0.02	3.57	0.50	0.80	0.74	26.14	1.20	3.87	4.34	26.37	26.72
35	1.56	0.06	1.61	0.35	2.35	1.08	25.82	1.33	10.01	10.61	25.79	27.89
38	0.57	0.18	0.97	0.25	6.43	1.25	26.06	1.58	30.73	32.00	25.42	40.87
41	0.18	0.87	4.19	0.48	20.98	1.13	26.51	2.07	> 100	> 100	19.01	> 100

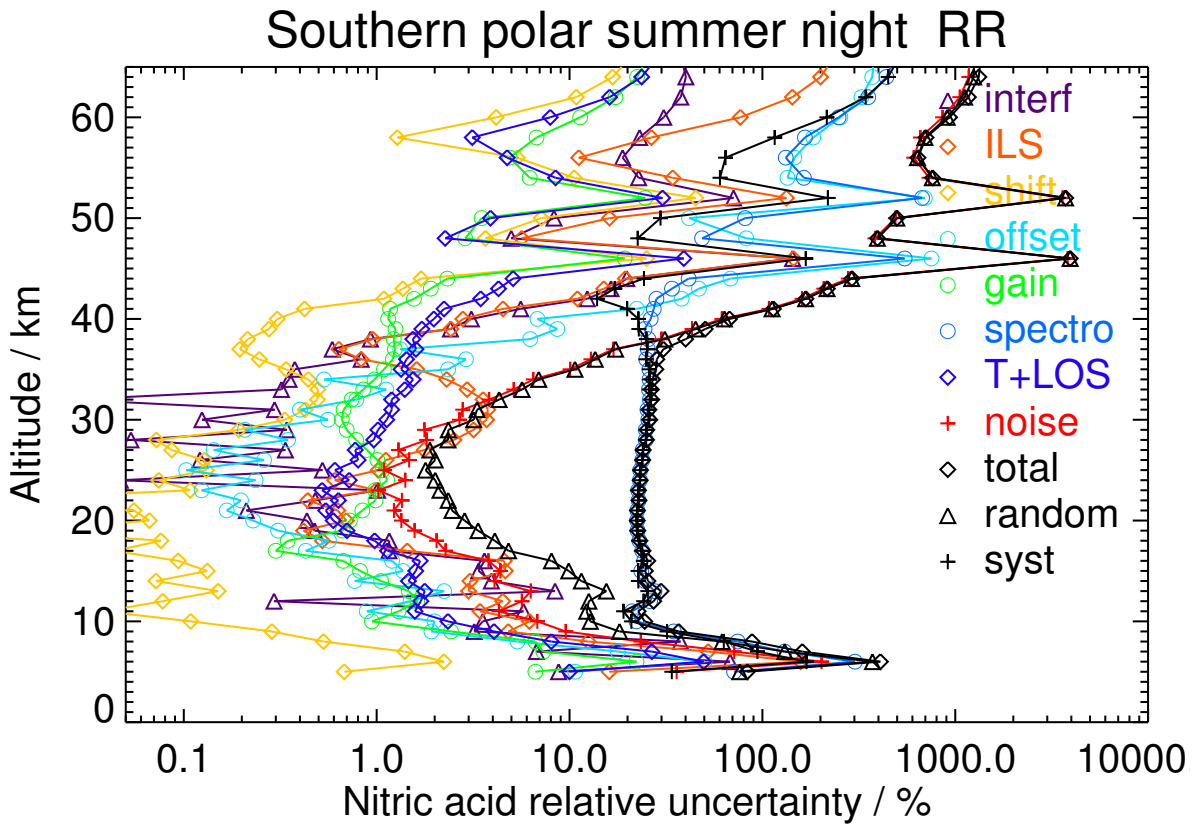


Figure S66: V8R_HNO3_261 Southern polar summer night

Table S71: HNO₃ error budget for Southern polar autumn day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.08	9.10	25.81	1.49	35.15	9.45	84.23	21.39	> 100	> 100	26.52	> 100
8	0.47	2.76	5.75	0.47	5.53	2.49	42.57	5.22	17.74	35.75	30.88	47.24
11	1.08	1.19	4.08	0.19	2.18	1.47	24.21	1.88	7.43	12.49	22.67	25.88
14	1.79	0.53	6.07	0.26	1.32	0.63	26.59	2.07	4.88	12.59	24.82	27.83
17	5.06	0.08	1.12	0.08	0.49	0.36	23.46	1.18	1.97	7.78	22.28	23.60
20	9.24	0.02	0.71	0.09	0.24	0.57	22.91	0.73	1.28	5.28	22.36	22.98
23	12.49	0.05	1.18	0.13	0.11	0.79	22.91	0.62	0.97	2.80	22.82	22.99
26	11.35	0.01	1.59	0.07	0.16	1.10	24.27	0.91	1.34	2.35	24.28	24.40
29	7.29	0.02	2.62	0.27	0.24	1.13	26.10	1.21	1.95	3.36	26.15	26.36
32	3.65	0.02	3.24	0.38	0.76	1.07	27.57	1.62	4.83	6.34	27.53	28.25
35	1.30	0.11	3.87	0.30	2.64	1.03	30.41	2.20	15.96	17.32	30.12	34.75
38	0.34	0.57	3.82	0.54	10.96	0.80	31.10	3.41	67.03	69.46	27.97	74.88
41	0.04	8.10	38.33	8.20	> 100	6.46	> 100	26.98	> 100	> 100	62.32	> 100

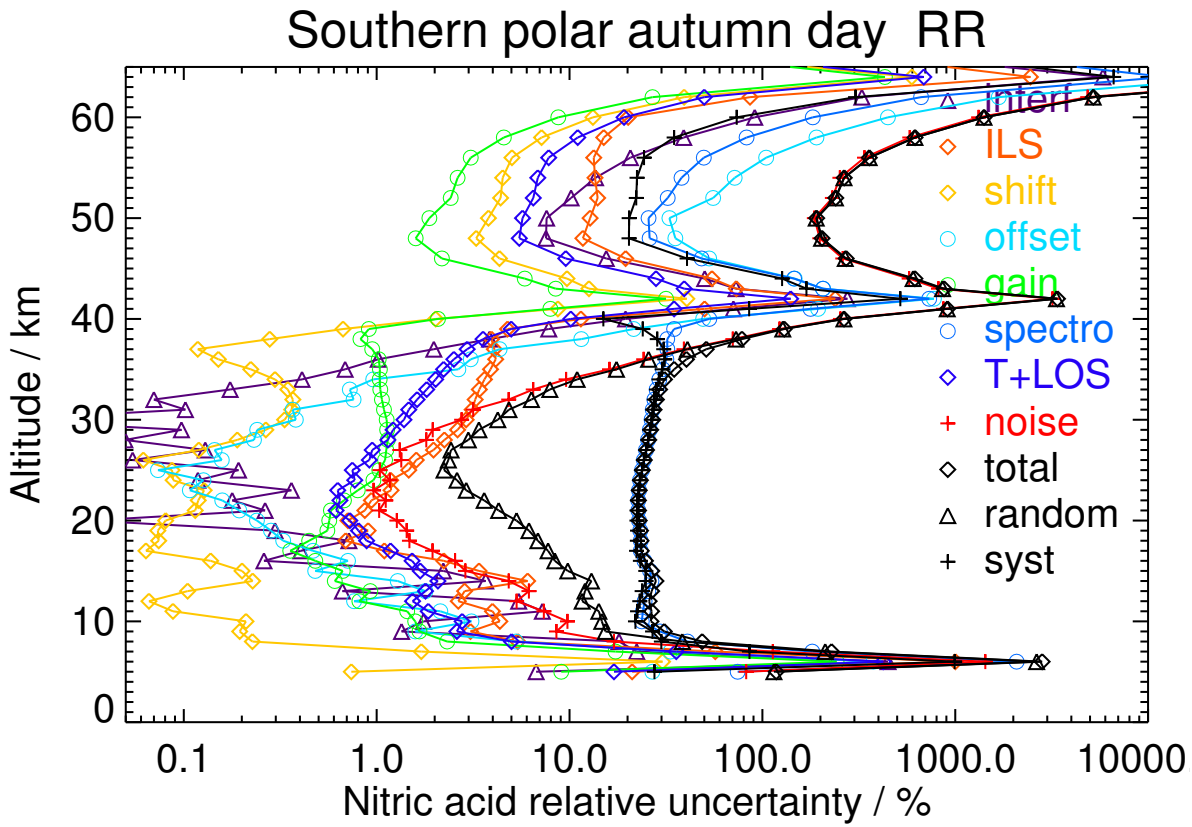


Figure S67: V8R_HNO₃_261 Southern polar autumn day

Table S72: HNO₃ error budget for Southern polar autumn night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
5	0.09	5.68	17.40	1.30	24.42	10.31	60.90	12.43	79.57	> 100	29.81	> 100
8	0.23	5.75	10.64	0.85	12.48	6.46	87.62	10.37	39.26	81.56	54.93	98.34
11	1.07	1.00	3.54	0.15	2.37	1.57	19.50	1.81	7.98	11.99	18.03	21.65
14	1.92	0.40	6.29	0.34	1.19	0.63	24.44	2.37	4.74	10.69	23.51	25.82
17	6.30	0.05	1.32	0.10	0.47	0.41	21.24	1.32	1.67	5.36	20.71	21.40
20	11.18	0.03	0.78	0.10	0.24	0.62	21.42	0.73	1.12	3.17	21.25	21.49
23	13.87	0.05	1.26	0.12	0.10	0.81	22.28	0.68	0.92	2.66	22.20	22.36
26	11.63	0.01	1.80	0.10	0.17	1.12	24.32	1.01	1.34	2.74	24.32	24.47
29	6.83	0.02	2.87	0.32	0.29	1.15	26.62	1.38	2.14	3.30	26.72	26.92
32	3.18	0.02	3.32	0.39	0.84	1.01	27.89	1.72	5.60	6.76	27.92	28.73
35	1.10	0.13	3.76	0.29	2.95	0.98	29.89	2.34	19.08	20.97	29.10	35.87
38	0.23	0.80	4.01	0.89	16.11	1.16	33.20	4.99	> 100	> 100	22.12	> 100
41	-0.02	11.48	76.87	15.76	> 100	7.28	> 100	54.24	> 100	> 100	> 100	> 100

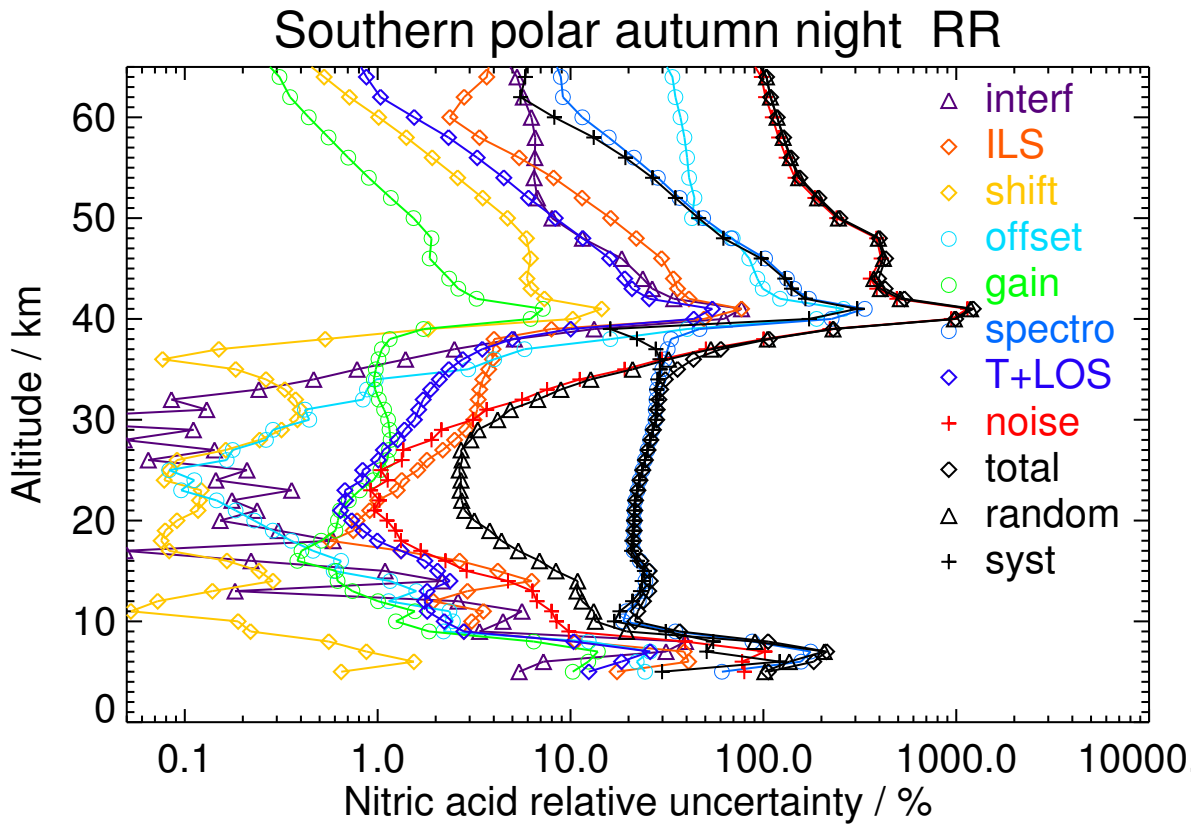


Figure S68: V8R_HNO3_261 Southern polar autumn night

Table S73: HNO₃ error budget for Northern polar winter day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
14	11.99	0.72	0.18	0.08	0.47	1.73	26.49	1.35	1.71	3.16	26.47	26.66
17	7.52	0.17	0.94	0.09	0.48	1.31	22.46	0.74	1.17	7.89	21.15	22.57
20	8.84	0.08	0.94	0.08	0.32	0.94	22.74	0.55	0.89	5.33	22.17	22.81
23	11.13	0.02	0.80	0.09	0.26	0.90	22.39	0.51	0.86	3.26	22.21	22.44
26	10.71	0.01	0.82	0.07	0.23	1.06	23.81	0.59	1.02	3.93	23.55	23.88
29	9.46	0.01	1.19	0.08	0.27	1.09	24.61	0.76	1.34	4.86	24.23	24.71
32	5.33	0.01	1.94	0.23	0.52	1.49	28.07	1.24	2.81	8.61	27.01	28.35
35	1.86	0.03	2.28	0.31	1.57	1.93	33.09	1.87	9.54	15.16	31.17	34.66
38	0.77	0.06	1.42	0.22	4.76	1.41	29.19	1.66	27.09	29.66	27.12	40.19
41	0.38	0.12	1.87	0.40	12.69	0.92	28.59	1.47	66.88	69.63	24.68	73.88
44	0.17	0.48	3.15	0.77	30.41	0.92	39.31	2.17	> 100	> 100	28.43	> 100
46	-0.03	4.29	11.04	7.29	> 100	4.96	> 100	11.77	> 100	> 100	58.34	> 100
50	-0.10	1.65	3.83	3.03	> 100	1.92	36.40	3.23	> 100	> 100	4.29	> 100

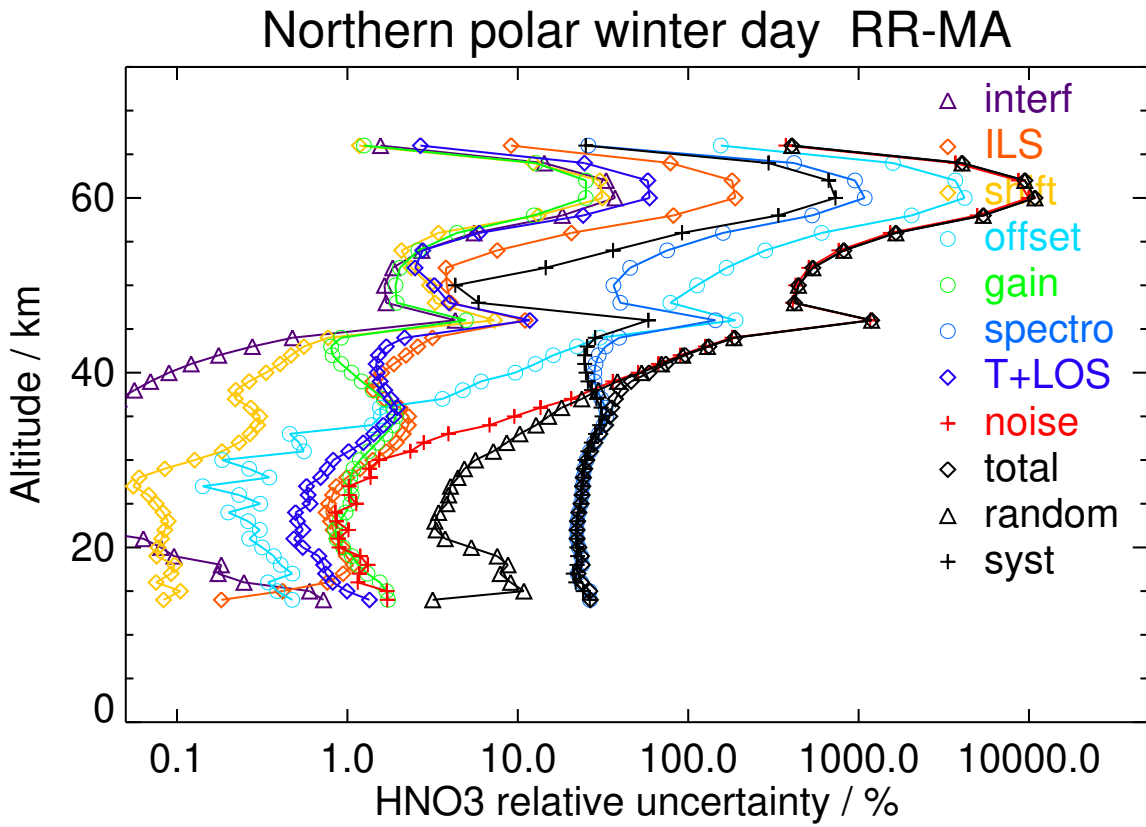


Figure S69: V8R_HNO₃_561 Northern polar winter day

Table S74: HNO₃ error budget for Northern polar winter night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
14	5.19	0.81	0.57	0.27	0.48	1.12	23.36	0.74	2.31	2.78	23.37	23.54
17	9.83	0.16	1.02	0.05	0.48	1.32	22.98	1.18	1.59	8.33	21.58	23.13
20	11.18	0.07	1.19	0.07	0.36	1.00	22.55	0.83	0.98	5.98	21.84	22.64
23	12.33	0.02	1.70	0.07	0.21	0.80	22.91	0.91	1.12	4.37	22.61	23.03
26	9.26	0.01	2.45	0.17	0.31	1.03	25.27	1.31	1.58	5.58	24.87	25.49
29	5.59	0.02	2.30	0.16	0.49	1.26	29.50	1.38	2.81	13.75	26.42	29.79
32	3.14	0.02	2.08	0.18	0.85	1.65	31.51	1.24	5.65	17.81	26.78	32.16
35	1.90	0.04	1.60	0.15	1.52	1.29	27.07	1.14	10.62	15.00	25.07	29.22
38	0.93	0.07	2.22	0.22	4.38	0.88	29.37	1.46	24.14	26.94	27.32	38.37
41	0.29	0.26	4.06	0.77	20.21	0.89	47.70	2.76	90.05	96.19	39.57	> 100
44	0.05	1.89	16.49	4.45	> 100	2.67	> 100	11.10	> 100	> 100	> 100	> 100
46	-0.03	3.71	21.42	8.12	> 100	6.64	> 100	11.67	> 100	> 100	> 100	> 100
50	-0.02	8.60	22.47	19.39	> 100	15.95	> 100	18.08	> 100	> 100	> 100	> 100

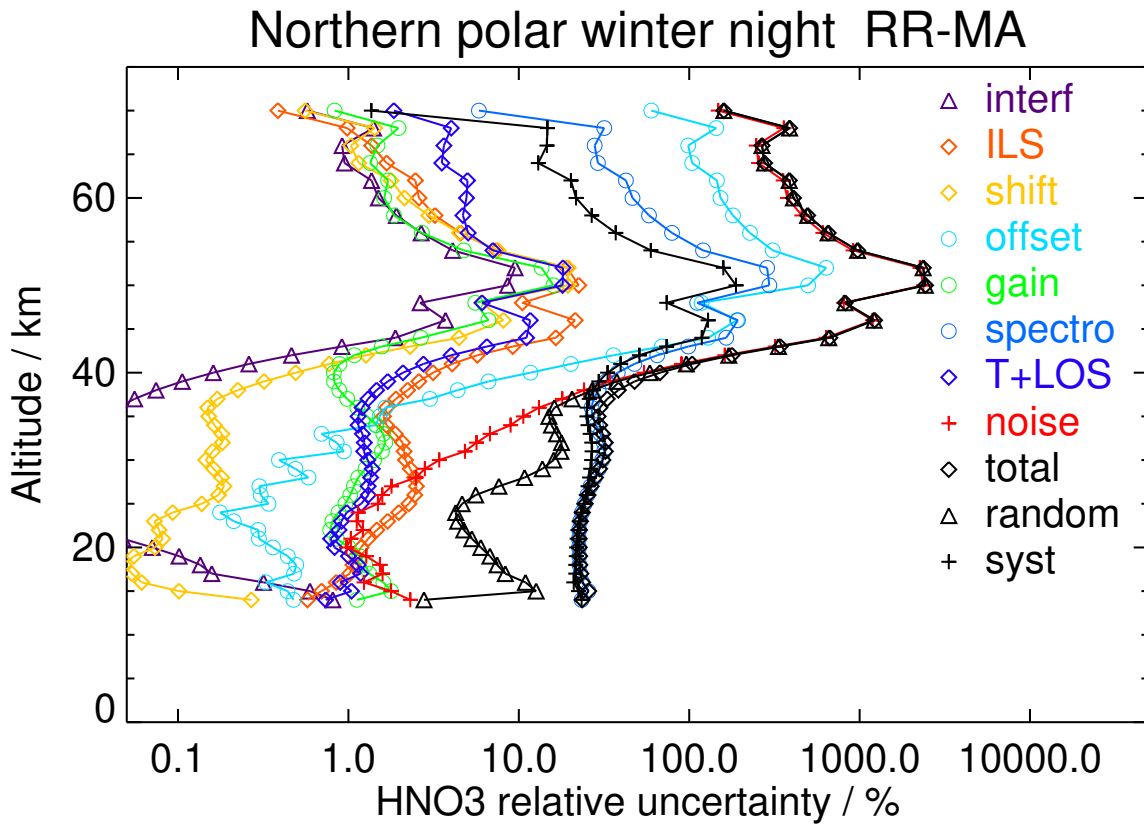


Figure S70: V8R_HNO₃_561 Northern polar winter night

Table S75: HNO₃ error budget for Northern polar spring day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	8.20	0.24	0.82	0.06	0.35	1.06	23.13	0.82	1.82	3.41	23.00	23.26
20	9.21	0.02	1.04	0.06	0.29	1.02	21.21	0.52	0.86	1.57	21.23	21.29
23	9.68	0.02	1.12	0.09	0.16	0.93	22.89	0.68	0.99	1.43	22.92	22.97
26	7.84	0.01	1.67	0.04	0.18	1.13	24.31	0.87	1.40	2.33	24.33	24.45
29	5.40	0.01	2.53	0.26	0.29	1.03	25.57	1.13	2.32	4.23	25.50	25.85
32	2.63	0.02	3.30	0.45	0.66	1.09	28.06	1.61	5.58	8.75	27.51	28.87
35	0.91	0.05	3.51	0.38	2.09	1.10	30.47	2.02	18.40	20.59	29.41	35.90
38	0.27	0.20	2.23	0.23	9.16	1.07	29.47	2.26	68.34	70.13	26.75	75.06
41	0.06	1.50	4.90	1.32	83.15	2.60	59.96	5.12	> 100	> 100	23.02	> 100
44	-0.03	2.47	10.94	3.07	> 100	3.17	86.06	7.06	> 100	> 100	19.71	> 100
46	-0.02	4.34	12.07	9.64	> 100	7.38	> 100	7.20	> 100	> 100	> 100	> 100
50	-0.03	3.31	5.32	8.15	90.21	5.48	> 100	4.30	> 100	> 100	86.56	> 100

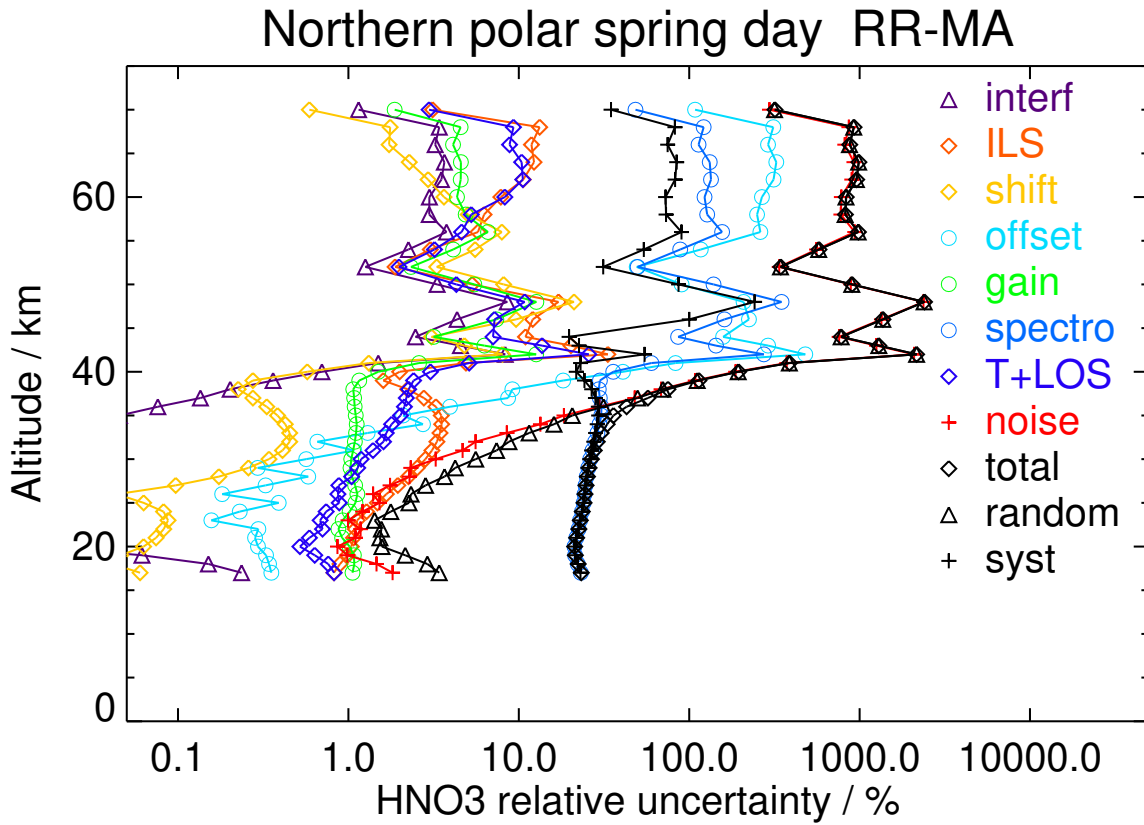


Figure S71: V8R_HNO3_561 Northern polar spring day

Table S76: HNO₃ error budget for Northern polar spring night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	7.44	0.26	0.71	0.06	0.38	1.04	23.53	0.83	1.93	4.31	23.26	23.66
20	8.81	0.02	0.99	0.07	0.30	0.97	21.66	0.51	0.86	2.61	21.57	21.73
23	9.64	0.02	1.13	0.09	0.17	0.92	23.11	0.67	0.98	1.79	23.12	23.19
26	7.66	0.01	1.79	0.06	0.19	1.17	24.66	0.92	1.41	2.32	24.71	24.82
29	4.98	0.01	2.68	0.28	0.32	1.06	25.92	1.19	2.47	3.82	25.95	26.23
32	2.43	0.02	3.31	0.47	0.71	1.08	27.63	1.57	5.81	7.54	27.49	28.50
35	0.88	0.05	3.20	0.44	2.11	1.10	29.28	1.90	18.52	20.06	28.60	34.93
38	0.27	0.18	1.75	0.27	9.01	1.21	31.58	2.14	68.32	70.84	27.15	75.87
41	0.04	2.16	7.60	1.34	> 100	4.65	> 100	7.67	> 100	> 100	49.65	> 100
44	-0.06	1.29	5.57	1.31	85.53	1.51	57.05	3.73	> 100	> 100	15.19	> 100
46	-0.07	1.32	3.50	2.99	74.20	2.36	53.22	2.10	> 100	> 100	25.34	> 100
50	0.01	15.91	22.94	44.01	> 100	23.01	> 100	22.38	> 100	> 100	> 100	> 100

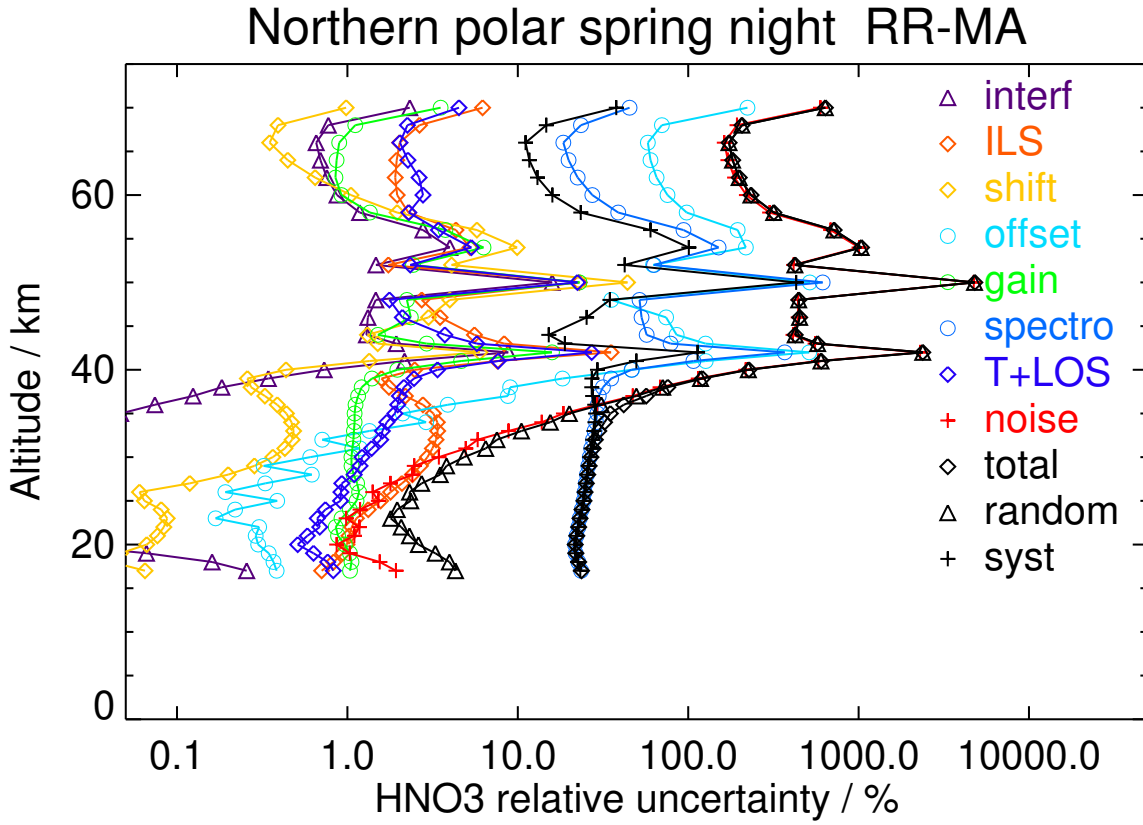


Figure S72: V8R_HNO₃_561 Northern polar spring night

Table S77: HNO3 error budget for Northern polar summer day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	4.11	0.55	0.41	0.15	0.52	0.79	25.01	0.75	2.67	4.07	24.86	25.20
20	6.10	0.08	0.72	0.09	0.30	0.72	21.19	0.48	0.98	1.40	21.20	21.25
23	8.27	0.05	0.53	0.06	0.19	0.97	22.65	0.43	0.85	1.14	22.67	22.69
26	7.58	0.02	1.04	0.11	0.19	1.24	23.67	0.62	1.05	1.46	23.72	23.76
29	6.00	< 0.01	2.09	0.08	0.23	0.92	24.69	0.77	1.48	2.14	24.76	24.85
32	3.53	0.01	3.48	0.41	0.43	0.91	25.91	1.14	2.87	3.48	26.11	26.34
35	1.53	0.02	2.75	0.57	1.14	0.99	26.69	1.56	7.86	8.41	26.76	28.05
38	0.54	0.08	0.32	0.25	3.73	1.33	26.87	1.83	26.74	27.70	26.25	38.16
41	0.17	0.40	1.05	0.44	20.40	1.11	28.50	1.71	92.13	95.54	24.38	98.60
44	0.05	1.51	3.03	0.71	89.92	1.89	68.53	2.73	> 100	> 100	39.24	> 100
46	-0.04	2.25	4.85	4.55	> 100	4.87	76.50	3.02	> 100	> 100	50.08	> 100
50	-0.03	3.88	5.37	7.86	> 100	5.32	> 100	2.87	> 100	> 100	72.58	> 100

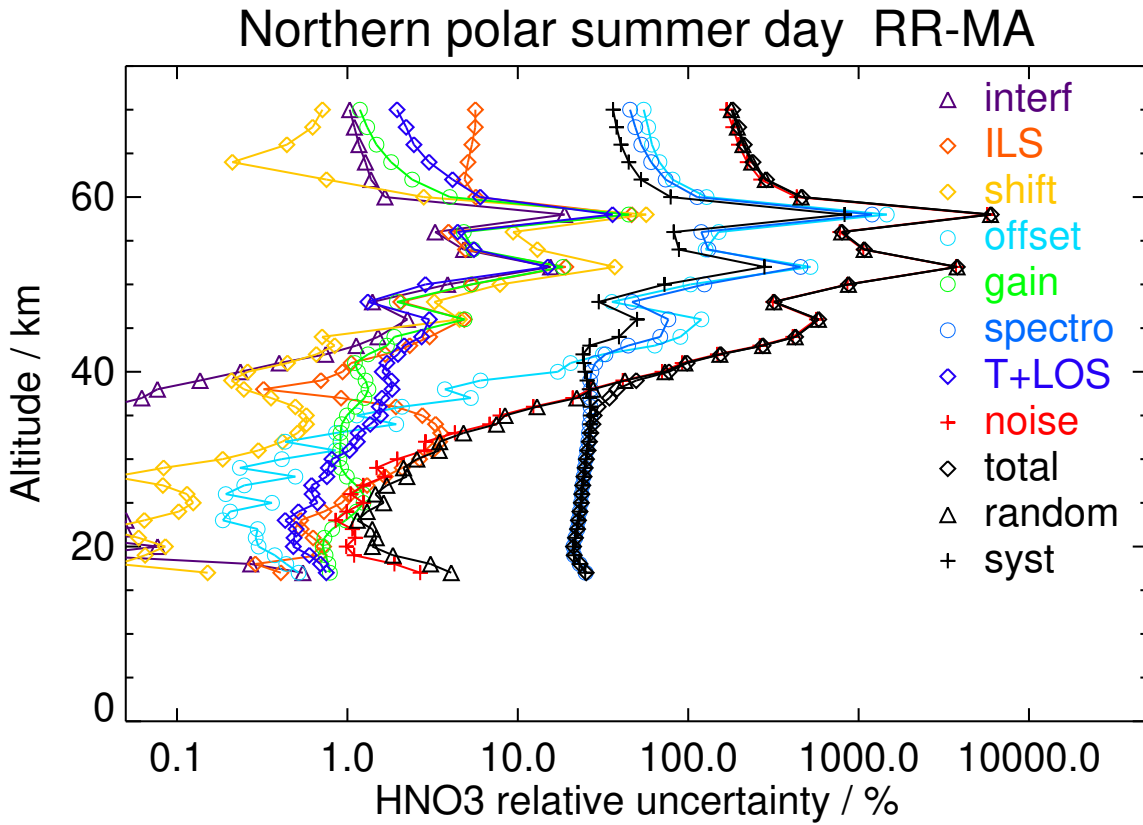


Figure S73: V8R_HNO3_561 Northern polar summer day

Table S78: HNO₃ error budget for Northern polar summer night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	4.68	0.40	0.46	0.14	0.53	0.83	23.97	0.85	2.46	5.25	23.56	24.14
20	6.99	0.03	0.73	0.08	0.31	0.77	21.10	0.48	0.89	1.99	21.06	21.15
23	9.22	0.03	0.67	0.08	0.20	0.92	22.46	0.47	0.86	1.70	22.44	22.51
26	8.26	0.01	1.20	0.08	0.20	1.20	23.81	0.68	1.11	1.77	23.84	23.91
29	6.01	< 0.01	2.21	0.16	0.28	0.98	25.03	0.89	1.68	2.55	25.09	25.22
32	3.29	0.01	3.27	0.46	0.56	1.02	26.30	1.26	3.53	4.23	26.46	26.80
35	1.36	0.03	2.97	0.54	1.47	1.11	27.20	1.62	10.17	10.73	27.26	29.29
38	0.40	0.10	0.82	0.34	5.71	1.46	29.54	2.16	41.22	42.49	28.41	51.11
41	0.11	0.59	1.67	0.35	33.81	1.71	36.25	2.09	> 100	> 100	23.75	> 100
44	0.05	1.48	5.12	0.75	97.20	2.44	75.63	3.40	> 100	> 100	36.80	> 100
46	0.02	4.31	11.40	8.01	> 100	10.75	> 100	7.01	> 100	> 100	> 100	> 100
50	-0.09	1.18	2.28	2.60	36.17	1.92	41.26	1.47	> 100	> 100	24.18	> 100

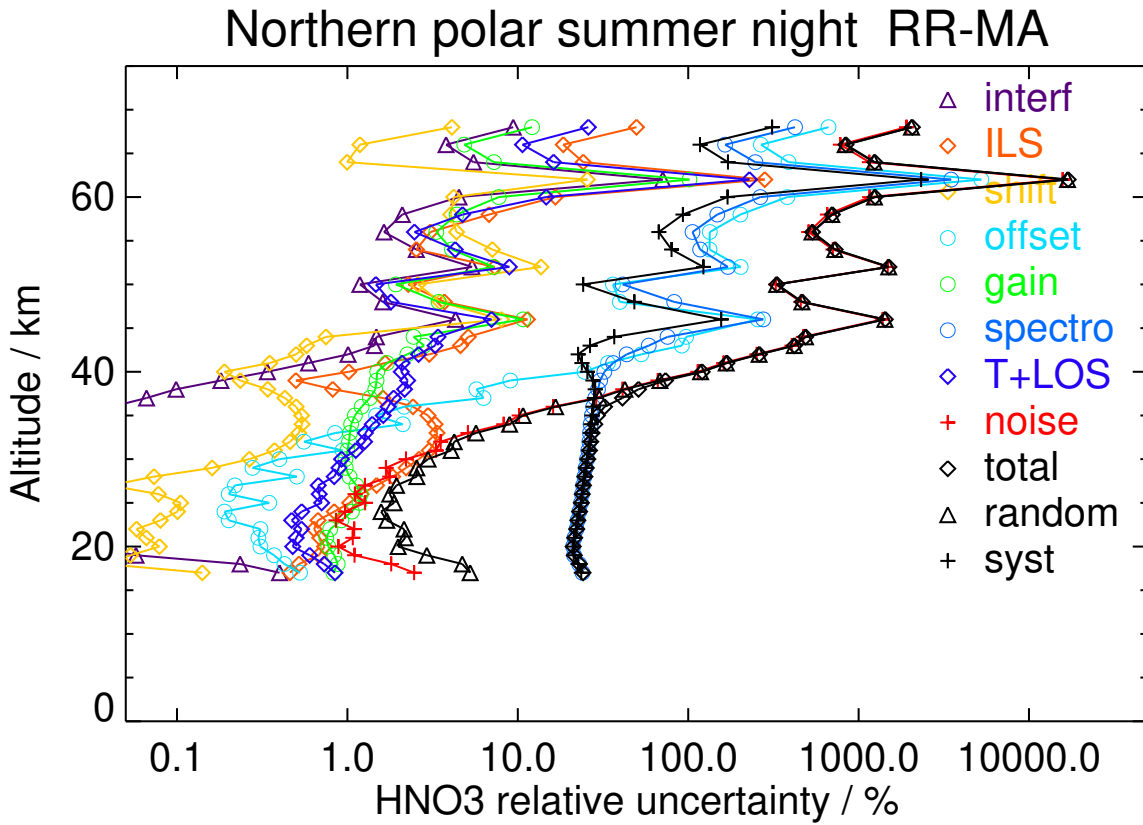


Figure S74: V8R_HNO₃_561 Northern polar summer night

Table S79: HNO₃ error budget for Northern polar autumn day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	7.52	0.23	0.62	0.07	0.43	1.05	22.75	0.88	2.00	5.70	22.17	22.89
20	9.42	0.03	0.88	0.07	0.31	0.90	20.79	0.54	0.82	3.16	20.61	20.85
23	11.47	0.02	0.95	0.09	0.20	0.82	22.02	0.61	0.93	2.07	21.99	22.09
26	10.03	< 0.01	1.42	0.05	0.19	1.13	23.62	0.86	1.22	2.52	23.60	23.74
29	6.45	0.01	2.20	0.22	0.31	1.19	25.75	1.21	2.08	4.02	25.67	25.99
32	3.08	0.02	2.89	0.37	0.70	1.23	27.61	1.62	5.00	6.84	27.45	28.29
35	1.05	0.05	3.47	0.36	2.13	1.31	30.23	2.03	17.03	18.67	29.63	35.02
38	0.30	0.17	2.62	0.22	9.80	1.32	32.13	2.41	67.50	70.09	28.05	75.49
41	0.13	0.49	2.07	0.47	38.97	1.47	38.16	2.63	> 100	> 100	18.42	> 100
44	0.09	0.68	3.29	0.92	61.31	1.18	52.22	3.13	> 100	> 100	21.67	> 100
46	-0.03	2.81	12.20	5.93	> 100	6.01	> 100	8.36	> 100	> 100	98.63	> 100
50	-0.24	0.40	0.75	1.29	18.75	0.67	14.45	0.83	> 100	> 100	8.21	> 100

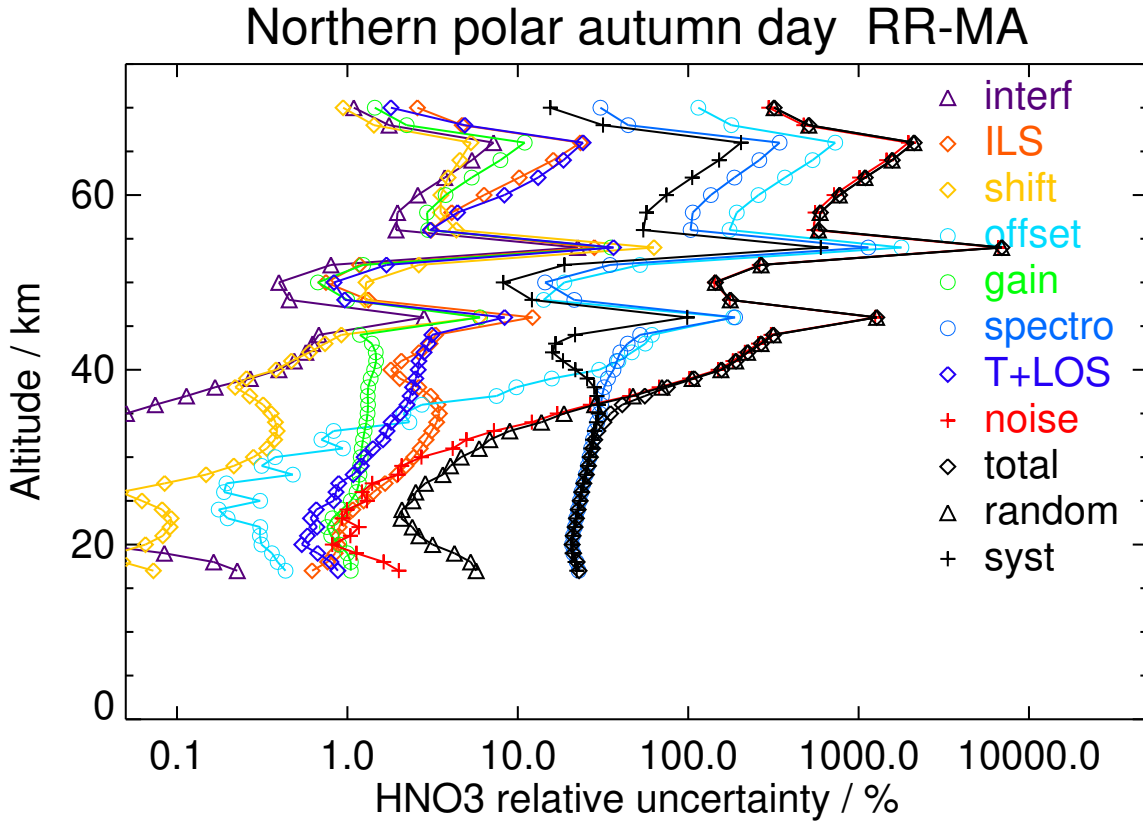


Figure S75: V8R_HNO₃_561 Northern polar autumn day

Table S80: HNO₃ error budget for Northern polar autumn night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	7.72	0.22	0.55	0.07	0.46	1.00	23.15	0.94	2.02	5.22	22.70	23.29
20	10.09	0.04	0.89	0.07	0.32	0.82	21.61	0.55	0.80	2.39	21.53	21.66
23	12.31	0.02	1.01	0.10	0.21	0.79	22.55	0.63	0.95	1.62	22.56	22.62
26	10.47	< 0.01	1.56	0.05	0.20	1.19	24.28	0.95	1.26	1.93	24.34	24.41
29	6.43	0.01	2.36	0.23	0.38	1.25	26.31	1.33	2.22	3.14	26.39	26.58
32	3.01	0.02	2.91	0.34	0.83	1.25	27.97	1.70	5.42	6.43	28.00	28.73
35	1.01	0.05	3.57	0.26	2.52	1.30	31.19	2.16	18.66	19.94	30.81	36.70
38	0.27	0.16	3.41	0.21	11.81	1.20	34.82	2.74	77.79	80.44	30.87	86.16
41	0.09	0.66	2.76	0.69	59.44	1.54	40.94	4.07	> 100	> 100	19.67	> 100
44	0.09	0.75	3.41	1.09	65.41	1.09	37.10	3.94	> 100	> 100	11.98	> 100
46	0.08	1.00	3.26	2.39	66.49	1.77	59.46	3.67	> 100	> 100	31.09	> 100
50	-0.06	1.72	3.04	5.95	81.19	3.89	94.77	4.24	> 100	> 100	47.90	> 100

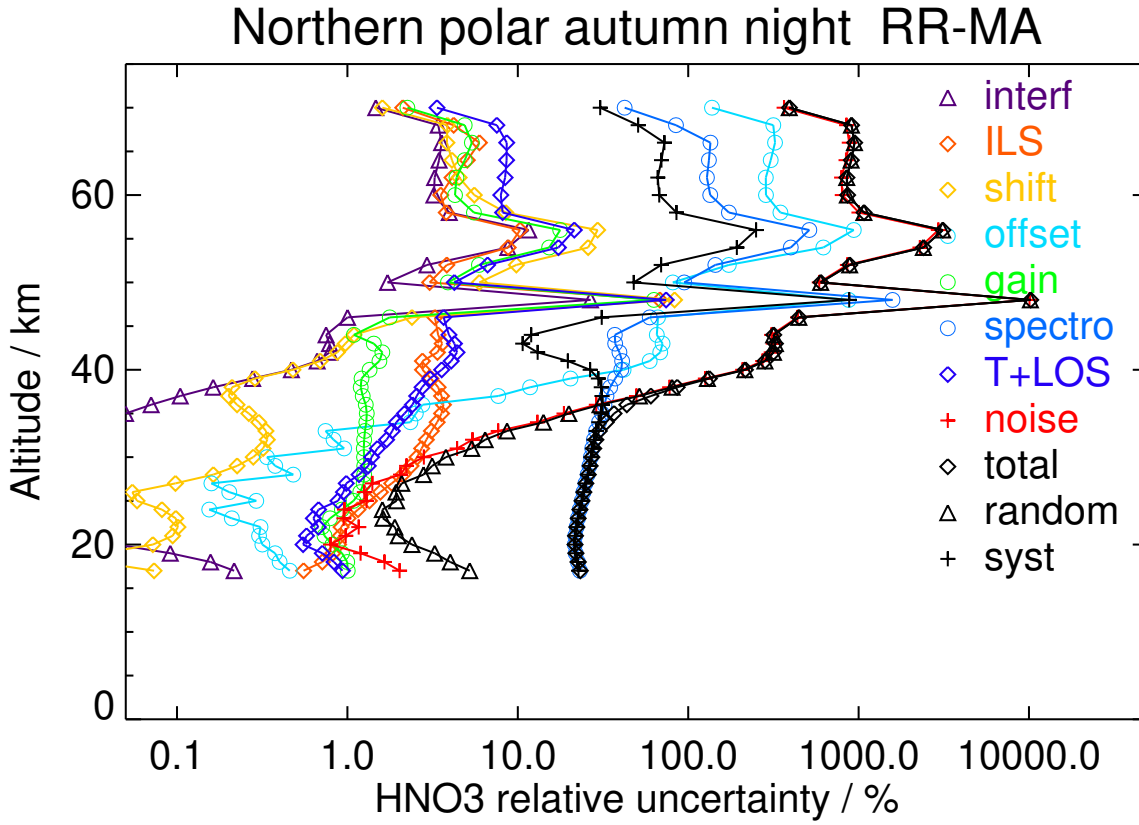


Figure S76: V8R_HNO3_561 Northern polar autumn night

Table S81: HNO₃ error budget for Northern midlatitude winter day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
14	4.31	0.85	0.84	0.30	0.61	0.73	24.31	0.94	2.95	3.28	24.34	24.56
17	4.21	0.18	0.99	0.12	0.49	0.80	23.34	0.77	1.53	7.13	22.33	23.44
20	7.41	0.09	0.57	0.10	0.36	0.58	22.74	0.58	1.14	4.63	22.32	22.80
23	9.51	0.02	0.79	0.10	0.31	1.05	22.59	0.60	1.09	2.73	22.50	22.66
26	8.81	0.01	1.20	0.06	0.29	1.05	24.03	0.72	1.29	4.38	23.73	24.13
29	6.80	0.02	1.94	0.15	0.38	1.04	25.18	0.93	1.82	5.81	24.69	25.36
32	3.23	0.03	2.80	0.40	0.86	1.31	28.10	1.45	4.31	8.05	27.49	28.65
35	1.08	0.08	1.59	0.26	2.64	1.56	29.11	1.88	15.06	16.67	28.50	33.01
38	0.34	0.25	0.92	0.16	11.04	1.32	26.87	1.87	54.16	56.29	24.79	61.51
41	0.07	1.18	2.73	0.73	60.68	1.63	54.07	3.48	> 100	> 100	28.02	> 100
44	-0.01	7.85	23.26	12.80	> 100	11.51	> 100	16.01	> 100	> 100	> 100	> 100
46	0.03	2.59	5.94	6.06	> 100	5.06	> 100	4.97	> 100	> 100	99.65	> 100
50	0.09	1.23	2.56	3.36	54.99	2.44	67.05	2.17	> 100	> 100	43.59	> 100

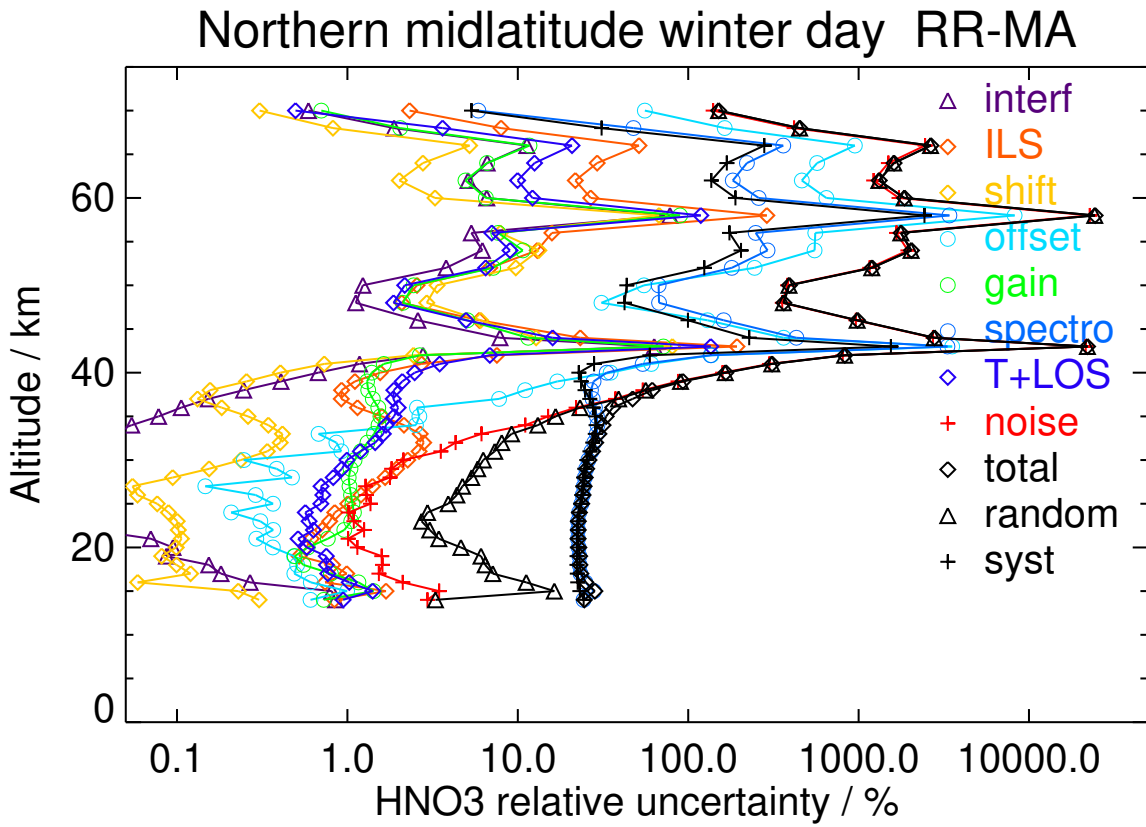


Figure S77: V8R_HNO₃_561 Northern midlatitude winter day

Table S82: HNO₃ error budget for Northern midlatitude winter night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	5.83	0.17	0.77	0.08	0.49	1.09	22.26	0.82	1.55	7.98	20.90	22.37
20	8.11	0.05	0.68	0.09	0.38	0.74	21.67	0.64	1.20	3.75	21.41	21.74
23	10.30	0.02	0.70	0.11	0.31	0.89	22.43	0.59	1.08	3.05	22.29	22.50
26	10.00	< 0.01	1.28	0.06	0.30	1.04	24.04	0.70	1.23	4.00	23.81	24.14
29	7.36	0.01	2.33	0.21	0.45	1.13	25.57	0.98	1.85	4.71	25.35	25.79
32	3.24	0.03	3.46	0.46	1.11	1.42	28.96	1.58	4.77	7.58	28.67	29.66
35	1.10	0.06	2.35	0.32	3.11	1.53	29.87	1.84	15.90	18.27	28.85	34.15
38	0.45	0.13	0.98	0.19	8.02	1.14	26.40	1.51	42.14	43.92	24.76	50.42
41	0.18	0.43	1.36	0.33	27.00	1.01	30.32	1.73	> 100	> 100	23.43	> 100
44	0.05	1.32	4.72	1.99	84.68	1.92	74.43	3.41	> 100	> 100	49.63	> 100
46	-0.01	10.64	26.89	25.32	> 100	20.11	> 100	18.98	> 100	> 100	> 100	> 100
50	0.01	12.67	26.84	36.67	> 100	24.67	> 100	24.70	> 100	> 100	> 100	> 100

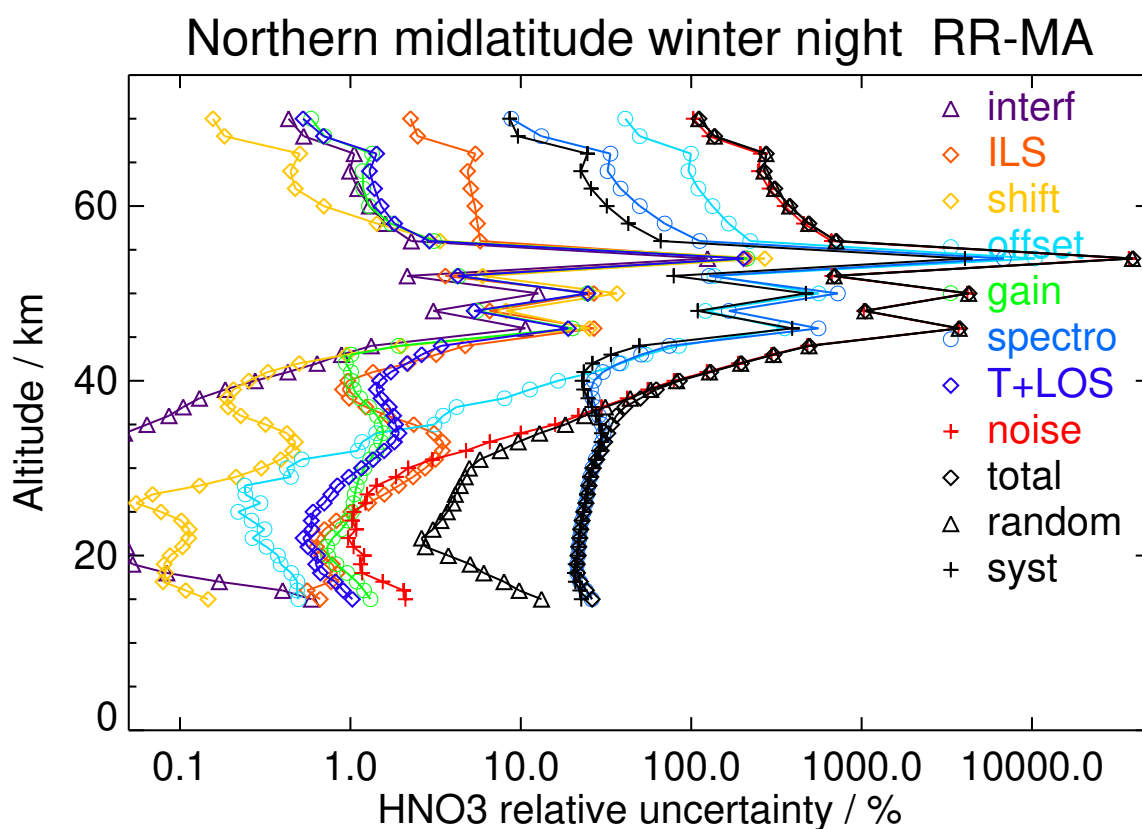


Figure S78: V8R_HNO₃_561 Northern midlatitude winter night

Table S83: HNO₃ error budget for Northern midlatitude spring day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	4.59	0.33	0.80	0.11	0.63	1.01	24.97	1.06	2.80	8.89	23.57	25.19
20	6.51	0.03	0.76	0.08	0.32	0.85	21.83	0.57	1.05	3.78	21.57	21.90
23	8.44	0.02	0.88	0.09	0.20	0.90	22.49	0.57	1.01	2.24	22.45	22.56
26	7.10	0.02	1.65	0.04	0.18	1.12	24.04	0.83	1.35	2.11	24.08	24.17
29	4.97	0.02	2.55	0.24	0.24	0.93	25.03	1.00	2.13	3.02	25.11	25.29
32	2.56	0.03	3.42	0.50	0.47	1.04	26.68	1.38	4.73	6.00	26.71	27.37
35	1.02	0.07	2.77	0.49	1.26	1.12	27.71	1.67	13.97	15.12	27.34	31.25
38	0.39	0.15	0.75	0.24	4.60	1.22	27.83	1.62	42.05	43.53	25.95	50.68
41	0.17	0.46	1.07	0.32	23.15	1.15	31.46	1.51	> 100	> 100	23.87	> 100
44	0.04	1.63	4.26	0.98	> 100	2.07	92.03	3.83	> 100	> 100	56.41	> 100
46	-0.04	2.14	5.40	4.62	> 100	3.87	> 100	3.01	> 100	> 100	61.76	> 100
50	-0.11	0.87	1.73	2.49	23.22	1.21	37.16	1.06	> 100	> 100	23.42	> 100

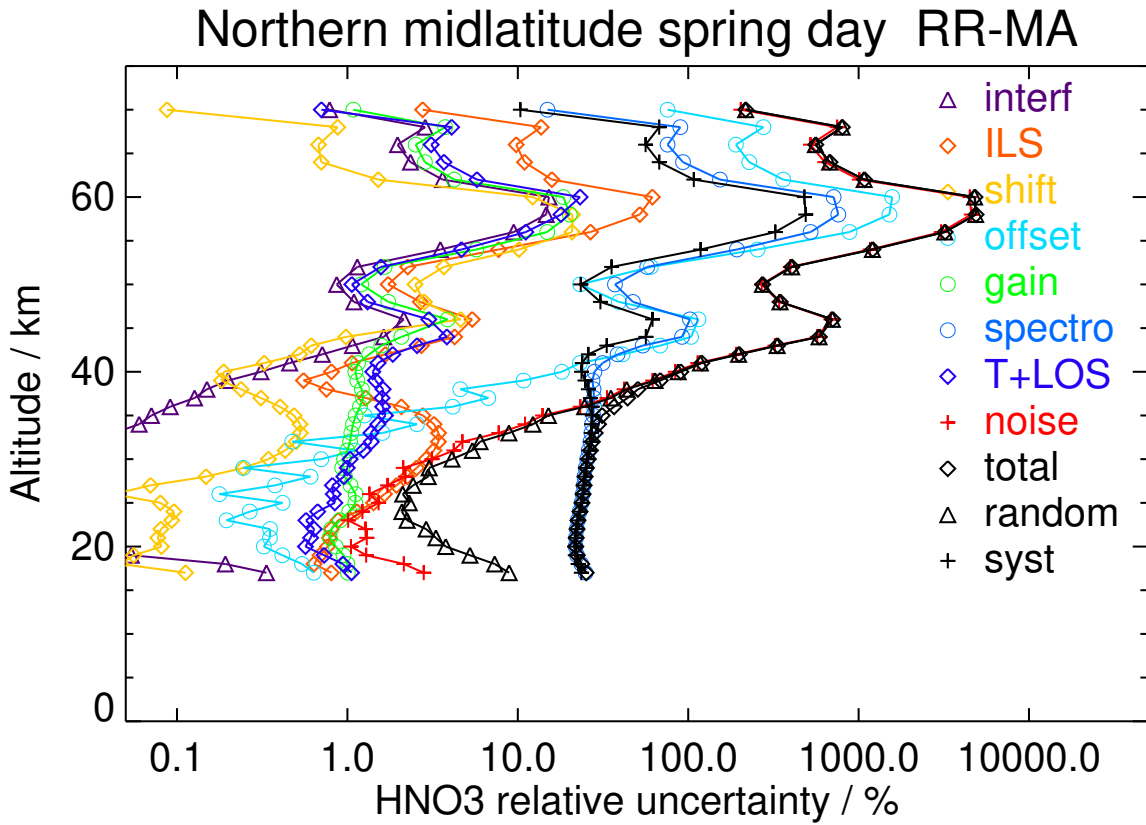


Figure S79: V8R_HNO₃_561 Northern midlatitude spring day

Table S84: HNO₃ error budget for Northern midlatitude spring night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	4.51	0.34	0.77	0.11	0.63	0.99	24.91	1.03	2.75	8.95	23.48	25.13
20	6.42	0.03	0.77	0.08	0.32	0.82	22.16	0.55	1.02	3.88	21.89	22.23
23	8.43	0.02	0.90	0.09	0.20	0.87	22.97	0.56	1.01	2.21	22.92	23.03
26	7.06	0.01	1.70	0.04	0.20	1.15	24.63	0.86	1.42	2.36	24.66	24.78
29	4.90	0.02	2.52	0.24	0.31	0.97	25.49	1.05	2.29	3.26	25.55	25.76
32	2.58	0.03	3.36	0.48	0.64	1.00	26.80	1.42	5.03	5.82	26.92	27.54
35	0.97	0.08	2.99	0.52	1.81	1.08	28.48	1.78	15.37	16.66	28.05	32.63
38	0.36	0.17	0.96	0.24	5.98	1.22	29.67	1.63	47.62	49.85	26.52	56.47
41	0.18	0.42	0.95	0.27	22.83	1.19	34.41	1.37	> 100	> 100	24.71	> 100
44	0.05	1.55	4.63	0.93	99.37	1.79	95.91	3.99	> 100	> 100	55.51	> 100
46	-0.12	0.69	2.03	1.44	39.65	1.47	28.11	1.22	> 100	> 100	16.42	> 100
50	-0.05	2.13	3.68	5.95	68.32	3.23	90.80	2.55	> 100	> 100	54.71	> 100

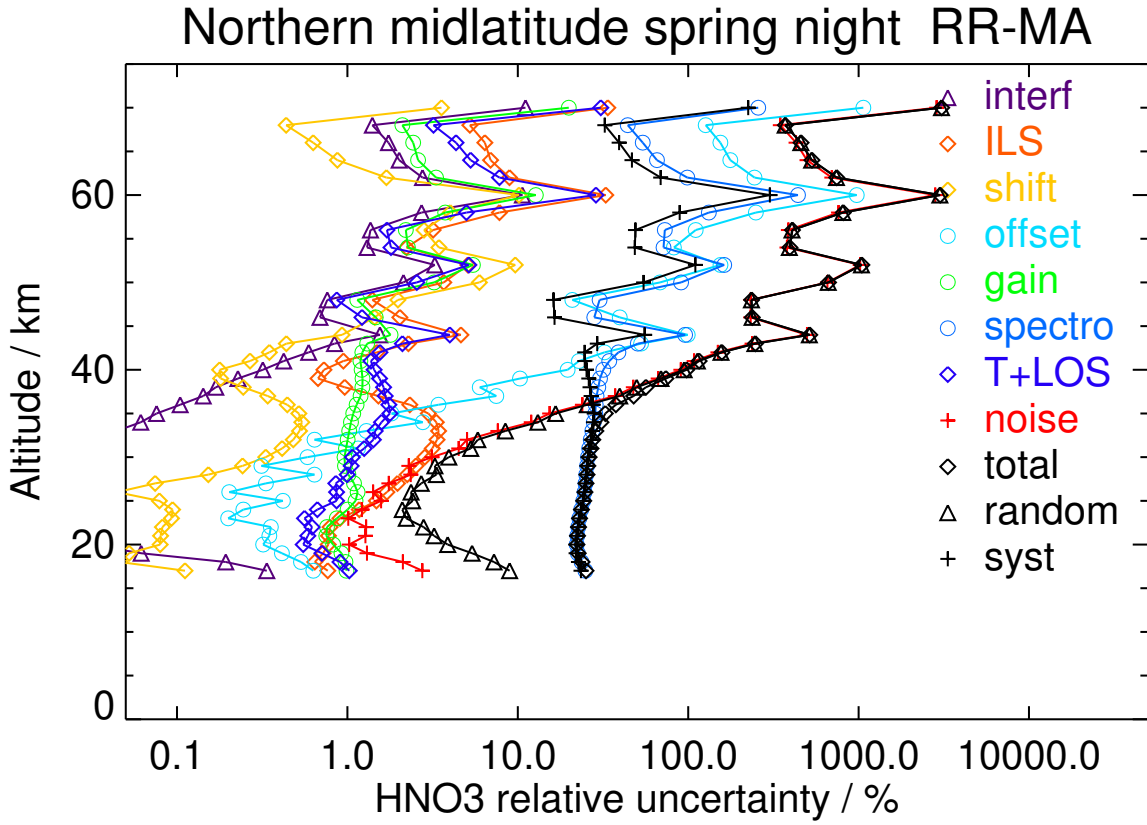


Figure S80: V8R_HNO₃_561 Northern midlatitude spring night

Table S85: HNO₃ error budget for Northern midlatitude summer day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	3.25	0.50	1.35	0.21	0.82	0.72	25.69	1.27	3.47	8.41	24.62	26.02
20	5.68	0.05	0.66	0.10	0.32	0.57	22.40	0.60	1.05	2.64	22.30	22.45
23	8.43	0.03	0.63	0.08	0.20	0.92	22.70	0.47	0.90	1.69	22.69	22.76
26	7.26	0.01	1.38	0.09	0.18	1.23	24.15	0.76	1.19	1.81	24.20	24.27
29	5.34	0.01	2.28	0.15	0.23	0.93	24.94	0.87	1.75	2.39	25.02	25.14
32	3.06	0.03	3.34	0.42	0.42	1.02	26.07	1.19	3.49	4.00	26.27	26.57
35	1.37	0.05	2.63	0.48	1.03	1.10	26.79	1.49	9.30	9.82	26.82	28.56
38	0.57	0.10	0.48	0.21	3.06	1.24	26.18	1.55	26.50	27.38	25.53	37.43
41	0.14	0.54	1.18	0.45	25.52	1.44	38.67	2.41	> 100	> 100	31.20	> 100
44	-0.04	1.77	3.91	0.65	> 100	1.88	66.68	3.31	> 100	> 100	30.88	> 100
46	0.00	29.82	59.76	62.43	> 100	54.04	> 100	35.80	> 100	> 100	> 100	> 100
50	0.02	3.99	7.30	9.36	89.26	6.38	> 100	3.98	> 100	> 100	> 100	> 100

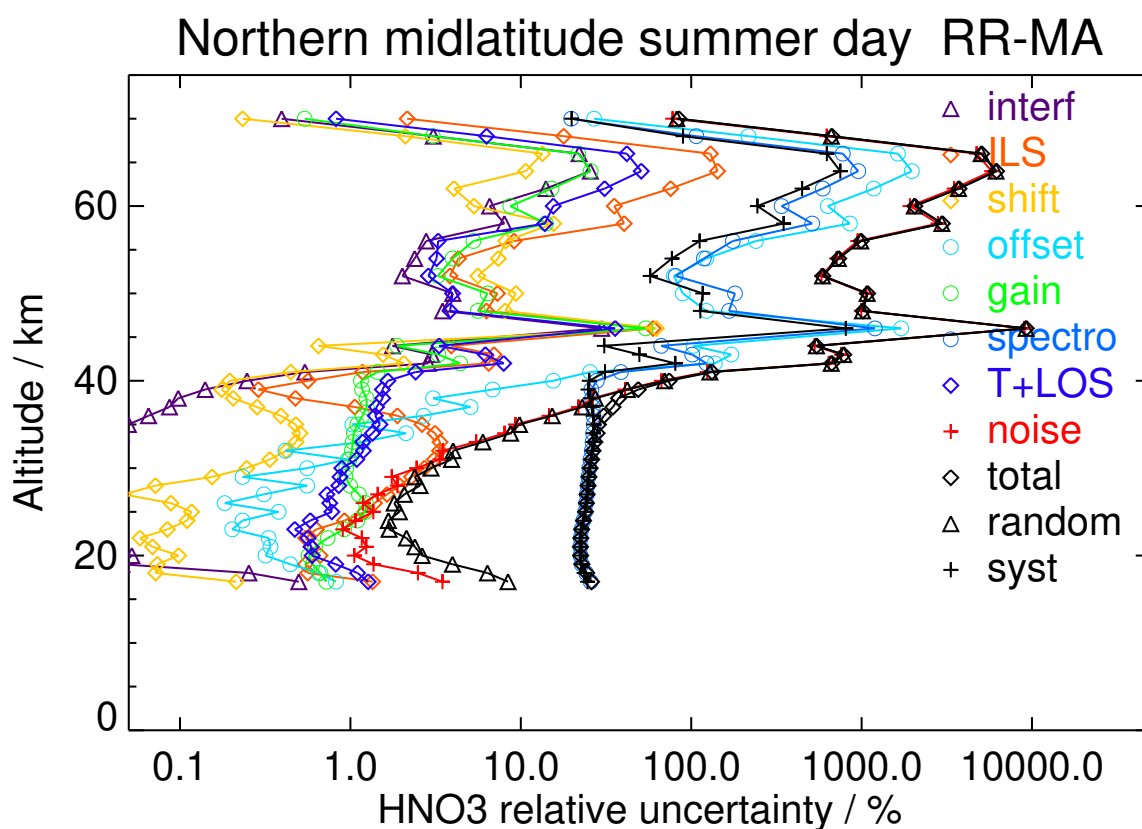


Figure S81: V8R_HNO₃_561 Northern midlatitude summer day

Table S86: HNO₃ error budget for Northern midlatitude summer night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	3.38	0.50	1.18	0.19	0.74	0.83	24.74	1.14	3.27	7.97	23.74	25.04
20	5.62	0.05	0.65	0.09	0.32	0.69	21.41	0.58	1.05	2.54	21.32	21.47
23	8.20	0.03	0.63	0.08	0.21	0.92	22.32	0.47	0.91	1.71	22.31	22.37
26	7.17	0.02	1.35	0.10	0.20	1.17	23.86	0.74	1.17	1.70	23.91	23.97
29	5.23	0.01	2.25	0.14	0.26	0.85	24.80	0.87	1.76	2.24	24.90	25.00
32	3.06	0.03	3.26	0.41	0.46	0.88	25.85	1.16	3.47	3.91	26.04	26.33
35	1.40	0.05	2.63	0.52	1.13	0.99	26.44	1.46	8.96	9.44	26.49	28.12
38	0.54	0.10	0.49	0.26	3.42	1.25	27.07	1.64	27.48	28.51	26.29	38.78
41	0.17	0.43	0.96	0.42	20.49	1.39	33.94	1.79	97.01	> 100	27.39	> 100
44	0.09	0.88	2.10	0.33	48.75	1.09	56.93	1.63	> 100	> 100	31.69	> 100
46	0.00	21.77	67.81	44.75	> 100	68.97	> 100	41.75	> 100	> 100	> 100	> 100
50	-0.02	4.42	7.57	9.98	> 100	6.40	> 100	3.86	> 100	> 100	99.72	> 100

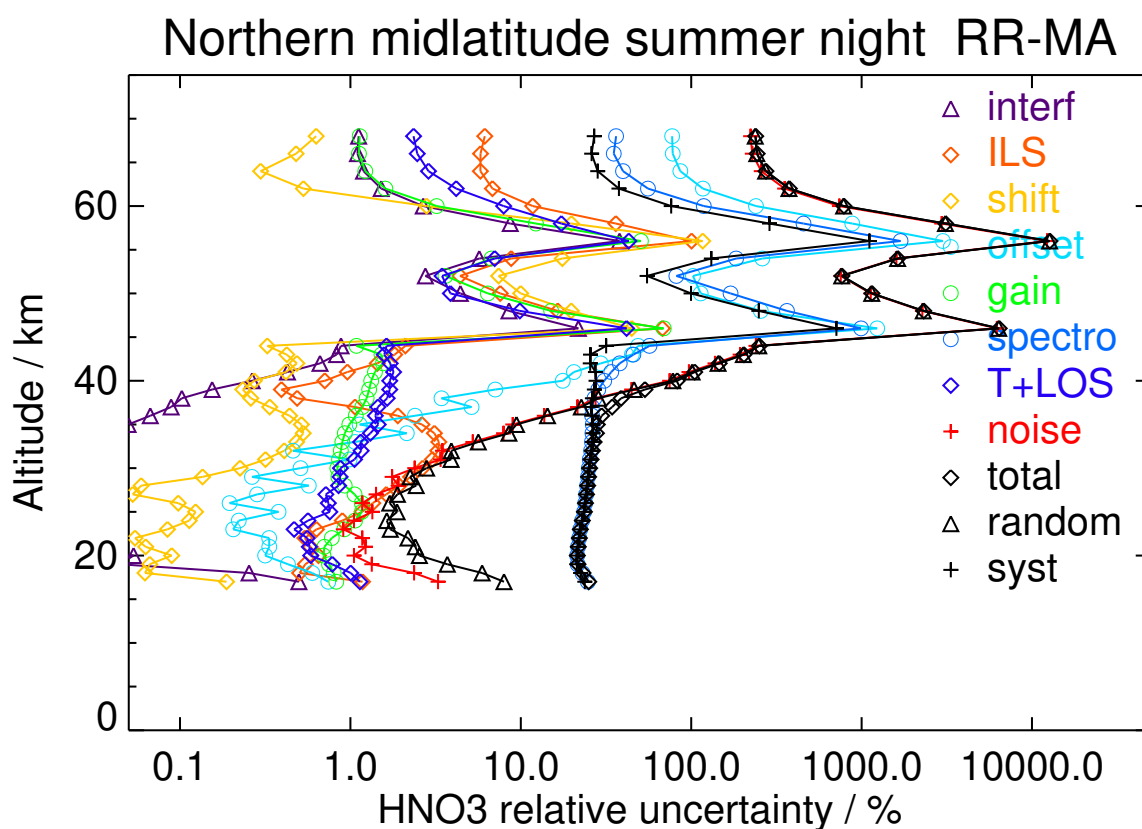


Figure S82: V8R_HNO₃_561 Northern midlatitude summer night

Table S87: HNO₃ error budget for Northern midlatitude autumn day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	4.08	0.36	0.63	0.12	0.71	0.97	25.22	1.08	3.15	8.71	23.94	25.48
20	6.46	0.03	0.81	0.07	0.34	0.93	22.09	0.61	1.03	6.16	21.28	22.16
23	8.91	0.02	0.75	0.11	0.23	0.81	22.48	0.55	1.02	3.86	22.20	22.54
26	8.82	0.01	1.36	0.05	0.20	1.07	23.47	0.72	1.21	2.98	23.39	23.57
29	6.33	0.02	2.31	0.22	0.28	1.05	25.08	1.02	1.86	3.35	25.07	25.30
32	3.21	0.03	3.09	0.44	0.56	1.12	26.89	1.41	4.15	5.79	26.84	27.45
35	1.39	0.05	2.73	0.41	1.31	1.16	27.72	1.52	11.15	13.12	27.08	30.09
38	0.53	0.10	1.32	0.24	4.25	1.23	28.71	1.64	33.35	35.23	26.82	44.28
41	0.18	0.39	0.95	0.25	23.19	1.42	36.41	1.91	> 100	> 100	27.41	> 100
44	0.08	0.90	3.13	0.72	60.56	1.26	59.02	2.61	> 100	> 100	34.98	> 100
46	0.08	0.99	2.90	2.02	55.99	1.94	60.11	1.98	> 100	> 100	38.94	> 100
50	-0.05	1.95	3.96	5.87	76.86	3.58	> 100	3.13	> 100	> 100	62.62	> 100

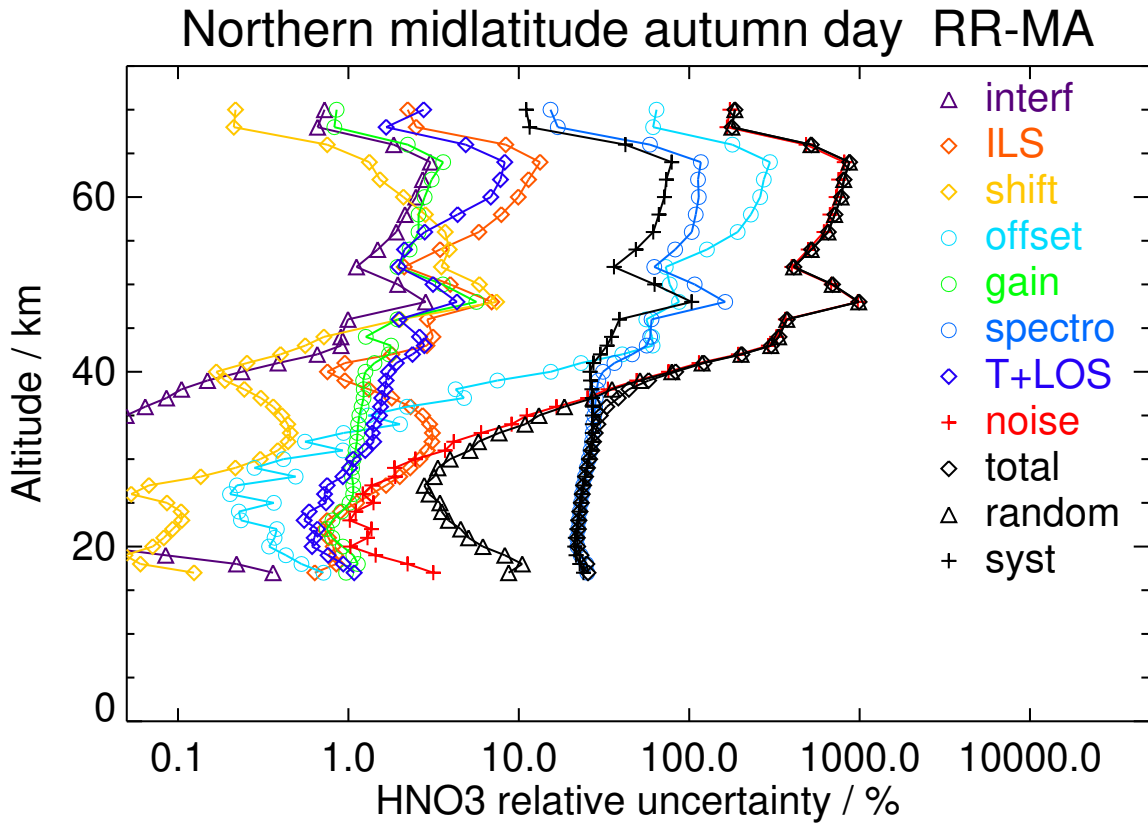


Figure S83: V8R_HNO₃_561 Northern midlatitude autumn day

Table S88: HNO₃ error budget for Northern midlatitude autumn night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	5.01	0.35	1.24	0.12	0.61	1.18	26.74	1.13	2.67	13.31	23.45	26.96
20	6.91	0.04	0.81	0.08	0.34	0.87	21.89	0.58	0.98	5.58	21.24	21.96
23	9.10	0.03	0.78	0.10	0.23	0.83	22.75	0.54	0.99	3.83	22.49	22.81
26	8.51	0.01	1.31	0.05	0.20	1.10	23.92	0.72	1.21	3.13	23.82	24.02
29	6.44	0.01	2.05	0.18	0.27	1.05	25.00	0.92	1.80	2.91	25.02	25.19
32	3.52	0.02	2.89	0.40	0.54	1.14	26.73	1.30	3.79	5.05	26.74	27.21
35	1.62	0.04	2.63	0.36	1.22	1.19	27.42	1.44	9.70	11.26	27.04	29.29
38	0.61	0.09	1.55	0.24	3.97	1.28	28.70	1.73	29.39	30.76	27.63	41.35
41	0.17	0.38	0.88	0.27	24.38	1.39	35.04	2.28	> 100	> 100	29.29	> 100
44	0.04	1.86	5.74	1.32	> 100	2.34	> 100	5.33	> 100	> 100	60.33	> 100
46	-0.04	1.99	5.37	3.63	> 100	3.43	> 100	3.79	> 100	> 100	64.10	> 100
50	-0.02	5.40	11.47	15.60	> 100	9.64	> 100	8.37	> 100	> 100	> 100	> 100

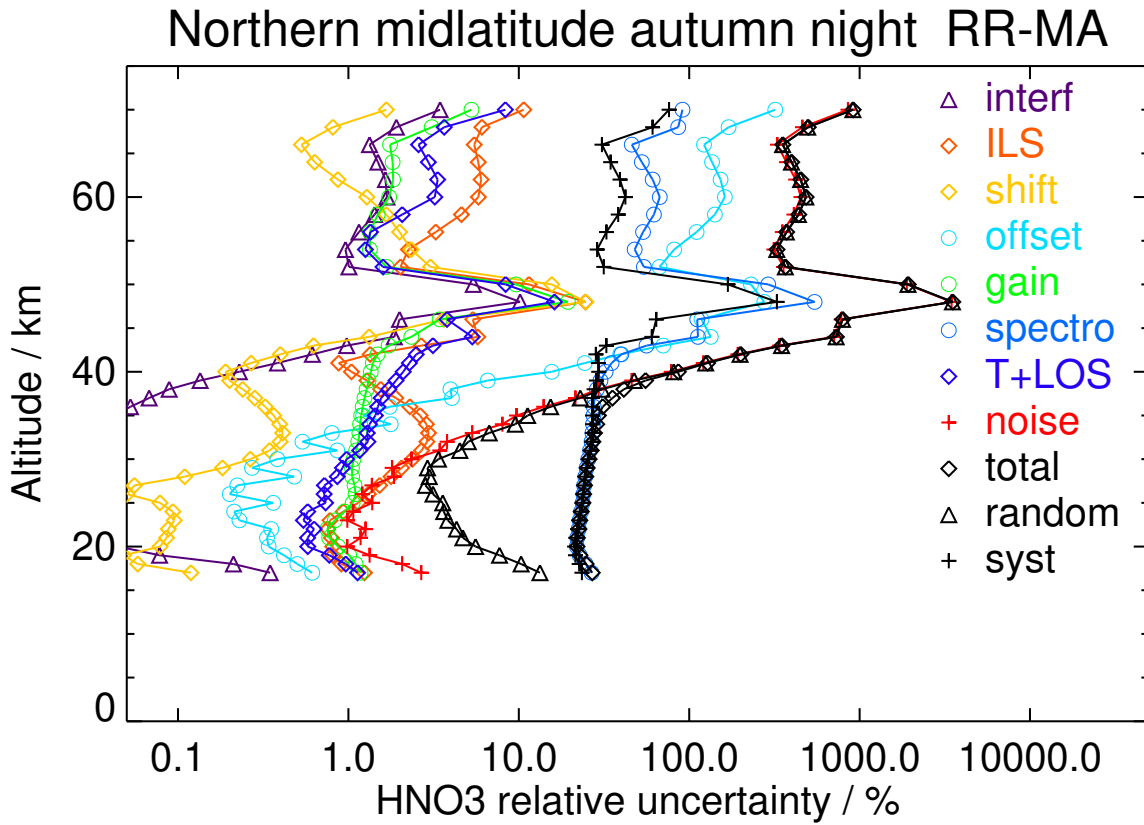


Figure S84: V8R_HNO₃_561 Northern midlatitude autumn night

Table S89: HNO₃ error budget for Tropics day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	0.15	6.49	47.00	1.09	24.12	5.78	> 100	19.24	80.77	> 100	87.90	> 100
20	1.57	0.20	1.73	0.12	0.82	0.54	27.25	1.70	3.59	11.82	24.95	27.61
23	4.03	0.05	0.47	0.12	0.33	0.77	24.86	0.53	1.74	9.27	23.16	24.95
26	4.32	0.02	1.83	0.06	0.23	0.95	25.36	0.71	1.92	7.48	24.41	25.53
29	3.54	0.03	2.22	0.17	0.27	0.78	25.23	0.77	2.72	4.99	25.01	25.50
32	2.54	0.04	2.78	0.34	0.40	0.84	25.57	0.92	4.49	5.52	25.55	26.14
35	1.43	0.06	2.35	0.39	0.83	0.98	26.25	1.14	9.52	10.03	26.22	28.08
38	0.68	0.11	0.78	0.24	2.39	1.06	26.48	1.33	23.20	23.97	25.96	35.34
41	0.18	0.47	0.76	0.42	19.96	1.13	37.97	2.12	98.78	> 100	32.74	> 100
44	0.03	1.94	4.53	0.92	> 100	2.34	> 100	4.17	> 100	> 100	78.82	> 100
46	0.02	4.42	11.67	8.96	> 100	8.07	> 100	6.39	> 100	> 100	> 100	> 100
50	-0.06	1.70	4.49	4.50	37.45	2.66	75.85	1.84	> 100	> 100	48.41	> 100

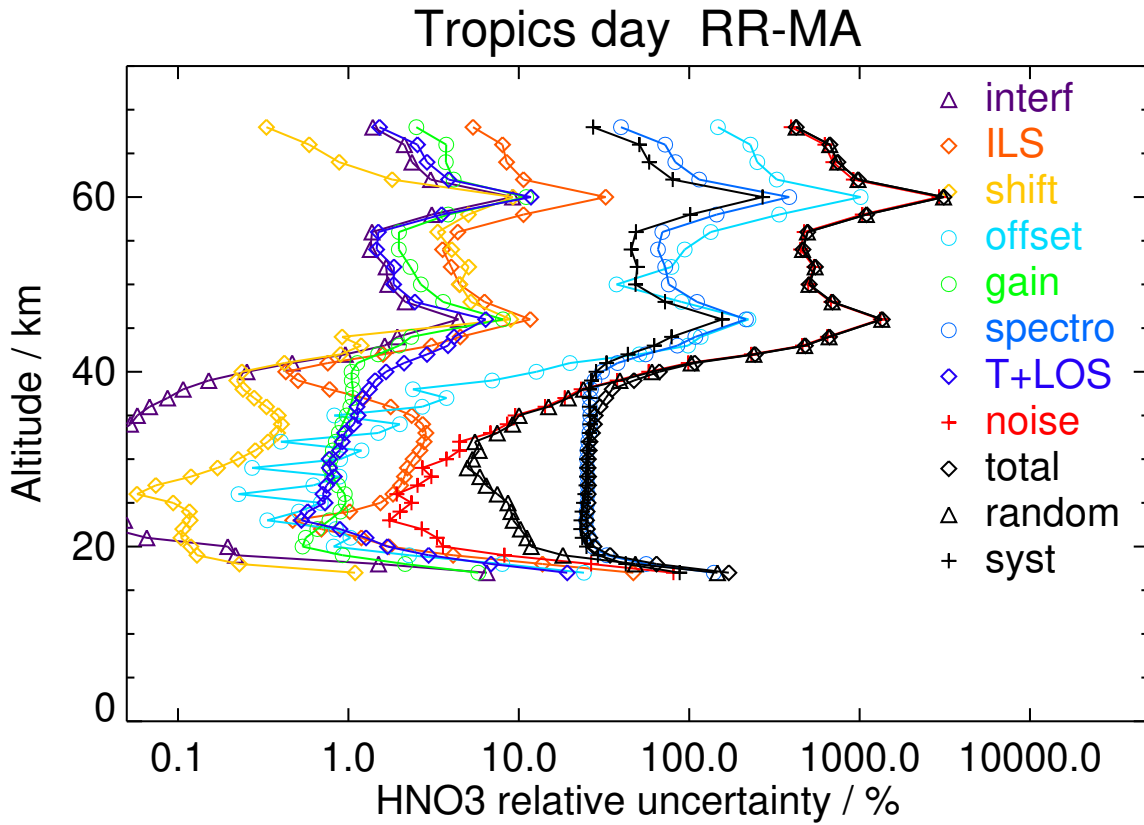


Figure S85: V8R_HNO₃_561 Tropics day

Table S90: HNO₃ error budget for Tropics night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	0.19	4.57	37.13	1.13	19.24	4.48	> 100	14.12	60.87	> 100	63.25	> 100
20	1.65	0.18	1.38	0.14	0.81	0.70	27.20	1.58	3.43	12.03	24.75	27.52
23	4.09	0.04	0.44	0.12	0.36	0.77	24.53	0.54	1.76	9.11	22.87	24.62
26	4.24	0.02	2.00	0.05	0.28	0.93	25.40	0.77	1.97	7.59	24.43	25.58
29	3.36	0.03	2.27	0.19	0.37	0.78	25.37	0.80	2.89	5.56	25.05	25.66
32	2.53	0.04	2.58	0.32	0.54	0.81	25.30	0.86	4.55	5.35	25.31	25.87
35	1.55	0.05	2.38	0.38	1.02	0.95	25.93	1.06	8.94	9.39	25.95	27.59
38	0.73	0.10	1.06	0.28	2.63	1.09	27.02	1.35	22.24	22.96	26.62	35.16
41	0.25	0.32	0.71	0.34	14.79	0.94	32.56	1.66	72.05	75.27	28.45	80.46
44	0.04	1.80	5.32	1.14	> 100	1.70	> 100	4.77	> 100	> 100	78.64	> 100
46	-0.07	1.25	3.33	2.45	68.76	2.24	48.75	1.68	> 100	> 100	27.37	> 100
50	-0.05	2.04	3.56	5.07	52.16	2.04	60.96	1.70	> 100	> 100	44.11	> 100

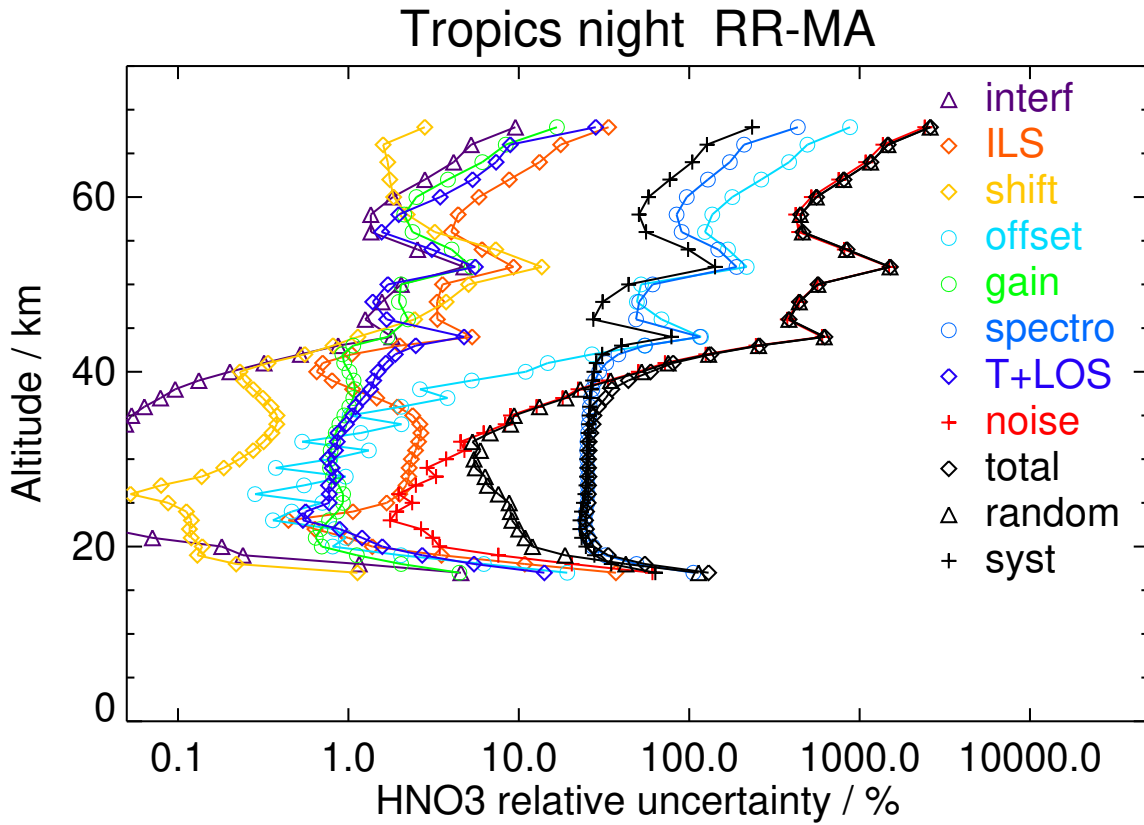


Figure S86: V8R_HNO₃_561 Tropics night

Table S91: HNO₃ error budget for Southern midlatitude winter day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	6.04	0.24	0.43	0.08	0.58	1.02	25.42	1.19	2.65	2.98	25.45	25.62
20	7.07	0.04	0.82	0.07	0.34	0.85	22.88	0.61	0.95	4.22	22.54	22.94
23	9.68	0.02	0.95	0.09	0.27	0.78	23.42	0.60	1.08	3.77	23.19	23.49
26	8.86	0.01	1.61	0.06	0.31	1.12	24.72	0.88	1.36	3.29	24.63	24.85
29	6.00	0.02	2.46	0.23	0.51	1.13	25.96	1.12	2.21	4.34	25.86	26.22
32	3.36	0.03	2.77	0.37	0.96	1.09	26.65	1.28	4.46	6.22	26.51	27.23
35	1.55	0.05	2.89	0.41	2.09	1.12	27.87	1.46	11.05	13.39	27.13	30.25
38	0.49	0.13	2.62	0.36	6.65	1.35	33.77	2.06	39.24	42.91	29.93	52.32
41	0.15	0.51	2.56	0.46	30.62	1.40	37.19	2.63	> 100	> 100	27.53	> 100
44	0.05	1.74	6.64	1.82	> 100	2.66	78.26	5.07	> 100	> 100	35.65	> 100
46	-0.05	1.71	5.53	3.54	> 100	2.76	94.93	3.52	> 100	> 100	46.00	> 100
50	0.04	2.16	5.30	6.77	> 100	3.97	> 100	3.83	> 100	> 100	83.21	> 100

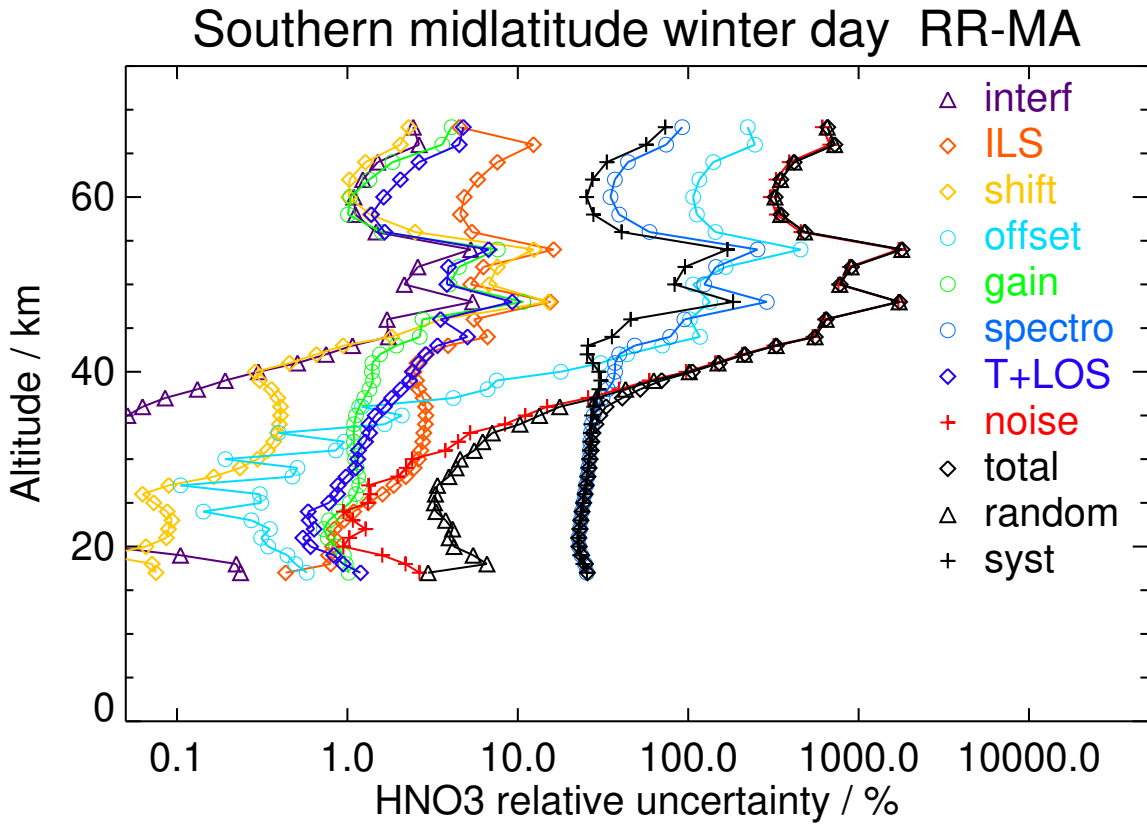


Figure S87: V8R_HNO₃_561 Southern midlatitude winter day

Table S92: HNO₃ error budget for Southern midlatitude winter night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	6.04	0.23	0.57	0.07	0.53	1.05	22.70	1.04	2.45	4.86	22.38	22.90
20	7.46	0.04	0.77	0.07	0.34	0.88	20.46	0.63	0.96	3.83	20.17	20.53
23	10.16	0.02	1.00	0.08	0.25	0.72	21.49	0.63	1.09	2.58	21.41	21.56
26	9.19	0.01	1.75	0.10	0.28	1.02	23.44	0.95	1.40	3.56	23.32	23.59
29	6.08	0.02	2.46	0.22	0.47	1.08	25.81	1.27	2.39	6.21	25.35	26.10
32	3.16	0.03	2.79	0.30	0.92	1.09	27.99	1.51	5.20	10.09	26.85	28.68
35	1.33	0.06	3.01	0.29	2.20	1.12	30.40	1.69	13.84	18.85	27.90	33.67
38	0.43	0.16	3.05	0.29	7.62	1.17	34.13	2.20	47.25	51.36	28.86	58.91
41	0.12	0.62	3.40	0.65	40.80	1.38	41.33	3.10	> 100	> 100	25.30	> 100
44	-0.01	12.48	55.66	13.80	> 100	18.44	> 100	37.17	> 100	> 100	> 100	> 100
46	-0.08	1.04	2.98	2.05	63.65	1.30	45.53	1.89	> 100	> 100	19.20	> 100
50	0.04	2.55	4.83	8.29	> 100	4.31	> 100	3.82	> 100	> 100	82.81	> 100

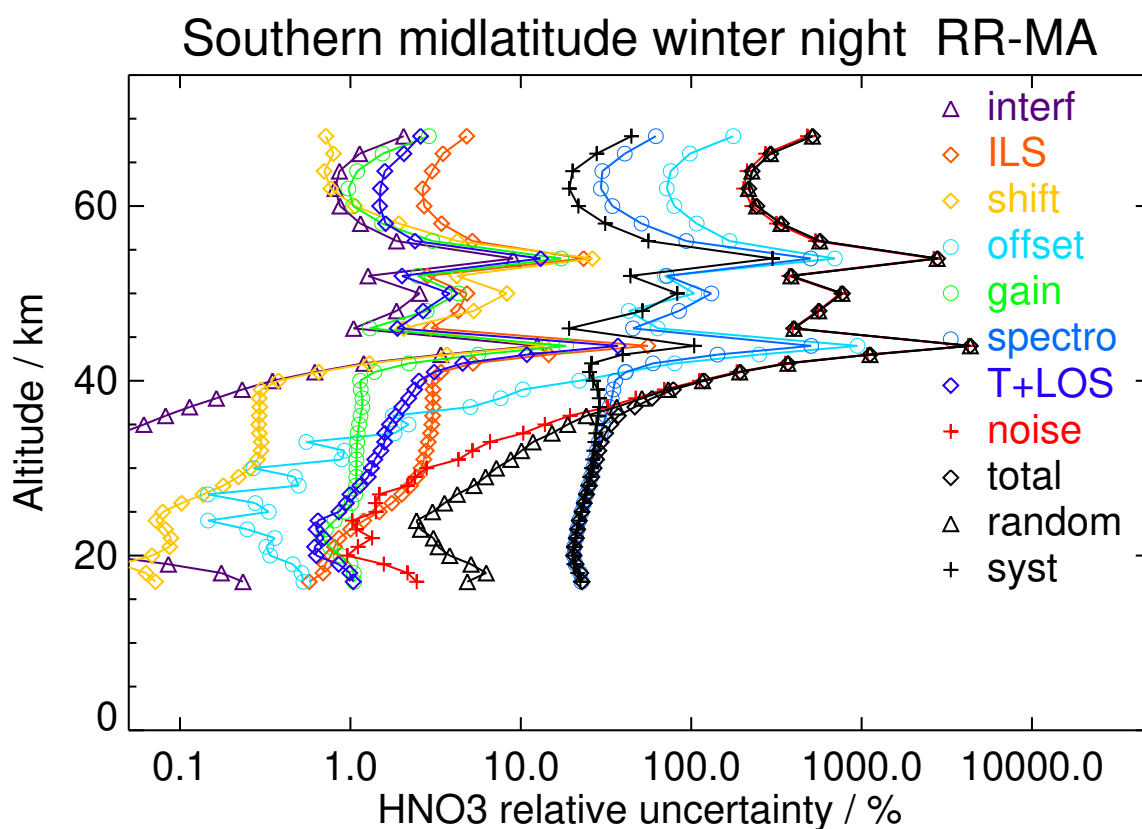


Figure S88: V8R_HNO₃_561 Southern midlatitude winter night

Table S93: HNO₃ error budget for Southern midlatitude spring day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
20	7.97	0.02	0.99	0.05	0.32	1.15	21.03	0.60	0.85	4.57	20.61	21.11
23	9.26	0.02	1.09	0.07	0.25	0.90	22.37	0.65	1.00	2.19	22.34	22.45
26	7.41	0.02	1.53	0.06	0.36	1.17	24.00	0.85	1.39	4.01	23.80	24.14
29	5.05	0.02	1.94	0.17	0.59	1.02	25.33	0.91	2.28	6.05	24.82	25.55
32	3.22	0.03	2.40	0.35	0.99	1.05	25.93	1.04	4.23	7.57	25.34	26.45
35	1.49	0.05	3.05	0.48	2.25	1.20	28.01	1.41	10.75	13.25	27.25	30.30
38	0.50	0.11	2.03	0.37	6.60	1.34	30.17	1.82	36.69	38.66	28.55	48.06
41	0.17	0.37	1.13	0.32	25.52	1.41	36.76	1.90	> 100	> 100	27.19	> 100
44	0.06	1.30	4.33	1.02	96.09	2.50	70.20	3.48	> 100	> 100	37.92	> 100
46	-0.00	37.40	> 100	61.90	> 100	65.67	> 100	80.25	> 100	> 100	> 100	> 100
50	-0.08	1.17	2.58	3.63	54.51	2.18	70.99	1.72	> 100	> 100	43.07	> 100

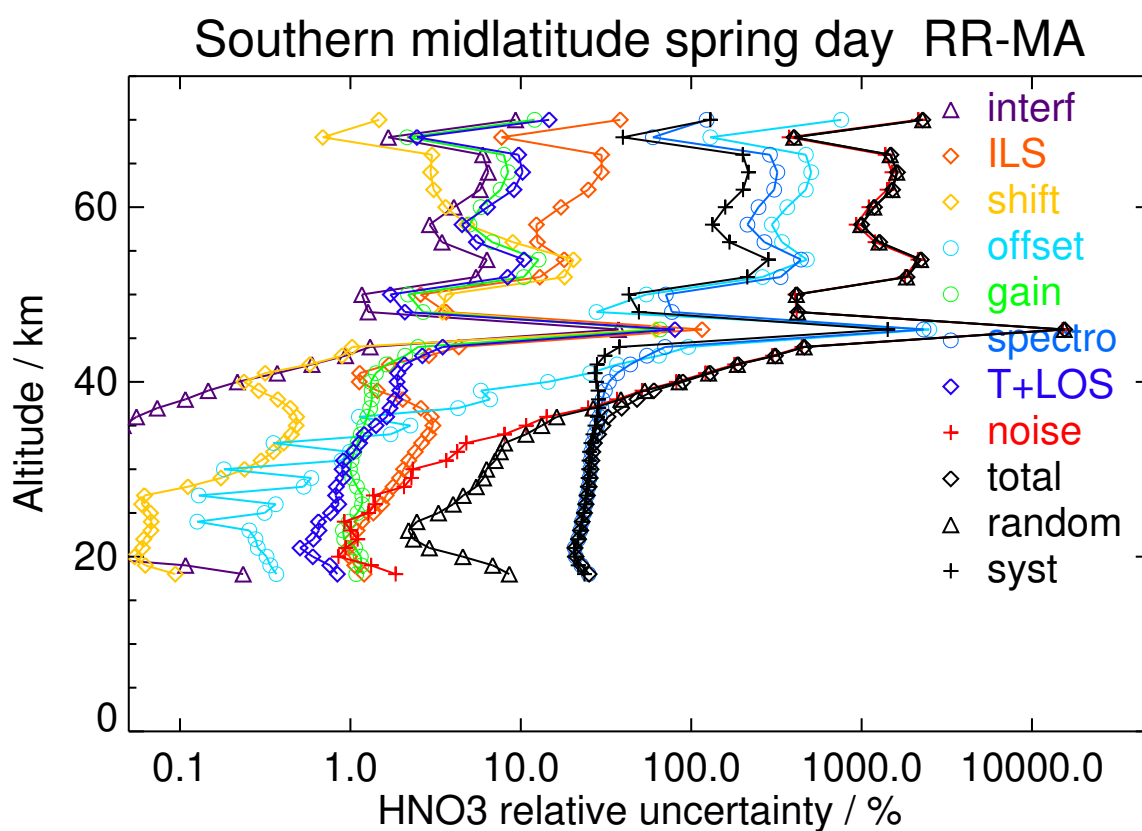


Figure S89: V8R_HNO₃_561 Southern midlatitude spring day

Table S94: HNO₃ error budget for Southern midlatitude spring night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	5.27	0.38	0.42	0.10	0.47	0.83	25.34	0.79	2.46	5.07	24.99	25.50
20	7.35	0.03	0.80	0.06	0.34	0.91	22.14	0.55	0.89	3.83	21.87	22.20
23	9.27	0.03	1.07	0.08	0.22	0.91	23.14	0.59	0.96	2.48	23.08	23.21
26	7.35	0.02	1.81	0.08	0.29	1.29	24.82	0.88	1.34	3.86	24.67	24.98
29	4.77	0.02	2.41	0.22	0.46	1.07	25.80	1.01	2.27	5.50	25.47	26.05
32	2.83	0.03	2.72	0.37	0.81	1.12	26.68	1.13	4.45	7.91	26.07	27.24
35	1.46	0.05	2.68	0.40	1.71	1.22	27.45	1.28	10.32	13.01	26.53	29.55
38	0.53	0.10	1.56	0.33	5.08	1.48	30.78	1.80	33.05	35.57	28.42	45.53
41	0.06	1.11	3.10	0.81	65.15	3.45	81.13	5.26	> 100	> 100	57.69	> 100
44	0.04	2.19	8.38	1.32	> 100	3.62	99.16	5.00	> 100	> 100	44.07	> 100
46	0.03	2.59	8.41	4.99	> 100	5.39	> 100	5.19	> 100	> 100	> 100	> 100
50	0.05	1.86	5.44	5.50	71.84	3.77	99.37	2.48	> 100	> 100	64.41	> 100

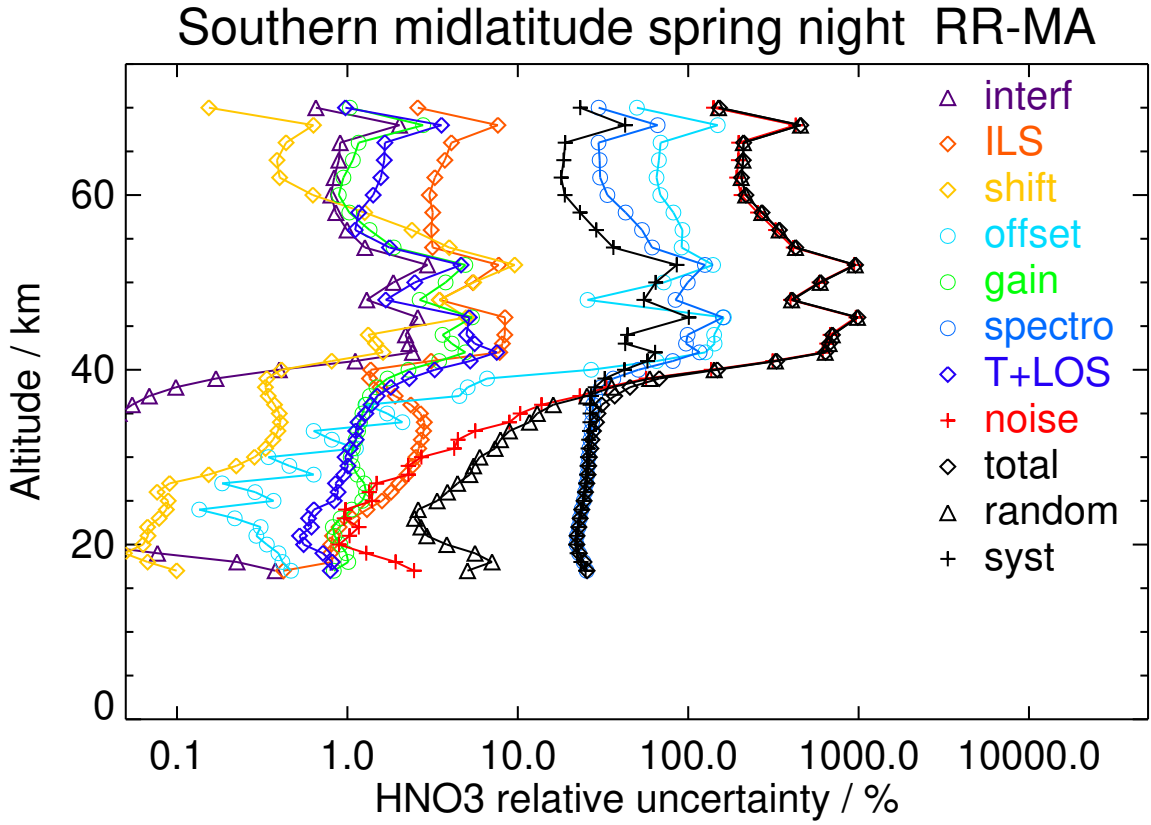


Figure S90: V8R_HNO₃_561 Southern midlatitude spring night

Table S95: HNO₃ error budget for Southern midlatitude summer day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	2.19	0.57	2.30	0.20	1.18	0.90	26.42	1.47	4.15	14.18	22.89	26.93
20	4.82	0.07	0.57	0.09	0.42	0.59	21.91	0.69	1.43	4.15	21.60	21.99
23	7.46	0.03	0.49	0.10	0.23	0.90	22.35	0.43	0.98	2.50	22.26	22.40
26	7.32	0.02	1.24	0.07	0.15	1.07	23.64	0.59	1.12	1.96	23.65	23.73
29	5.55	0.02	2.36	0.17	0.21	0.85	24.82	0.79	1.67	2.25	24.92	25.02
32	3.19	0.03	3.34	0.47	0.42	0.85	25.89	1.10	3.38	3.82	26.09	26.37
35	1.50	0.05	2.35	0.46	0.97	1.00	26.38	1.34	8.50	8.99	26.39	27.88
38	0.60	0.10	0.48	0.22	2.92	1.20	26.96	1.55	24.80	25.92	26.12	36.80
41	0.17	0.47	1.12	0.39	22.19	1.26	34.12	2.06	> 100	> 100	28.23	> 100
44	0.07	0.98	2.05	0.60	57.74	1.39	49.21	1.93	> 100	> 100	33.54	> 100
46	0.05	1.55	4.16	3.40	83.37	3.56	83.37	2.11	> 100	> 100	57.56	> 100
50	-0.11	0.88	1.65	2.33	22.13	1.33	30.98	0.93	> 100	> 100	16.06	> 100

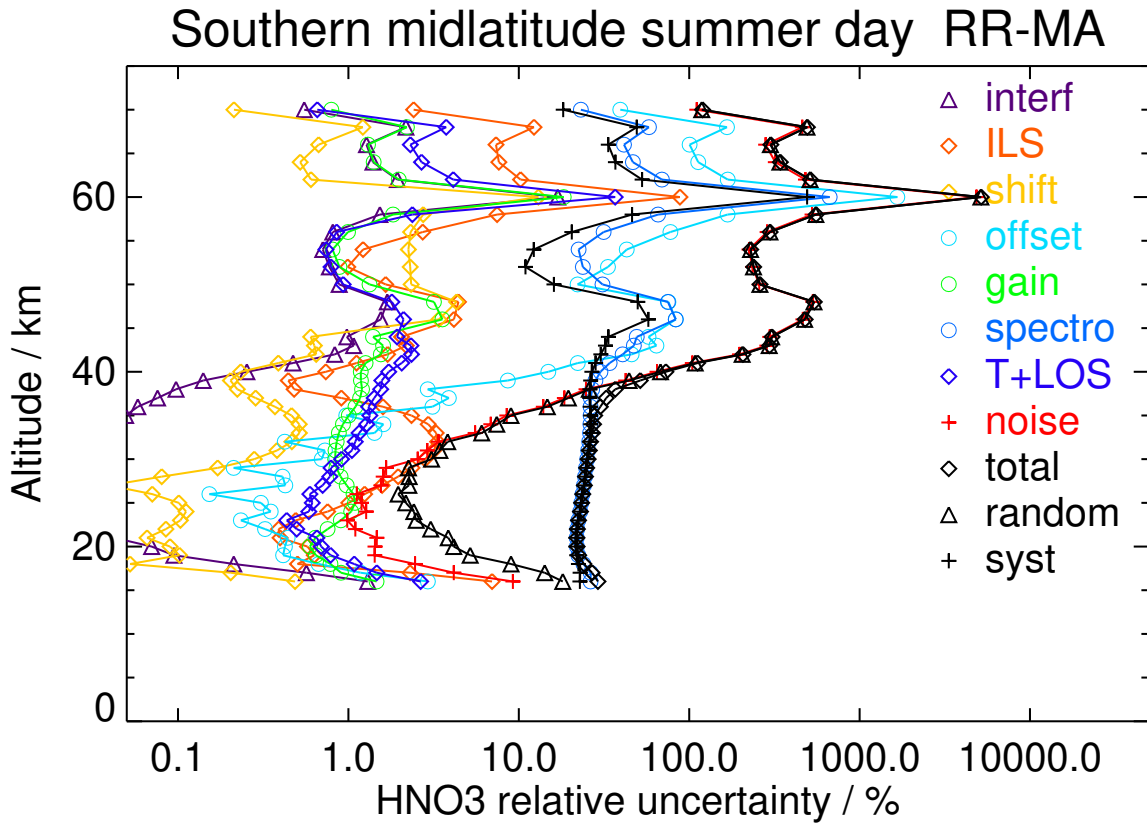


Figure S91: V8R_HNO₃_561 Southern midlatitude summer day

Table S96: HNO₃ error budget for Southern midlatitude summer night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	1.96	0.63	2.99	0.28	1.47	0.66	27.68	1.76	5.04	12.49	25.51	28.40
20	4.56	0.07	0.62	0.10	0.38	0.55	23.57	0.65	1.34	4.39	23.23	23.64
23	7.26	0.03	0.49	0.10	0.23	0.89	23.17	0.44	0.99	2.44	23.09	23.22
26	7.02	0.01	1.32	0.09	0.17	1.11	24.12	0.63	1.18	1.84	24.15	24.22
29	5.47	0.01	2.46	0.17	0.24	0.88	24.89	0.81	1.70	2.32	24.99	25.10
32	3.10	0.03	3.70	0.50	0.47	0.91	26.11	1.15	3.49	3.95	26.35	26.65
35	1.48	0.05	2.64	0.51	1.10	1.00	26.13	1.37	8.60	9.14	26.16	27.71
38	0.52	0.11	0.49	0.29	3.74	1.33	28.42	1.75	28.95	29.98	27.67	40.80
41	0.22	0.35	0.80	0.28	16.90	1.07	27.90	1.27	76.12	79.20	24.28	82.84
44	0.17	0.46	0.85	0.27	26.74	0.75	29.68	0.91	> 100	> 100	23.93	> 100
46	0.03	2.82	9.36	5.92	> 100	7.52	> 100	4.54	> 100	> 100	> 100	> 100
50	-0.05	2.05	3.37	4.99	61.04	2.83	77.50	1.99	> 100	> 100	49.22	> 100

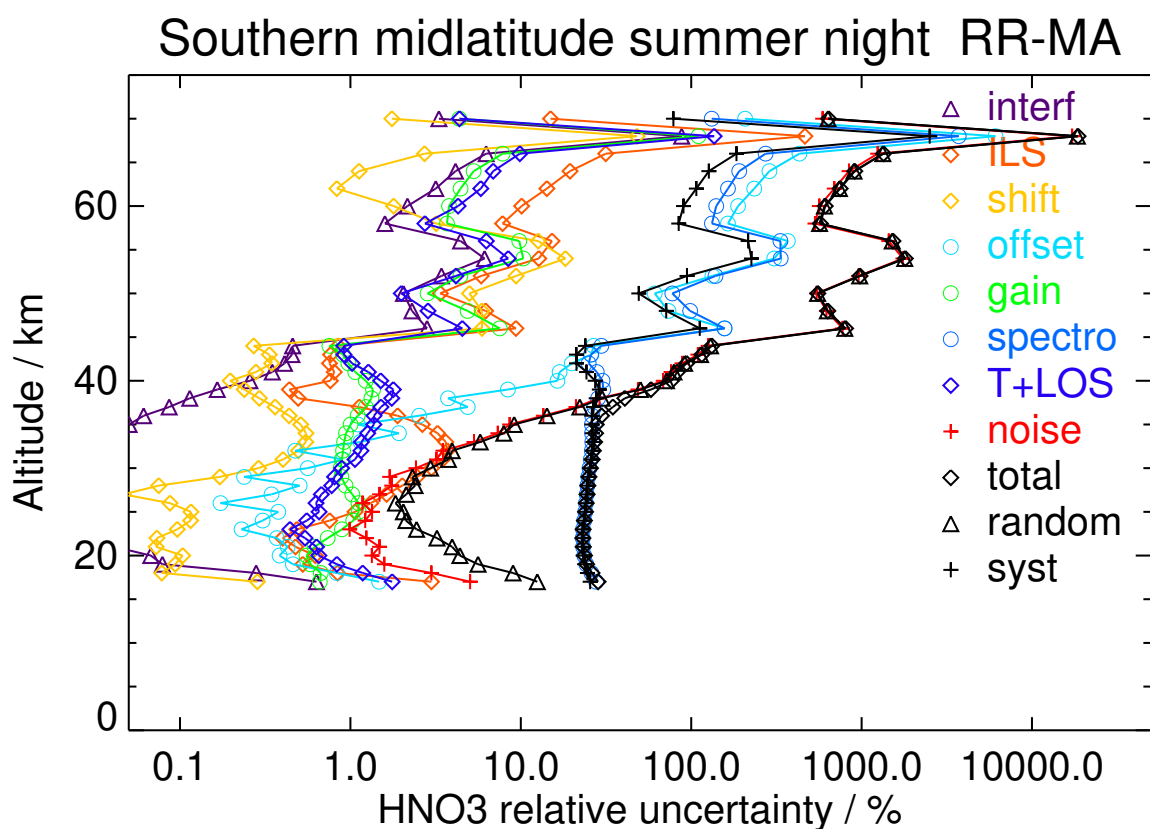


Figure S92: V8R_HNO₃_561 Southern midlatitude summer night

Table S97: HNO₃ error budget for Southern midlatitude autumn day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
20	4.95	0.04	0.50	0.09	0.39	0.65	23.17	0.77	1.16	6.40	22.34	23.23
23	8.79	0.02	0.60	0.10	0.31	0.66	22.75	0.56	1.09	3.99	22.45	22.80
26	8.86	0.01	1.43	0.05	0.29	1.09	24.15	0.76	1.26	3.53	24.01	24.26
29	6.40	0.02	2.31	0.22	0.45	1.09	25.34	0.99	1.93	3.21	25.36	25.56
32	3.63	0.02	2.93	0.40	0.86	1.11	26.37	1.25	3.90	4.83	26.45	26.89
35	1.66	0.04	3.07	0.42	1.95	1.17	27.40	1.47	9.89	11.02	27.28	29.42
38	0.56	0.11	2.03	0.31	5.74	1.28	29.87	1.90	33.44	34.95	28.83	45.31
41	0.17	0.34	1.07	0.27	24.92	1.34	36.31	2.10	> 100	> 100	27.87	> 100
44	0.04	1.74	6.10	1.27	> 100	2.90	> 100	4.84	> 100	> 100	56.19	> 100
46	0.07	1.10	3.76	1.90	74.62	1.77	69.82	2.35	> 100	> 100	42.51	> 100
50	-0.04	2.06	4.60	6.39	> 100	4.24	> 100	3.38	> 100	> 100	87.35	> 100

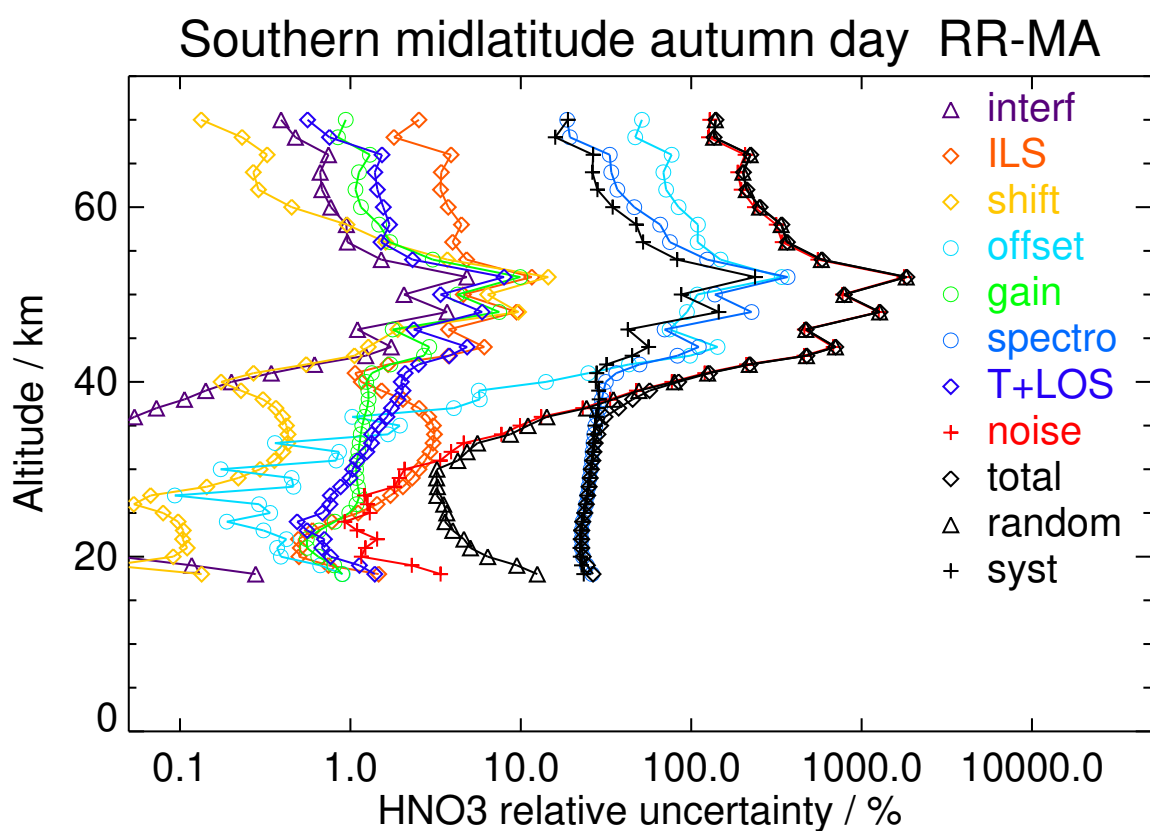


Figure S93: V8R_HNO₃_561 Southern midlatitude autumn day

Table S98: HNO₃ error budget for Southern midlatitude autumn night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
20	4.92	0.04	0.61	0.09	0.38	0.70	23.12	0.75	1.15	6.81	22.16	23.18
23	8.63	0.02	0.64	0.10	0.30	0.70	22.39	0.54	1.09	4.20	22.05	22.45
26	8.84	0.01	1.31	0.06	0.28	1.05	23.52	0.73	1.26	2.87	23.45	23.63
29	6.53	0.02	2.16	0.20	0.42	1.05	24.81	0.97	1.90	2.70	24.88	25.02
32	3.64	0.02	2.93	0.42	0.81	1.08	26.22	1.28	3.86	4.76	26.31	26.73
35	1.61	0.04	3.01	0.43	1.88	1.13	27.35	1.49	10.09	11.10	27.26	29.43
38	0.54	0.10	2.00	0.33	5.66	1.24	29.85	1.89	34.33	35.89	28.68	45.94
41	0.20	0.34	0.76	0.21	21.97	1.16	30.85	1.67	> 100	> 100	25.58	> 100
44	0.15	0.51	1.54	0.39	37.03	0.90	33.79	1.30	> 100	> 100	22.28	> 100
46	0.05	1.59	5.28	2.98	> 100	2.82	> 100	3.40	> 100	> 100	72.90	> 100
50	-0.07	1.40	3.04	4.20	69.81	2.30	66.91	2.20	> 100	> 100	46.73	> 100

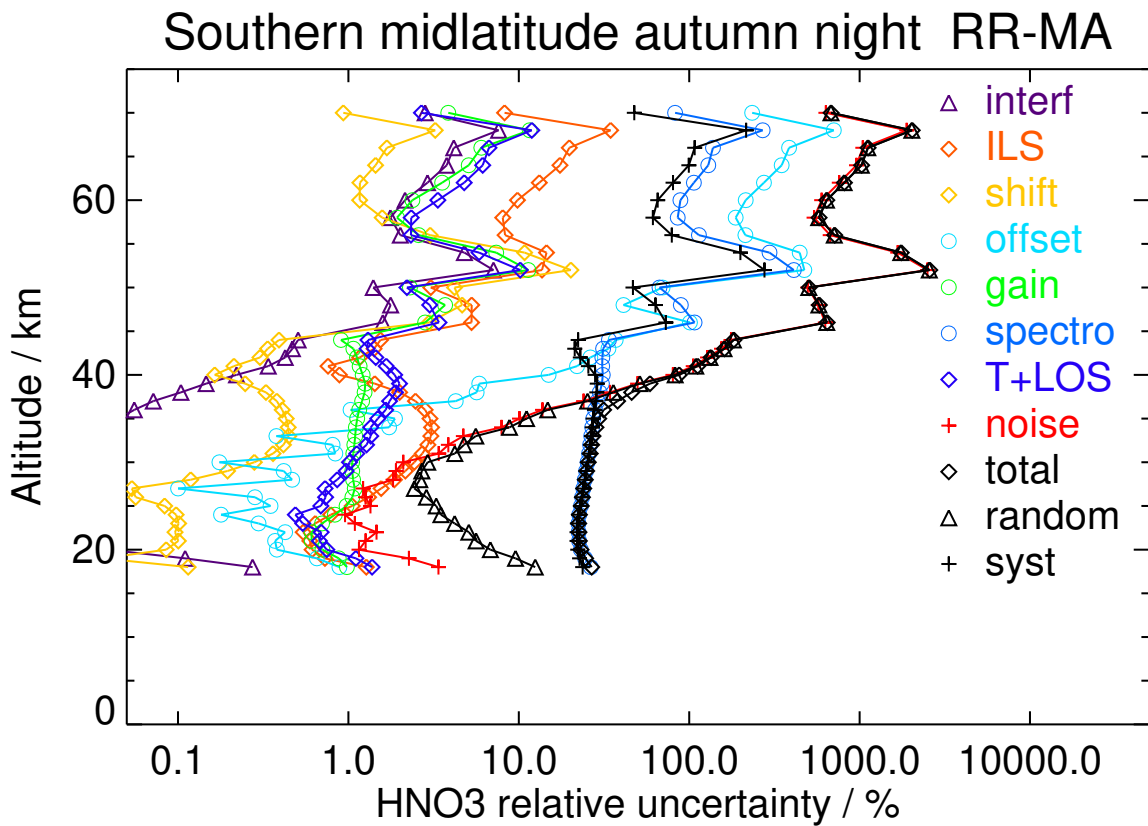


Figure S94: V8R_HNO₃_561 Southern midlatitude autumn night

Table S99: HNO₃ error budget for Southern polar winter day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	9.01	0.22	1.12	0.03	0.62	1.43	26.27	1.66	2.38	4.53	26.11	26.50
20	6.80	0.09	1.64	0.11	0.48	1.30	27.72	1.16	1.51	13.97	24.12	27.87
23	8.47	0.02	2.43	0.10	0.34	0.72	25.30	1.14	1.78	9.08	23.85	25.52
26	6.21	0.01	4.02	0.35	0.52	0.75	26.48	1.63	2.59	6.95	26.06	26.97
29	3.08	0.03	4.69	0.47	1.07	0.67	28.33	1.90	5.35	8.99	27.89	29.30
32	1.48	0.06	3.91	0.36	2.19	0.53	28.19	1.72	12.00	16.18	26.46	31.02
35	0.58	0.11	3.91	0.29	5.45	0.45	32.69	1.85	33.31	38.17	27.75	47.19
38	0.22	0.25	3.95	0.44	16.21	0.71	34.01	2.08	94.99	98.75	26.70	> 100
41	-0.01	5.64	26.36	7.08	> 100	15.57	> 100	21.88	> 100	> 100	> 100	> 100
44	-0.03	2.11	11.81	2.71	> 100	6.67	> 100	7.51	> 100	> 100	63.69	> 100
46	-0.00	20.12	52.57	38.79	> 100	26.57	> 100	35.12	> 100	> 100	> 100	> 100
50	-0.08	1.47	3.43	5.02	59.14	2.43	72.12	1.71	> 100	> 100	48.88	> 100

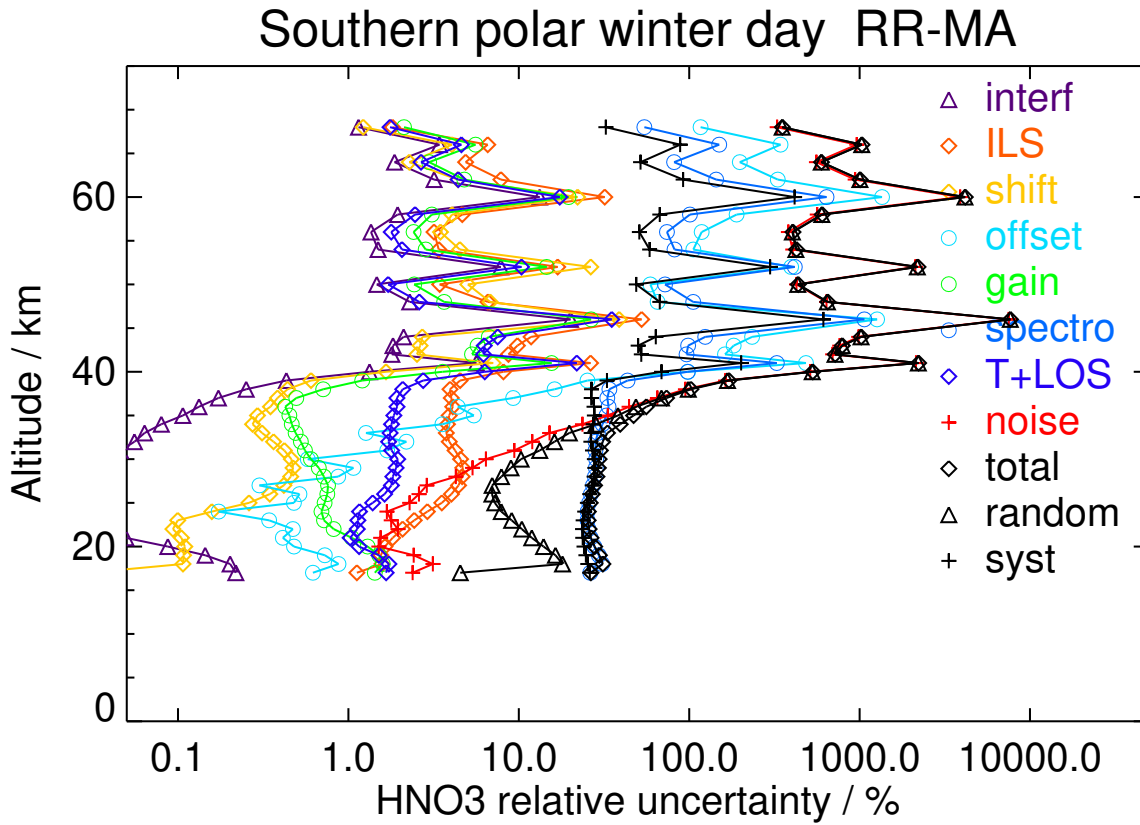


Figure S95: V8R_HNO₃_561 Southern polar winter day

Table S100: HNO₃ error budget for Southern polar winter night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
20	6.27	0.07	1.24	0.11	0.53	1.36	24.23	1.12	1.70	13.72	20.16	24.39
23	8.30	0.02	1.79	0.09	0.42	0.79	23.77	1.03	1.85	10.76	21.39	23.95
26	6.77	0.01	3.54	0.30	0.54	0.83	25.52	1.43	2.44	8.59	24.48	25.94
29	3.53	0.03	4.78	0.48	1.05	0.74	28.26	1.87	4.92	9.76	27.49	29.17
32	1.56	0.05	4.27	0.41	2.25	0.60	28.74	1.84	11.65	15.54	27.34	31.45
35	0.64	0.10	3.47	0.29	5.18	0.58	31.16	1.82	30.73	35.49	26.43	44.25
38	0.19	0.28	4.65	0.62	18.35	0.68	43.43	2.46	> 100	> 100	30.56	> 100
41	-0.01	5.79	34.13	9.18	> 100	13.37	> 100	22.88	> 100	> 100	> 100	> 100
44	-0.07	0.84	5.42	1.36	93.01	2.13	42.11	2.58	> 100	> 100	14.55	> 100
46	-0.07	1.25	4.05	2.43	77.95	1.90	62.48	2.26	> 100	> 100	31.22	> 100
50	0.02	5.03	13.24	17.23	> 100	8.13	> 100	6.14	> 100	> 100	> 100	> 100

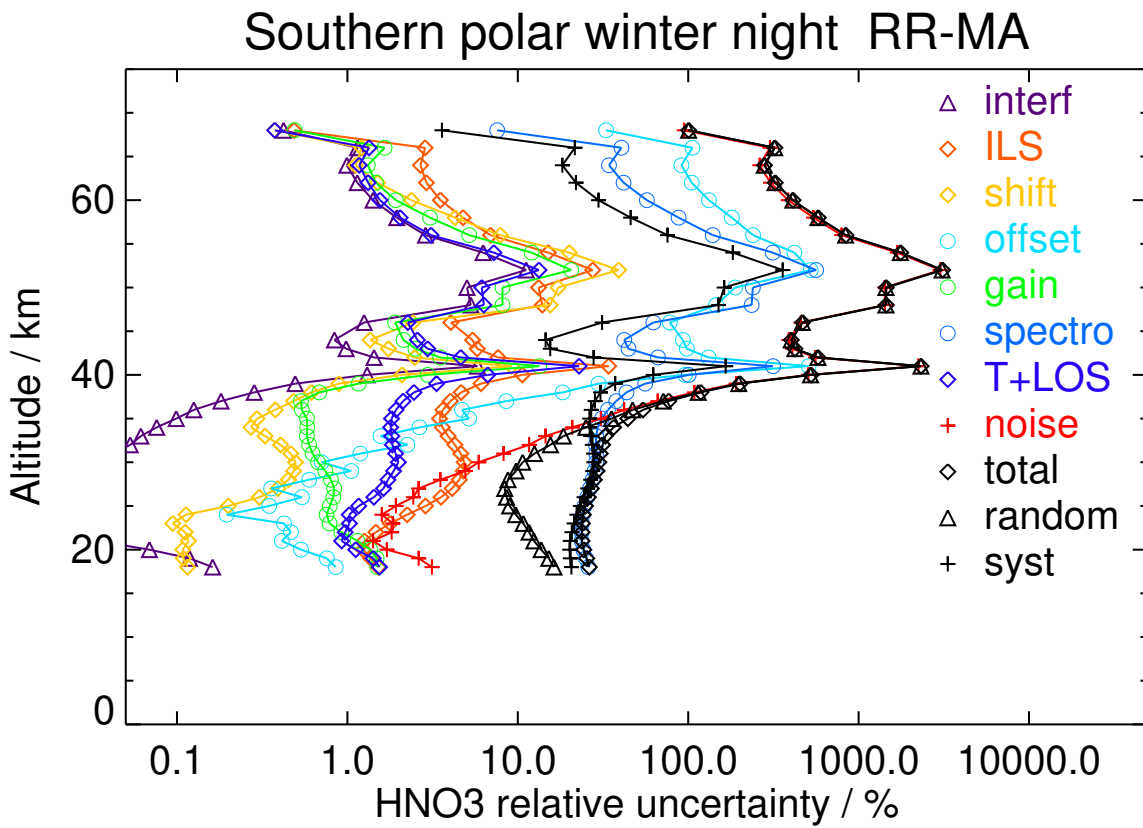


Figure S96: V8R_HNO₃_561 Southern polar winter night

Table S101: HNO₃ error budget for Southern polar spring day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
20	4.08	0.07	1.99	0.10	0.54	1.69	27.20	1.02	1.64	15.77	22.40	27.40
23	5.87	0.03	1.17	0.05	0.39	0.90	24.04	0.65	1.44	5.91	23.41	24.14
26	3.97	0.04	3.34	0.19	0.67	1.15	27.05	1.12	2.30	10.99	25.11	27.41
29	2.59	0.04	2.19	0.21	1.13	1.15	29.62	0.83	3.97	16.95	24.77	30.02
32	1.81	0.04	3.02	0.46	1.80	1.22	29.38	0.90	6.77	16.97	25.22	30.40
35	0.89	0.05	3.53	0.61	4.05	1.37	29.99	1.25	16.62	22.32	26.64	34.76
38	0.37	0.11	1.62	0.32	9.86	1.49	30.57	1.39	46.79	50.26	26.48	56.81
41	0.12	0.37	1.03	0.65	33.91	1.77	39.35	1.81	> 100	> 100	31.14	> 100
44	0.08	0.73	2.07	1.63	73.57	2.12	52.83	1.48	> 100	> 100	32.10	> 100
46	0.01	5.28	17.98	7.56	> 100	8.45	> 100	7.41	> 100	> 100	> 100	> 100
50	-0.02	4.99	12.58	14.99	> 100	6.67	> 100	5.40	> 100	> 100	> 100	> 100

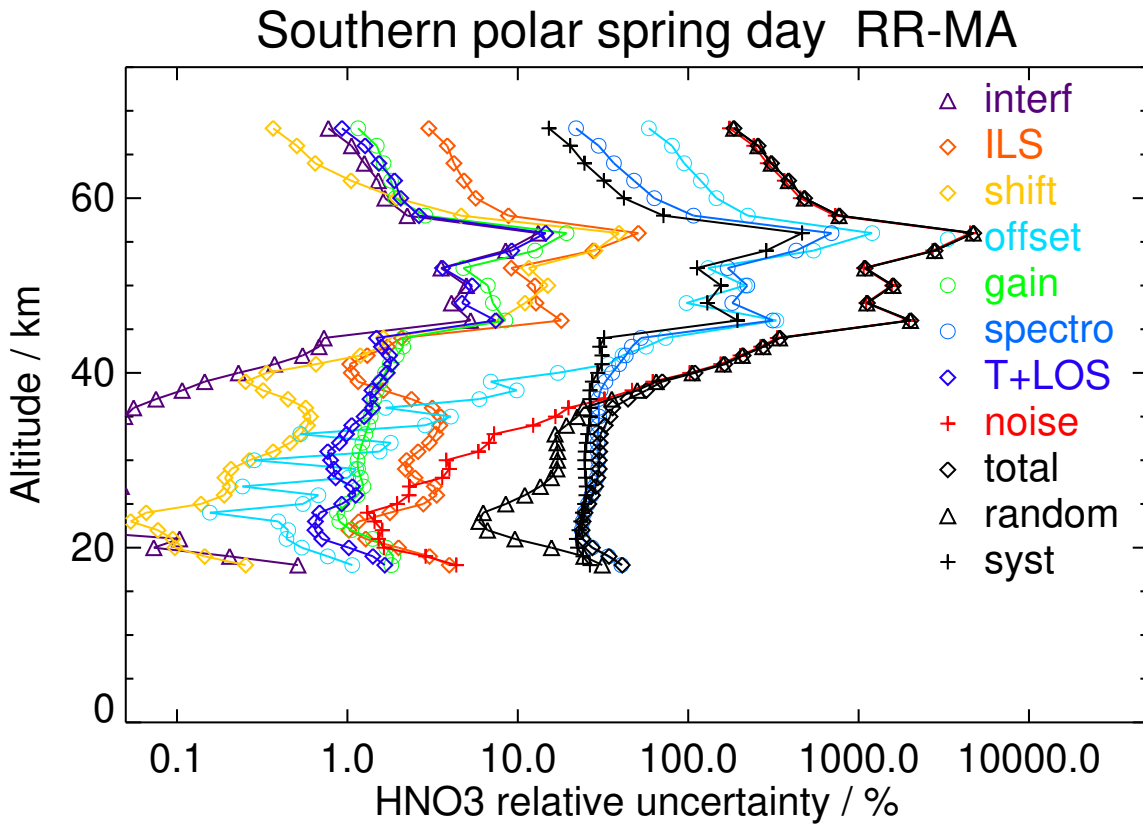


Figure S97: V8R_HNO₃_561 Southern polar spring day

Table S102: HNO₃ error budget for Southern polar spring night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
20	5.78	0.04	1.49	0.08	0.42	1.46	25.05	0.79	1.15	13.23	21.42	25.18
23	6.52	0.03	1.43	0.07	0.35	1.05	24.72	0.75	1.30	7.15	23.78	24.83
26	4.75	0.03	2.89	0.17	0.53	1.21	26.53	0.98	1.90	9.12	25.21	26.81
29	3.09	0.03	2.75	0.27	0.86	1.21	28.93	0.92	3.26	14.24	25.60	29.30
32	1.94	0.03	3.47	0.50	1.50	1.32	29.27	1.02	6.21	15.50	25.93	30.21
35	0.91	0.05	3.53	0.54	3.53	1.57	31.16	1.36	15.88	22.75	27.11	35.39
38	0.31	0.13	1.67	0.36	10.62	1.94	34.02	1.78	54.53	58.59	28.66	65.22
41	0.04	1.42	3.25	2.00	> 100	5.06	96.93	4.81	> 100	> 100	71.17	> 100
44	0.06	1.00	2.89	1.57	88.20	2.19	52.56	1.62	> 100	> 100	31.95	> 100
46	0.03	2.45	7.49	3.97	> 100	3.46	> 100	3.42	> 100	> 100	91.50	> 100
50	0.04	2.41	4.84	6.97	> 100	3.45	> 100	2.65	> 100	> 100	89.80	> 100

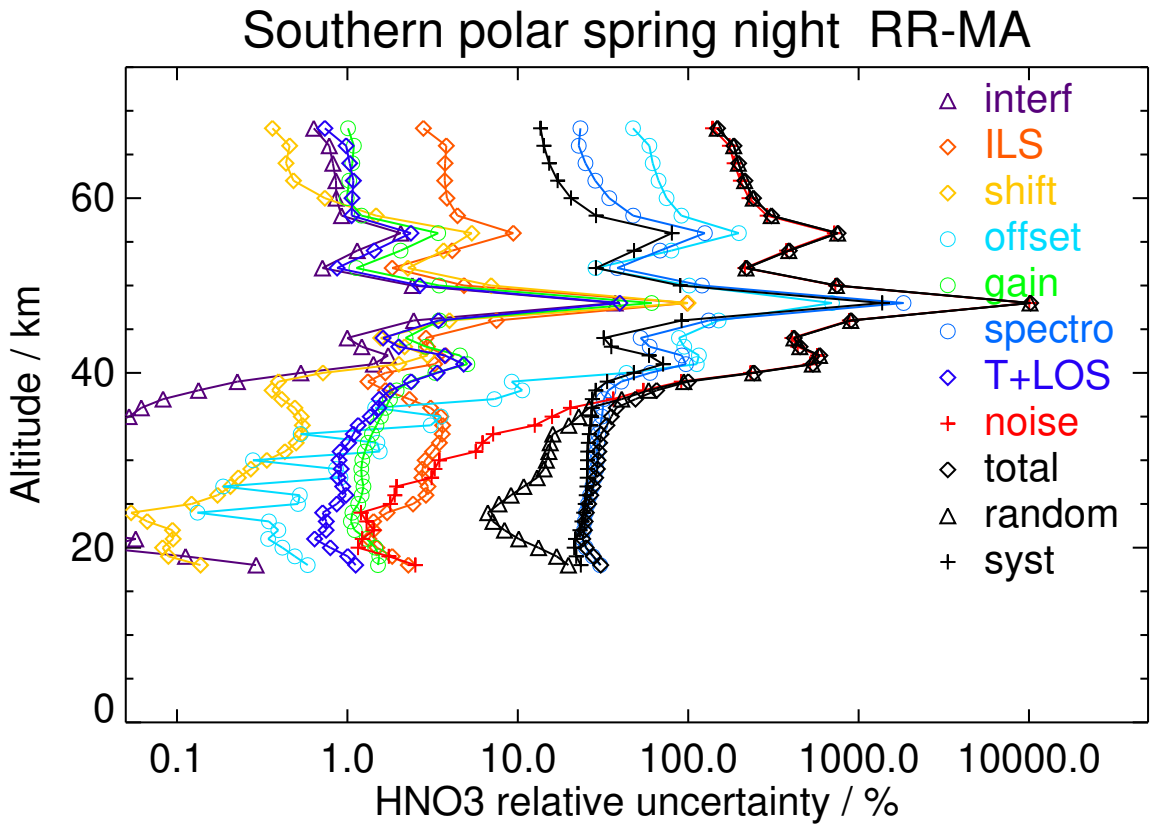


Figure S98: V8R_HNO₃_561 Southern polar spring night

Table S103: HNO₃ error budget for Southern polar summer day. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	4.29	0.47	0.26	0.11	0.49	0.81	24.49	0.63	2.41	3.41	24.40	24.64
20	6.03	0.05	0.69	0.06	0.30	0.96	21.30	0.43	0.90	1.82	21.28	21.36
23	7.98	0.04	0.52	0.05	0.25	0.90	22.92	0.44	0.91	1.57	22.91	22.96
26	8.11	0.01	0.99	0.12	0.29	1.18	23.65	0.59	1.07	1.96	23.65	23.73
29	6.13	< 0.01	2.32	0.10	0.44	0.92	24.95	0.83	1.62	3.03	24.97	25.15
32	3.53	0.02	3.80	0.51	0.88	0.86	25.84	1.13	3.29	4.58	25.98	26.38
35	1.53	0.03	3.35	0.71	2.27	0.93	26.81	1.46	8.94	10.19	26.74	28.61
38	0.59	0.08	0.60	0.37	6.17	1.23	26.35	1.54	26.97	28.39	25.65	38.26
41	0.18	0.35	1.34	0.35	24.36	1.24	32.99	1.72	97.98	> 100	26.63	> 100
44	0.06	1.53	3.83	1.63	> 100	2.41	63.39	2.81	> 100	> 100	31.14	> 100
46	-0.09	0.99	1.82	1.55	51.19	1.58	31.95	1.20	> 100	> 100	13.37	> 100
50	0.05	2.46	3.74	5.60	> 100	3.97	99.88	2.02	> 100	> 100	65.89	> 100

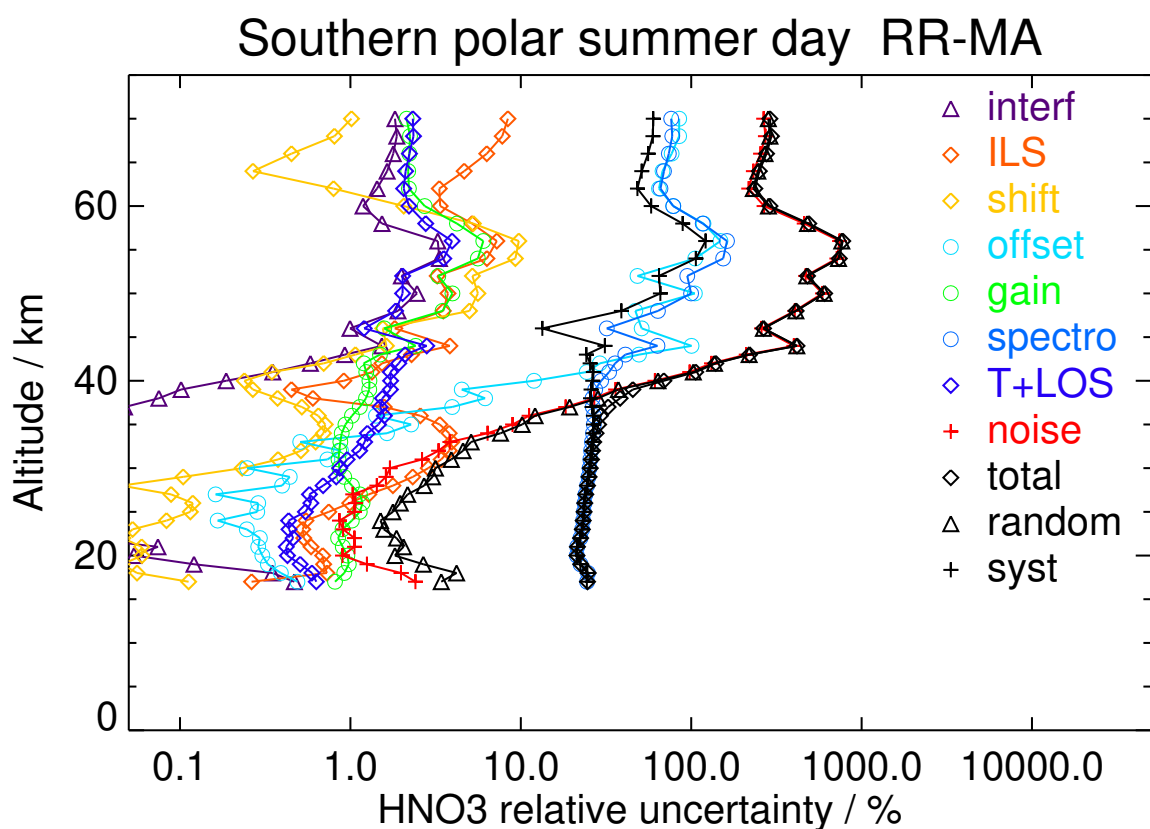


Figure S99: V8R_HNO₃_561 Southern polar summer day

Table S104: HNO₃ error budget for Southern polar summer night. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
17	4.23	0.47	0.41	0.12	0.52	0.84	25.15	0.70	2.52	4.85	24.85	25.32
20	6.49	0.04	0.76	0.06	0.30	0.88	21.84	0.48	0.92	2.25	21.78	21.90
23	8.77	0.03	0.68	0.07	0.26	0.86	22.79	0.50	0.97	1.49	22.80	22.84
26	8.39	< 0.01	1.19	0.08	0.30	1.14	23.83	0.67	1.19	1.71	23.87	23.93
29	6.22	< 0.01	2.27	0.16	0.45	1.02	24.93	0.88	1.78	2.30	25.03	25.14
32	3.38	0.02	3.49	0.52	0.92	1.05	26.17	1.23	3.79	4.38	26.38	26.74
35	1.45	0.04	3.23	0.55	2.27	1.11	26.80	1.46	10.20	10.94	26.86	29.01
38	0.56	0.09	1.28	0.32	5.99	1.23	27.26	1.57	30.66	32.18	26.25	41.53
41	0.17	0.38	0.96	0.23	25.12	1.34	32.08	1.98	> 100	> 100	26.79	> 100
44	0.06	1.20	3.82	0.60	86.31	2.01	64.02	2.53	> 100	> 100	30.87	> 100
46	0.01	10.93	33.68	18.46	> 100	26.20	> 100	18.70	> 100	> 100	> 100	> 100
50	-0.00	40.39	80.98	90.36	> 100	70.15	> 100	51.33	> 100	> 100	> 100	> 100

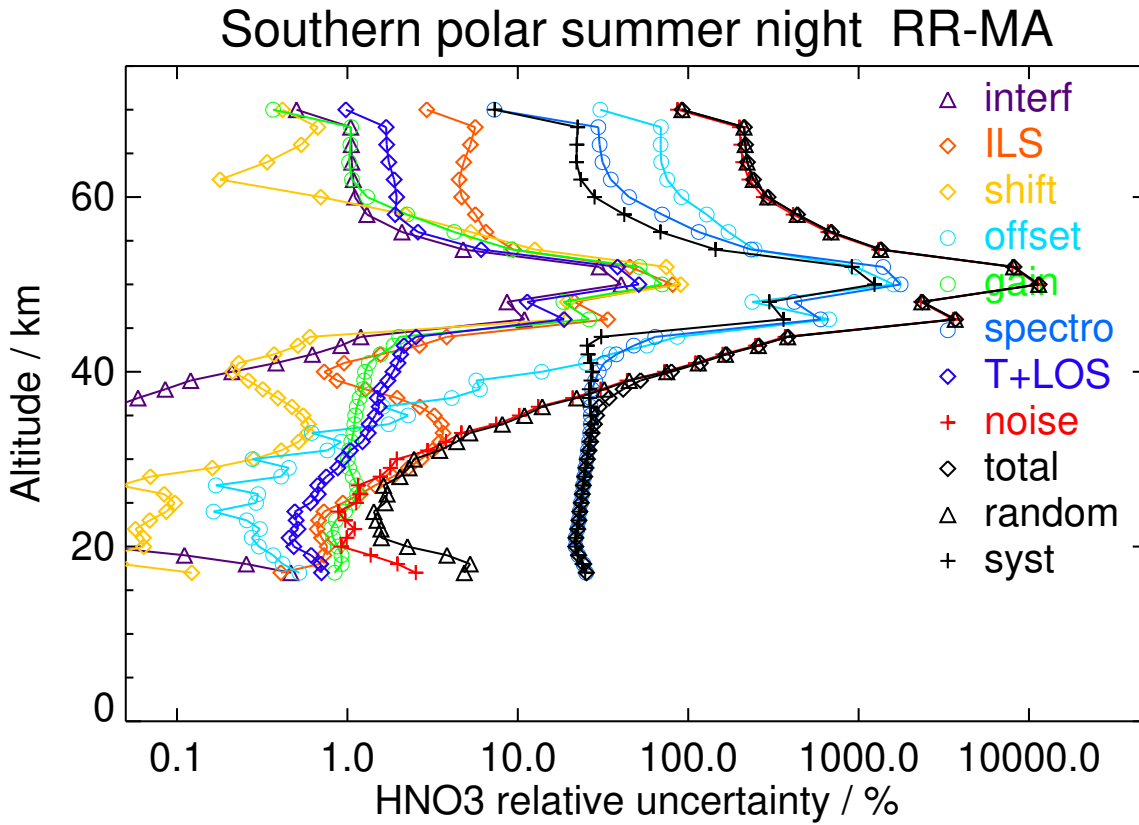


Figure S100: V8R_HNO₃_561 Southern polar summer night

Table S105: HNO₃ error budget for Southern polar autumn day. All uncertainties are 1 σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
20	9.39	0.05	0.84	0.06	0.33	0.85	22.46	0.62	0.92	3.31	22.28	22.52
23	12.17	0.02	1.04	0.09	0.26	0.73	22.77	0.67	1.07	2.58	22.70	22.85
26	10.79	< 0.01	1.62	0.07	0.29	1.11	24.44	0.95	1.34	2.70	24.43	24.58
29	7.13	0.01	2.33	0.21	0.50	1.21	25.91	1.25	2.22	3.17	25.98	26.18
32	3.52	0.02	2.83	0.30	1.04	1.22	27.80	1.58	5.02	6.65	27.69	28.48
35	1.31	0.04	3.50	0.21	2.60	1.23	30.38	2.01	15.21	17.32	29.64	34.33
38	0.28	0.15	5.00	0.23	12.60	1.38	41.23	3.62	78.76	81.88	37.39	90.01
41	0.02	3.15	15.69	3.86	> 100	6.50	> 100	21.59	> 100	> 100	61.57	> 100
44	0.03	2.53	17.68	3.84	> 100	4.86	> 100	13.68	> 100	> 100	23.28	> 100
46	0.06	1.31	6.05	3.11	> 100	2.09	87.97	5.37	> 100	> 100	38.55	> 100
50	-0.03	3.17	8.52	11.06	> 100	8.84	> 100	8.17	> 100	> 100	> 100	> 100

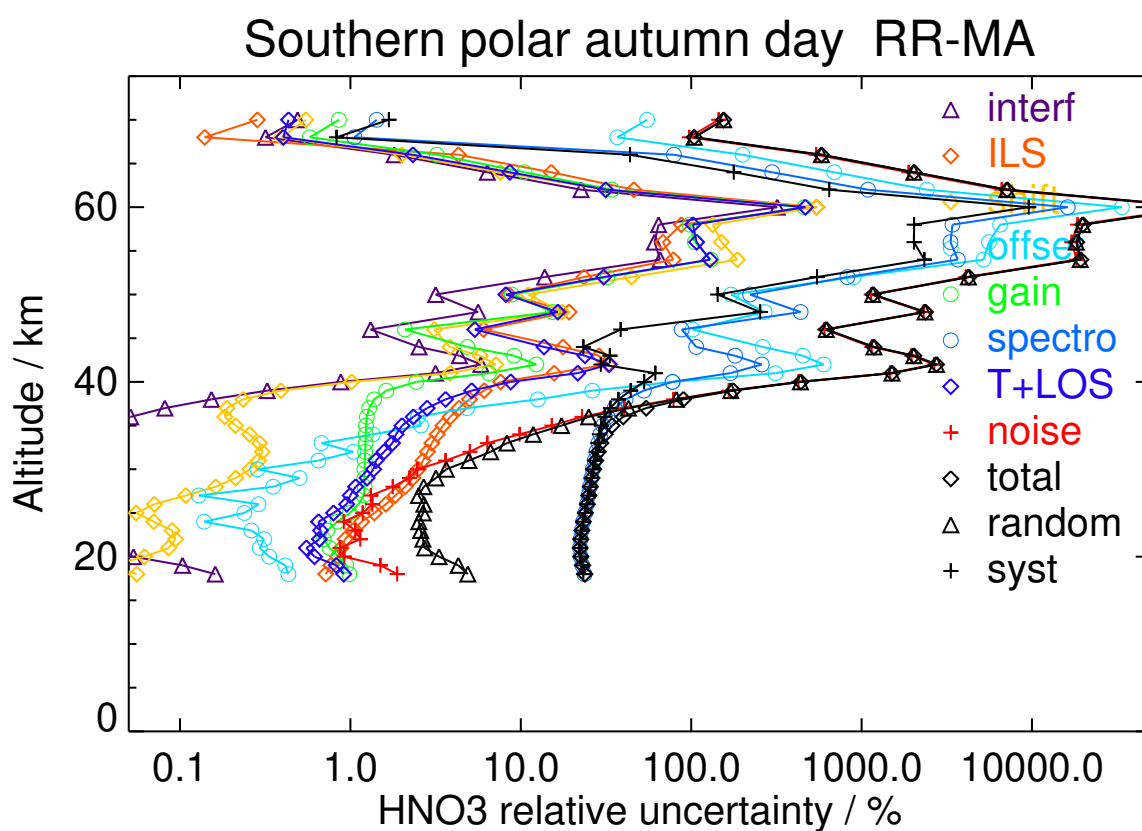


Figure S101: V8R_HNO₃_561 Southern polar autumn day

Table S106: HNO₃ error budget for Southern polar autumn night. All uncertainties are 1σ .

altitude (km)	mean target (ppbv)	interf (%)	ILS (%)	shift (%)	offset (%)	gain (%)	spectro (%)	T+LOS (%)	noise (%)	random (%)	syst (%)	total (%)
20	10.17	0.05	0.79	0.06	0.34	0.92	21.11	0.65	0.91	4.20	20.76	21.18
23	13.04	0.02	1.07	0.08	0.25	0.75	21.79	0.70	1.05	3.47	21.59	21.86
26	11.05	< 0.01	1.74	0.08	0.28	1.07	23.99	1.02	1.35	3.17	23.93	24.14
29	7.06	0.01	2.38	0.20	0.50	1.13	25.62	1.32	2.28	3.25	25.69	25.90
32	3.41	0.02	2.92	0.28	1.04	1.12	27.63	1.65	5.33	6.62	27.60	28.38
35	1.20	0.05	3.59	0.19	2.77	1.10	30.61	2.13	16.91	18.69	30.00	35.35
38	0.31	0.16	3.97	0.29	11.41	1.01	35.27	2.93	70.77	73.61	31.45	80.05
41	0.12	0.46	2.76	0.69	44.09	1.10	33.54	3.40	> 100	> 100	15.33	> 100
44	0.02	3.66	26.27	6.06	> 100	7.54	> 100	22.14	> 100	> 100	36.58	> 100
46	-0.04	1.66	7.94	3.88	> 100	2.33	> 100	6.90	> 100	> 100	36.64	> 100
50	-0.08	1.23	2.74	4.04	65.13	2.80	66.88	2.94	> 100	> 100	31.78	> 100

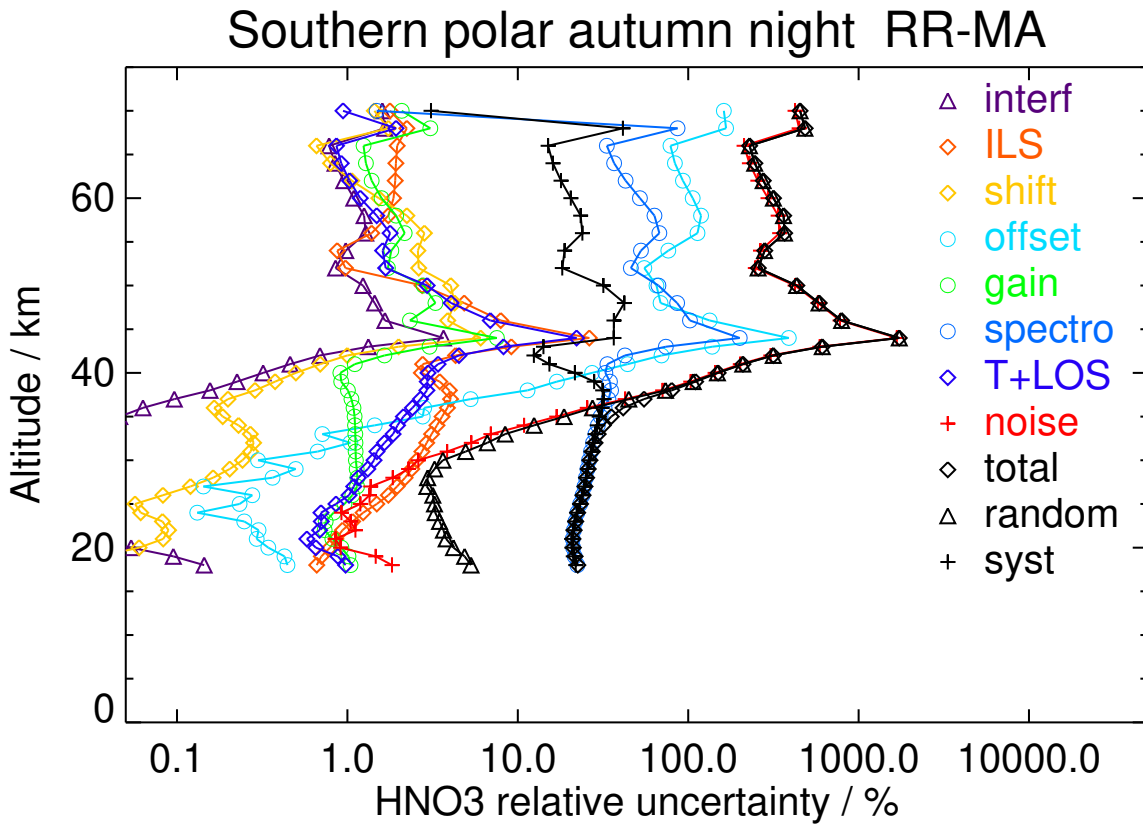


Figure S102: V8R_HNO₃_561 Southern polar autumn night

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