

Supplement to:

Observed and simulated time evolution of HCl, ClONO₂,
and HF total column abundances

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by R. Kohlhepp et al.

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Table 1: Overview of the measurement specifications for HCl.

Measurement site	Spectral resolution [cm ⁻¹]	Spectral microwindows [cm ⁻¹]	Retrieved interfering species	Source of p/T profiles	Retrieval code	Spectroscopic database	Reference
Eureka DA8 (1997-2006)	0.004	2925.70-2926.10	NO ₂	radiosondes, NCEP, US Sub-Arctic Winter Model	SFIT1.09e	HITRAN 1992 plus updates	Fast et al. (2011)
Eureka 125HR (2006-2009)	0.0035	2775.72-2775.80 2821.40-2821.62 2925.75-2926.05	O ₃ , CH ₄ , N ₂ O; HDO, N ₂ O; CH ₄ , NO ₂ , OCS, O ₃	radiosondes, NCEP, US St. Atm.	SFIT2 v3.92C	HITRAN 2004 plus updates	Batchelor et al. (2009)
Ny Ålesund	0.005	2925.65-2926.25	CH ₄	NCEP	GFIT	updated ATMOS linelist from GFIT package, v2.6.4	Notholt et al. (1995b)
Thule	0.0035	2727.60-2727.95 2775.60-2775.95 2925.70-2926.10	O ₃ , CH ₄ , HDO	NCEP	SFIT2 v3.93	HITRAN 2004 plus updates to 2007	Hannigan et al. (2009)
Kiruna	0.005	2727.73-2727.82 2775.73-2775.79 2819.52-2819.61 2821.52-2821.62 2843.60-2843.65 2904.09-2904.14 2923.65-2923.78 2925.80-2926.00 2942.70-2942.75 2961.04-2961.09 2963.25-2963.32 2995.76-2995.79	H ₂ O, O ₃ , CH ₄	NCEP	PROFFIT	HITRAN 2004	Blumenstock et al. (2006)
Poker Flat	0.0035	2925.80-2926.00	H ₂ O, CH ₄ , NO ₂ , O ₃	radiosondes, UKMO, CIRA86	SFIT2 v3.7	HITRAN 2004	Kagawa et al. (2007)
Harestua		2925.60-2926.20 2925.75-2926.00	H ₂ O, CH ₄ , NO ₂ , HCl, O ₃	NCEP	SFIT2 v3.81	HITRAN 2004	
Zugspitze	0.005	2925.74-2926.06	CH ₄	Munich radiosonde	SFIT1.09e	HITRAN 1996	Sussmann and Schäfer (1997)
Jungfraujoch	0.003	2925.74-2926.06	CH ₄ , NO ₂	NCEP	SFIT1.09c	HITRAN 1992	Rinsland et al. (2003)
Toronto	0.004	2925.80-2926.00	CH ₄ , NO ₂ , O ₃	NCEP, US St. Atm.	SFIT2 v3.82B3	HITRAN 2004	Wiacek et al. (2007)
Tsukuba	0.0035	2925.69-2926.21	CH ₄ , H ₂ O	radiosondes at Tateno	SFIT1.09e	HITRAN 1996	Murata et al. (2005)
Izaña	0.0036	same as Kiruna	H ₂ O, O ₃ , CH ₄	local radiosondes	PROFFIT	HITRAN 2004	Schneider et al. (2005)
Mauna Loa	0.0035	2925.69-2926.50	CH ₄	radiosondes at Hilo	SFIT1	HITRAN 2000	Hannigan et al. (2009)
La Réunion and 0.00893	0.00513 and 0.00893	2925.70-2926.10	CH ₄	NCEP	SFIT2 v3.9	HITRAN 2004 plus updates for H ₂ O, N ₂ O, HNO ₃ , C ₂ H ₆	Senten et al. (2008)
Wollongong	0.0035	2925.80-2926.00	CH ₄	NCEP	GFIT	HITRAN 2004	Rinsland et al. (2003)
Lauder	0.0035	2925.75-2926.05	CH ₄ , NO ₂ , H ₂ O, O ₃	NCEP/NCAR	SFIT2 v3.82B3	HITRAN 2000	Rinsland et al. (2003)
Arrival Heights	0.0035	2925.75-2926.05	CH ₄ , NO ₂ , H ₂ O, O ₃	NCEP/NCAR	SFIT2 v3.82B3	HITRAN 2000	Mahieu et al. (2008)

Table 2: Overview of the measurement specifications for ClONO₂.

Measurement site	Spectral resolution [cm ⁻¹]	Spectral microwindows [cm ⁻¹]	Retrieved interfering species	Source of p/T profiles	Retrieval code	Spectroscopic database	Reference
Eureka DA8 (1997-2006)	0.004	779.550-781.100	O ₃ , H ₂ O, CO ₂ , C ₂ H ₂	radiosondes, NCEP, US Sub-Arctic Winter Model	SFIT1.09e	HITRAN 1992 plus updates	Fast et al. (2011)
Eureka 125HR (2006-2009)	0.0035	779.850-780.450 782.550-782.870 938.300-939.300	CO ₂ , O ₃ , HNO ₃ ; O ₃ , CO ₂ , H ₂ O, HNO ₃ ; CO ₂	radiosondes, NCEP, US St. Atm.	SFIT2 v3.92C	HITRAN 2004 plus updates	Batchelor et al. (2009)
Ny Ålesund	0.005	778.640-782.800	O ₃ , CO ₂ , H ₂ O, C ₂ H ₂	NCEP	GFIT	updated ATMOS-linelist from GFIT package, v2.6.4	Notholt et al. (1995b)
Thule	0.01	780.120-780.320 780.700-781.250	O ₃ , CO ₂	NCEP	SFIT2 v3.93	HITRAN 2004 plus updates to 2007	Hannigan et al. (2009)
Kiruna	0.005	779.000-779.800 780.000-780.300 780.300-781.300	H ₂ O, CO ₂ , O ₃ , HNO ₃ , C ₂ H ₂	NCEP	PROFFIT	HITRAN 2004	Blumenstock et al. (2006)
Harestua		779.500-780.700 779.905-780.340	CO ₂ , H ₂ O, O ₃ , ClONO ₂ , HNO ₃	NCEP	SFIT2 v3.81	HITRAN 2004	
Zugspitze	0.0036	779.300-780.600 780.050-780.355	H ₂ O, O ₃ , CO ₂	Munich radiosonde	SFIT2 v3.8	HITRAN 1996 with Birk parameters for ClONO ₂	Sussmann and Schäfer (1997)
Jungfraujoch	0.005	779.300-780.600 780.050-780.355	Wide: H ₂ O, O ₃ , CO ₂ ; Narrow: O ₃ , HNO ₃ , COF ₂	NCEP	SFIT2 v3.81	HITRAN 1996 including Birk and Wagner line parameters	Rinsland et al. (2003)
Izaña	0.0036	779.000-779.800 780.000-780.300 780.300-781.300	H ₂ O, CO ₂ , O ₃ , HNO ₃ , C ₂ H ₂	local radiosondes	PROFFIT	HITRAN 2004	Schneider et al. (2005)
Wollongong	0.0035	779.300-780.600 780.050-780.355	Wide: O ₃ , H ₂ O, CO ₂ , C ₂ H ₂ ; Narrow: none	NCEP	SFIT2 v3.92	HITRAN 2004	Rinsland et al. (2003)
Lauder	0.0035	779.300-780.600 780.050-780.355	Wide: O ₃ , H ₂ O, CO ₂ , C ₂ H ₂ ; Narrow: none	NCEP/NCAR	SFIT2 v3.82B3	HITRAN 2000	Rinsland et al. (2003)
Arrival Heights	0.0035	779.300-780.600 780.050-780.355	Wide: O ₃ , H ₂ O, CO ₂ , C ₂ H ₂ ; Narrow: none	NCEP/NCAR	SFIT2 v3.82B3	HITRAN 2000	Rinsland et al. (2003)

Table 3: Overview of the measurement specifications for HF.

Measurement site	Spectral resolution [cm ⁻¹]	Spectral microwindows [cm ⁻¹]	Retrieved interfering species	Source of p/T profiles	Retrieval code	Spectroscopic database	Reference
Eureka DA8 (1997-2006)	0.004	4038.780-4039.100	H ₂ O	radiosondes, NCEP, US Sub-Arctic Winter Model	SFIT1.09e	HITRAN 1992 plus updates	Fast et al. (2011)
Eureka 125HR (2006-2009)	0.0035	4038.780-4039.100	H ₂ O, HDO, CH ₄	radiosondes, NCEP, US St. Atm.	SFIT2 v3.92C	HITRAN 2004 plus updates	Batchelor et al. (2009)
Ny Ålesund	0.005	4038.600-4039.240	H ₂ O	NCEP	GFIT	updated ATMOS-linelist from GFIT package, v2.6.4	Notholt et al. (1995a)
Thule	0.0035	4000.800-4001.200 4038.750-4039.200	H ₂ O, CH ₄ , HDO	NCEP	SFIT2 v3.93	HITRAN 2004 plus updates to 2007	Hannigan et al. (2009)
Kiruna	0.0075	4000.900-4001.050 4038.850-4039.080	H ₂ O	NCEP	PROFFIT	HITRAN 2004	Blumenstock et al. (2006)
Poker Flat	0.0035	4038.804-4039.148	H ₂ O	radiosondes, UKMO, CIRA86	SFIT2 v3.7	HITRAN 2004	Kagawa et al. (2007)
Harestua		4038.100-4039.500 4038.860-4039.050	H ₂ O, HDO, CH ₄ , HF	NCEP	SFIT2 v3.81	HITRAN 2004	
Zugspitze	0.0078	4038.800-4039.100	H ₂ O column	Munich Radiosonde	SFIT1.09e	HITRAN 1996	Sussmann and Schäfer (1997)
Jungfraujoch	0.004	4038.800-4039.105	CH ₄ , NO ₂	NCEP	SFIT1.09c	HITRAN 1992	Zander et al. (2008)
Toronto	0.004	4038.770-4039.130	H ₂ O, HDO, CH ₄	NCEP, US St. Atm.	SFIT2 v3.82B3	HITRAN 2004	Wiacek et al. (2007)
Tsukuba	0.0035	4038.800-4039.100	H ₂ O, HDO, CH ₄	radiosonde	SFIT1.09e	HITRAN 1996	Murata et al. (2005)
Izaña	0.0036	4000.900-4001.050 4038.850-4039.080	H ₂ O	local radiosondes	PROFFIT	HITRAN 2004	Schneider et al. (2005)
Mauna Loa	0.0035	4038.850-4039.050	H ₂ O	radiosondes at Hilo	SFIT1	HITRAN 2000	Hannigan et al. (2009)
La Réunion	0.0072	4038.700-4039.050	H ₂ O	NCEP	SFIT2 v3.9	HITRAN 2004 updates for H ₂ O, N ₂ O, HNO ₃ , C ₂ H ₆	Senten et al. (2008)
Wollongong	0.0035	4038.810-4039.090	H ₂ O	NCEP	GFIT	HITRAN 2004	Mahieu et al. (2008)
Lauder	0.0035	4038.780-4039.0995	H ₂ O, HDO, CH ₄	NCEP/NCAR	SFIT2 v3.82B3	HITRAN 2000	Reisinger et al. (1994)
Arrival Heights	0.0035	4038.780-4039.100	H ₂ O, HDO, CH ₄	NCEP/NCAR	SFIT2 v3.82B3	HITRAN 2000	Reisinger et al. (1994)