

Table 1. Retrieved gases, aerosol and temperature.

Emitter	A priori state	Altitude dependent dependent a priori standard deviation	Minimum a priori standard deviation	Uncertainty of spectroscopic data
CCl ₄	global ¹	midlat./tropical ¹	1%	2%
H ₂ O	midlat./tropical ¹	200 ppmV under, 2 ppmV over 17 km	50 %	5 %
HNO ₃	tropical ¹	800 pptV under 25 km tropical ¹ above	20 %	4.5 %
O ₃	ECMWF	300 ppbV	5 %	5 %
PAN	set to zero	100 % of approximated profile from (Glatthor et al., 2007)	100 %	4 %
Aerosol	HALOE ²	-	500 %	-
Temperature	ECMWF	-	5 K	-

¹Remedios et al. (2007b) ²HALogen Occultation Experiment (Hervig et al., 1993)

References

- Glatthor, T., et al.: "Global peroxyacetyl nitrate (PAN) retrieval in the upper troposphere from limb emission spectra of Michelson Interferometer for Passive Atmospheric Sounding (MIPAS)", *Atmos. Chem. Phys.*, 7, 2775–2787, 2007.
- Hervig, M. E., J. M. Russell III, L. L. Gordley, J. H. Park, and S. R. Drayson: "Observations of aerosol by the HALOE experiment onboard UARS: A preliminary Validation", *Geophys. Res. Lett.*, 20(12), 1291–1294, 1993
- Remedios, J. J., Leigh, R. J., Waterfall, A. M., Moore, D. P., Sembhi, H., Parkes, I., Greenhough, J., Chipperfield, M., Hauglustaine, D.: "MIPAS reference atmospheres and comparisons to V4.61/V4.62MIPAS level 2 geophysical data sets", *ACPD*, 7, 9973–10017, 2007.

Table 2. Forward model parameters.

Parameter	A priori state	Altitude dependent a priori standard deviation	Minimum a priori standard deviation	Uncertainty of spectroscopic data
C ₂ H ₆	midlat./tropical ¹	midlat./tropical ¹	5 %	10 %
ClONO ₂	tropical ¹	tropical ¹	5 %	3.5 %
CO ₂	modified global ¹	global ¹	5 %	5 %
CFC-11	HAGAR, midlat./tropical ¹	HAGAR, midlat./tropical ¹	5 %	3 %
CFC-113	modified global ¹	-	10 %	5 %
CFC-114	global ¹	-	5 %	5 %
CFC-12	HAGAR midlat./tropical ¹	HAGAR, midlat./tropical ¹	5 %	1 %
HCFC-22	ACE-FTS or global ¹	global ¹	5 %	4 %
HNO ₄	midlat./tropical ¹	midlat./tropical ¹	5 %	10 %
OCS	global ¹	global ¹	5 %	10 %
Pressure	ECMWF	-	1 %	-

Table 3. A priori radiance uncertainties.

ISB [cm^{-1}]	Forward Model standard deviation [%]	Offset [$\text{W}/\text{m}^2\text{sr cm}^{-1}$]	Gain [%]	Absolute noise [$\text{W}/\text{m}^2\text{sr cm}^{-1}$]	Relative noise [%]
777.8-778.7	0.70	0.0015	1	0.00005	1
784-785	0.82	0.0015	1	0.00005	1
787-790	0.51	0.0015	1	0.00005	1
791-793	0.35	0.0015	1	0.00005	1
794.1-795	0.45	0.0015	1	0.00005	1
796.6-797.5	0.42	0.0015	1	0.00005	1
832-832.9	0.25	0.0015	1	0.00005	1
844.3-847.3	0.21	0.0015	1	0.00005	1
863-864	0.18	0.0015	1	0.00005	1