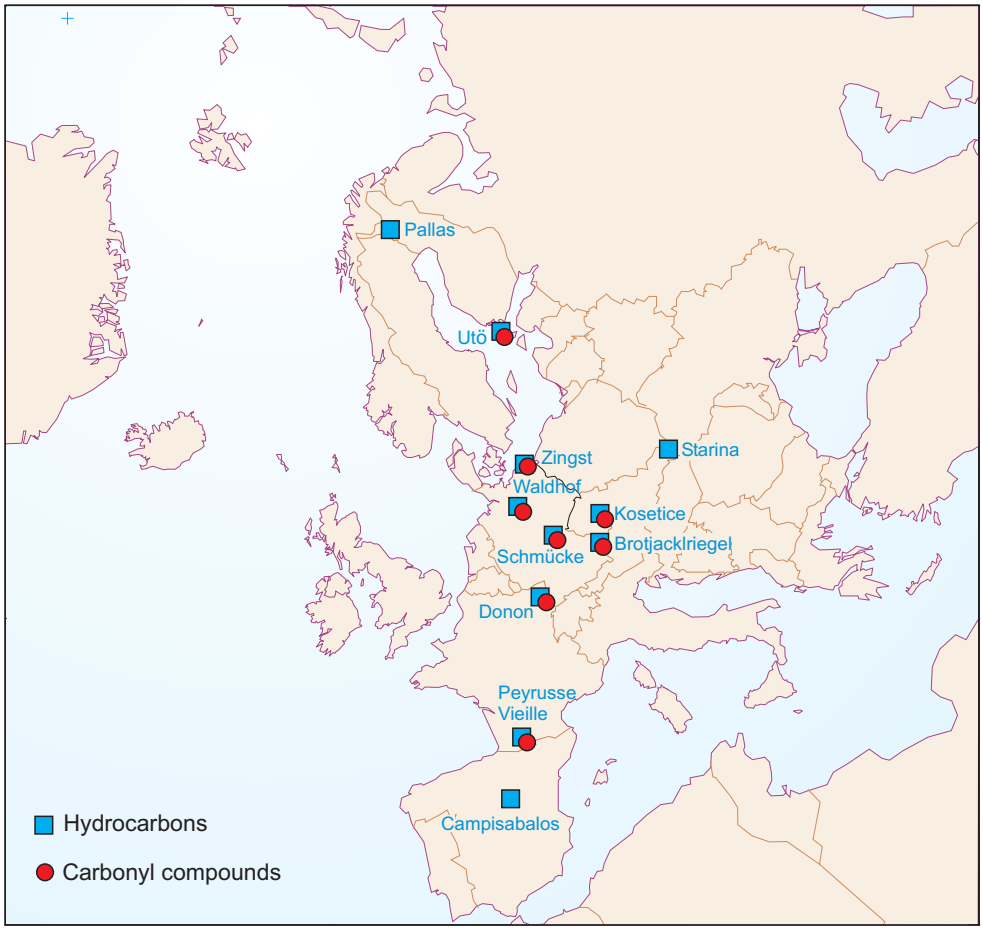
EMEP/CCC-Report 2/2003

EMEP Co-operative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe

VOC measurements 2001

Sverre Solberg



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Summary

This report presents measurements of VOC carried out during 2001 at EMEP monitoring sites. VOC measurements are reported for a total of 13 sites and 8 of these with carbonyls. The first hydrocarbon measurements reported from ES09, Campisábalos, Spain, are included in the report. Furthermore, the continuous hydrocarbon monitor previously at Tänikon, Switzerland, was moved to the more remote site at CH05, Rigi, in July 2001 and the measurement data are presented in this report. With exception of the Swiss data, all the VOC measurements are made by grab samples of light hydrocarbons in canisters and 8-h samples of carbonyls by DNPH adsorption tubes.

EMEP/CCC's laboratory at NILU carried out the chemical analyses of carbonyls for the samples from Finland (Utö) and the Czech Republic (Košetice), while the other carbonyl samples (from Germany and France) were analysed by the national laboratories. Parallel sampling and analyses of carbonyls were continued at DE02 Waldhof. The results show a fair agreement between the parallel data series, although a systematic bias was found with UBA's formaldehyde data being higher than NILU's data.

For the light hydrocarbons the national laboratories in their respective countries carried out their own chemical analyses. No parallel sampling of hydrocarbons were carried out in 2001.

The general concentration level in 2001 was similar to the previous year. However, a detailed trend study is required to detect any long term changes in the concentration level. In general the measurements indicate that hydrocarbons become fairly well mixed in Europe in winter. Components indicative of natural gas emissions, ethane and propane, were high in north and east, whereas ethene, propene and acetylene were higher in central parts of the continent. N- and i-butane that stem from a number of different emission sources also showed high concentrations to the north.

VOC measurements 2001

1. Introduction

The Geneva Protocol concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes was adopted in November 1991. It entered into force on 29 September 1997. Three options for emission reduction targets are specified by the Protocol:

(i) 30% reduction in emissions of VOC by 1999 using a year between 1984 and 1990 as a basis;
(ii) The same reduction as for (i) within a Tropospheric Ozone Management Area (TOMA) and ensuring that by 1999 total national emissions do not exceed 1988 levels;
(iii) Finally, where emissions in 1988 did not exceed certain specified levels, Parties may opt for a stabilization at that level of emission by 1999.

In 1999 the so-called Gothenburg protocol, the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, was adopted by the Executive Body of UN-ECE. The Protocol sets emission ceilings for 2010 for four pollutants: sulphur, NO_x, VOCs and ammonia. These ceilings were negotiated on the basis of scientific assessments of pollution effects and abatement options. Parties whose emissions have a more severe environmental or health impact and whose emissions are relatively cheap to reduce will have to make the biggest cuts. Once the Protocol is fully implemented, Europe's sulphur emissions should be cut by at least 63%, its NO_x emissions by 41%, its VOC emissions by 40% and its ammonia emissions by 17% compared to 1990. The Protocol also sets tight limit values for specific emission sources (e.g. combustion plant, electricity production, dry cleaning, cars and lorries) and requires best available techniques to be used to keep emissions down. VOC emissions from such products as paints or aerosols will also have to be cut.

The EMEP VOC monitoring programme was initiated at the EMEP Workshop on Measurements of Hydrocarbons/VOC in Lindau, 1989 (EMEP/CCC, 1990). A three-fold objective of the measurement programme was defined at the workshop:

- Establishing the current ambient concentrations
- Compliance monitoring ("Do the emission control programme lead to a reduction of atmospheric concentrations?")
- Support to the transboundary oxidant modelling (prognostic and diagnostic)

The Workshop recommended that as a first step it would be sufficient with VOC monitoring at 10-15 rural sampling sites and taking two samples per week at each station centred at 12 noon GMT. Collection in stainless steel canisters and analyses by high resolution gas chromatography was recommended for the detection of light hydrocarbons, whereas impregnated adsorbent tubes sampling combined with high performance liquid chromatography (HPLC) was

recommended for the detection of carbonyls. A list of required and desirable compounds was defined and is shown in Table 1.

Certain additional remarks at the Workshop were underlined in the proceedings report (EMEP/CCC, 1990). The need for more information on VOC concentrations close to the emission sources for modelling purposes was raised. Harmonisation with national urban measurement programmes was recommended as well as the assembling of VOC emission inventories. Furthermore, the importance of concurrent measurements of oxides of nitrogen was strongly emphasised.

At the Lindau Workshop it was also recommended that during the starting period the analyses of the VOC samples should be made by the CCC and that other laboratories should be included later on.

Table 1: List of volatile organic compounds that are "required" or "desirable" to measure within the EMEP programme as defined at the EMEP Workshop in Lindau, 1989 (EMEP/CCC, 1990).

	required	**desirable**
Alkanes	ethane	hexane
	propane	branched hexanes
	i-butane	heptane
	n-butane	branched heptanes
	i-pentane	octane
	n-pentane	
Alkenes	ethene	butenes
	propene	pentenes
	isoprene	
Alkynes	acetylene	
Aromatics	benzene	styrene
	toluene	propylbenzenes
	o-xylene	ethyltoluenes
	m,p-xylene	
	ethylbenzene	
	trimethylbenzenes	
Aldehydes	formaldehyde	propionaldehyde
	acetaldehyde	
Ketones	acetone	methylethylketone
		methylvinylketone

The measurements of VOC within EMEP started with the collection of grab samples of light hydrocarbons in the middle of 1992, whereas measurements of carbonyls started in 1993. In the beginning five stations were included in the monitoring programme, Rucava (LV10), Košetice (CZ03), Waldhof (Langenbrügge) (DE02), Tänikon (CH32) and Donon (FR08). Since then the number and selection of VOC measurement sites have changed several times.

The first laboratory intercomparison of light hydrocarbons in EMEP was organised already in 1993 (Romero, 1995). The variation or relative deviation among the laboratories was in a range ±25% from the median. The exercise

showed that the majority of the participating laboratories had the required analytical technique to correctly analyse a wide range of NMHC within an accuracy of ±10–15%. Furthermore, the results showed no substantial differences whether the air samples were analysed immediately after collection or after a period up to 2 months (for C_2–C_5 hydrocarbons).

The measurements are reported annually, and officially made public by the Steering Body of EMEP. Previous results from the EMEP VOC programme have been presented in annual reports (e.g. Solberg et al., 2002). An EMEP expert meeting on VOC measurements was organised in Berlin, 1994 (EMEP/CCC, 1995), and an evaluation of the measurement programme was made in 1995 (Solberg et al., 1995). Highlights and findings from the EMEP VOC programme have also been presented in a number of scientific papers (Lindskog et al., 1995; Solberg et al., 1996; Hov et al., 1997; Solberg et al., 2001).

2. Status of the measurement programme in 2001

2.1 Status of station network

The location of the monitoring sites for VOC presented in this report is shown in Figure 1. An overview of the EMEP VOC measurement programme and the accompanying measurements presented in this report are given in Table 2. As indicated by Table 2, data for 13 measurement sites for VOC have been reported to CCC and 8 of these with carbonyls.

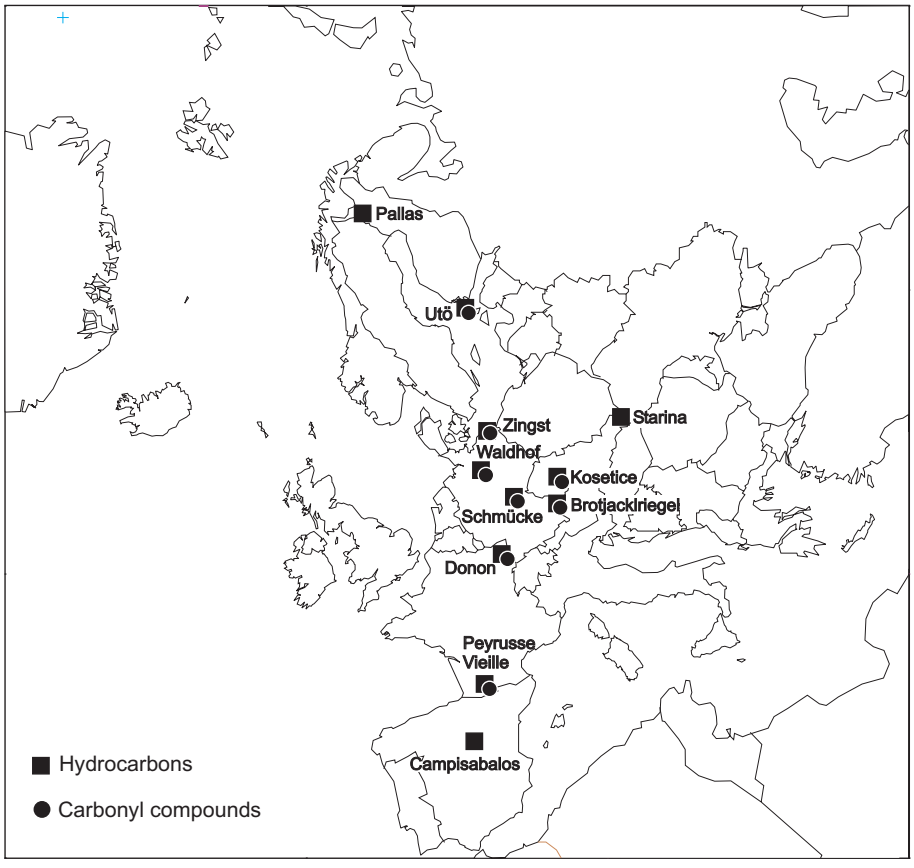


Figure 1: Monitoring sites for VOC in 2001.

The measurements of VOC at Campisábalos (ES09) started at the end of 1999. This is a rural station without anthropogenic emissions in the vicinity located in an area with coniferous forest. Recently, the whole surrounding area has been undertaking a complete reforestation plan of pine tree wood and oak.

Table 2: Status of the VOC monitoring programme in 2001. The columns give the station names, site code, and the sampling frequencies for hydrocarbons (HC) and carbonyl compounds (Carb). The laboratory responsible for the chemical analyses is also given. Additional laboratories taking part in parallel measurements are indicated in parenthesis.

Station	Code	HC[1)]	Lab.[2)]	Carb[1)]	Lab.[2)]	Comments
Pallas	FI96	Reg.	FMI	n.m.	-	
Utö	FI09	Reg.	FMI	Reg.	NILU	
Birkenes	NO01	n.m.	-	Reg.	NILU	HC sampling ended
Waldhof	DE02	Reg.	UBA	Reg.	UBA (NILU)	Parallel sampling of carbonyls
Schmücke	DE08	Reg.	UBA	Reg.	UBA	
Zingst	DE09	Reg.	UBA	Reg.	UBA	
Brotjacklriegel	DE05	Reg.	UBA	Reg.	UBA	
Košetice	CZ03	Reg.	CHMI	Reg.	NILU	
Starina	SK06	Reg.	SHMI	n.m.	-	Missing periods
Rigi	CH05	Cont.	EMPA	n.m.	-	Monitor moved from Tänikon in July 2001
Donon	FR08	Reg.	EMD	Reg.	EMD	
Peyrusse Vieille	FR13	Reg.	EMD	-	-	No carbonyl data used due to station renovation
Campisabalos	ES09	Reg.	MMA	n.m.	-	New VOC site in EMEP

1) Reg. = regularly, Scat. = scattered, n.m. = not measured., cont. = Continuous
2) CHMI = Czech Hydrometeorological Institute
EMD = Ecole des Mines de Douai (France)
EMPA = Swiss Federal Lab. for Materials Testing and Research
FMI = Finnish Meteorological Institute
MMA = Ministerio de Medio Ambiente (Spain)
NILU = Norwegian Institute for Air Research
SHMI = Hydrometeorological Institute in Slovakia
UBA = Umweltbundesamt (Germany)

Table 3 gives the number of valid samples of hydrocarbons and carbonyls (after inspection and removal of outliers). According to EMEP's recommendations, the samples should be taken twice a week, implying that 104 samples per year correspond to 100% data cover.

A 90% data completeness, i.e. 94 samples pr year, of daily values is given as data quality objective according to the EMEP manual (EMEP/CCC, 1996) and that is fulfilled at most of the VOC sites. The data capture was particularly low at Starina and also at Peyrusse Vieille due to station renovation.

Table 3: The number of samples of hydrocarbons (HC) and carbonyls (Carb) in 2001.

Station	Number of samples	
	HC	Carb
Pallas	93	-
Utö	98	99
Birkenes	-	86
Zingst	104	104
Waldhof	101	104
Schmücke	94	104
Brotjacklriegel	103	104
Košetice	105	96
Starina	47	-
Donon	94	97
Peyrusse Vieille	74	-
Campisábalos	103	-

2.2 Analytical procedures and quality control

The procedures for sampling and chemical analyses were similar in 2001 as in previous years, and are not discussed in this report. A detailed description of the procedures used by NILU is given in the EMEP manual (EMEP/CCC, 1996). The technical procedures for the sampling and analysis of hydrocarbons by FMI at the two Finnish stations, as well as a site description and data interpretation, are given by Laurila and Hakola (1996). A presentation of the sampling and analyses performed by the laboratories at EMD (France), CHMI (Czech Republic), SHMI (Slovakia) and UBA (Germany) has been given in previous annual reports and is not repeated here.

Measurements at ES09, Campisábalos, are done twice a week in electropolished stainless steel canisters at midday. The canisters have a volume of about 1.5 l, but, as it is vacuum-packed, it is flushed with a total volume of 4.5 l. The sampling takes about 5 minutes. Then, the canister is sent to the laboratory and there it is analysed by high resolution gas chromatography detected by flame ionisation. Recently (in 2003) sampling and measurements of aldehydes and ketones have also started at the site.

For the EMEP VOC measurements in general, the quality control of the VOC measurements includes QA procedures at all stages from sampling to chemical analyses and integration. The QA procedures are described in the EMEP manual (EMEP/CCC, 1996) and are the laboratories' responsibility to follow up. In addition, data received from the individual laboratories are inspected before classified as valid or invalid by the EMEP/CCC.

A few notes about the measurements are given in the following. The concentrations of 3-buten-2-one, 2-methylpropenal, 2-butanone and butanal have for many years been difficult to interpret. No systematic and explainable pattern has been found and inter-laboratory comparisons between EMD, UBA and NILU have indicated analytical problems. Laboratory studies at CCC indicate that unsaturated carbonyl compounds are not chemical stable in the prepared sample

solution. Furthermore, LC/MS studies indicate possibilities of chromatographic interference in the C_4 carbonyl compound range. Thus, a revision of the monitoring procedures for carbonyls is needed.

For the two Finnish sites, hexane data from the beginning of 2001 and also some 2- and 3-methylpentane data are missing due to analytical problems. An impurity in the column coeluted with hexane and could not be removed until a new column was applied.

At Starina the data capture is low, partly due to missing data for the three last months of the year. This was due to a failure of the thermodesorber.

3. Results from parallel analysis

3.1 Parallel analysis of carbonyl compounds at Waldhof by NILU and UBA

Figure 2 shows the results of the parallel analysis of methanal, ethanal and propanone (formaldehyde, acetaldehyde and acetone) at DE02 Waldhof (Langenbrügge) by NILU's and UBA's laboratories. A statistical summary of the parallel analysis is given in Table 4. The statistical parameters include the medians of the data from NILU and UBA and the median differences as well as the modified median absolute difference estimator, M.MAD, as described in the EMEP manual (EMEP/CCC, 1996) and the coefficient of variation, CoV, defined as CoV=(M.MAD)/(NILU's median). The analyses from the laboratory at NILU were regarded the reference in these calculations.

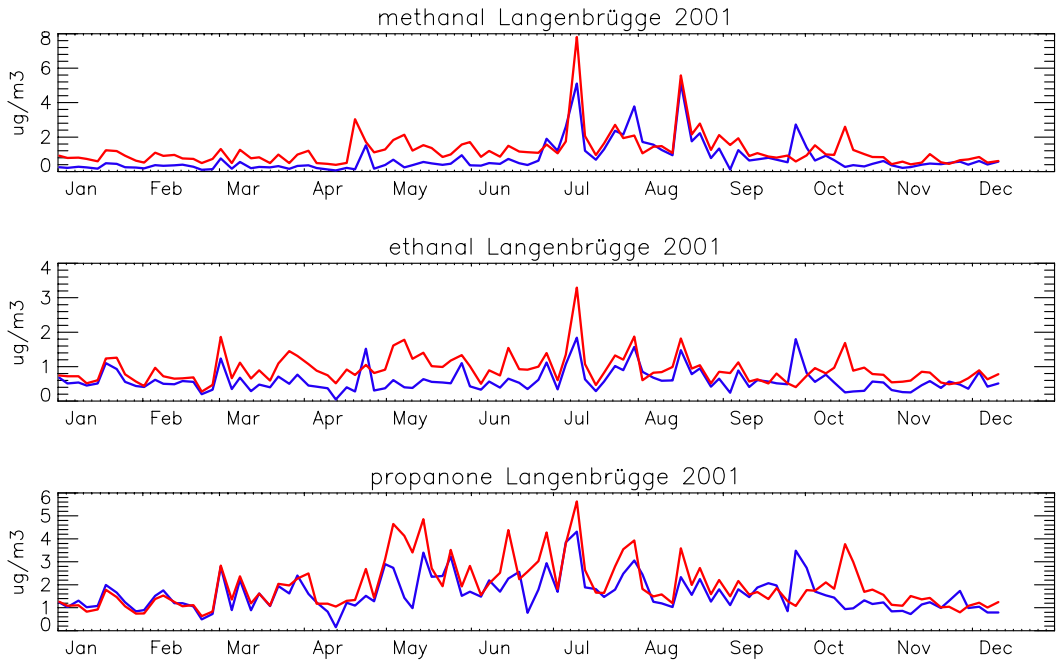


Figure 2: Results of parallel sampling and analyses of carbonyl compounds at Waldhof by NILU (blue line) and UBA (red line) in 2001.

Table 4: Results from parallel sampling and analyses of carbonyl compounds at DE02, Waldhof during 2001. The columns give the median of all samples as analysed by NILU and UBA, respectively, as well as the median difference and the modified median absolute difference estimator (M.MAD) and the coefficient of variation (CoV). A few outliers were removed from this analysis. Unit: $\mu g/m^3$.

	median NILU	median UBA	median difference	M.MAD	CoV
methanal	0.440	0.991	0.444	0.338	0.768
ethanal	0.540	0.829	0.280	0.209	0.387
propanone	1.470	1.644	0.215	0.397	0.270

M.MAD expresses the spread of the data and equals the standard deviation if the population has a normal distribution. CoV expresses the relative spread of the data, and, similar to the M.MAD, approaches the relative standard deviation for a normal distributed population. Both parameters are non-parametric statistics that make them particularly useful for trace gas measurements that normally show a non-normal distribution in the data.

As indicated by Figure 2, there is an overall fair agreement between the two laboratories' data although UBA's values are systematically higher for all three components (Table 4). This difference is particularly pronounced for methanal.

4. VOC concentrations in 2001

4.1 Regional distribution of hydrocarbons

Monthly mean and median concentrations of the individual hydrocarbons and carbonyls for 2001 are tabulated in Appendix A. The monthly statistics were not calculated if the number of samples were below four. Time series of all compounds during 2001 are given in Appendix B. Note that daily average concentrations are shown for the monitor data from CH05 Rigi.

In general, the concentrations of the light hydrocarbons were in the same range as in 2000. The monthly values for Starina in 2001 are very high for several of the compounds and months. Compared with the other sites the representativity of these data could be questioned given the low data capture at the station. The monthly values at Campisábalos are generally low which may reflect that the station frequently receives clean, Atlantic air masses. Exercises with parallel sampling of VOC is, however, recommended at this new site to evaluate any possible systematic differences due to sampling or analytical procedures.

Figure 3–Figure 12 shows maps with the stations' median concentrations of 10 light hydrocarbons for the winter months January, February, November and December in 2001 taken together. Although the number of sites obviously is too low to give a clear picture of the regional background distribution of hydrocarbons in Europe, some characteristics are indicated by these results. Note, however, that data from CH05, Rigi, are only from the last half year. Furthermore, there are no ethane data from ES09, Campisábalos, in January. The results from SK06, Starina, were not included due to the low data capture. Similar figures for three carbonyls for the summer months May-August 2001 are given in Figure 13–Figure 15.

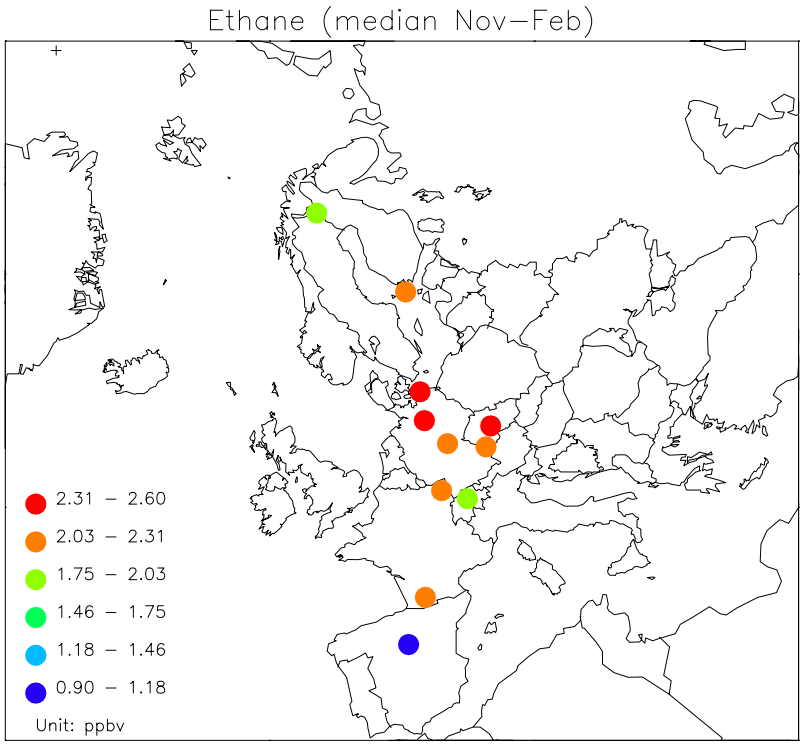


Figure 3: Median concentration of ethane at EMEP sites in the winter months November, December, January and February 2001 taken together.

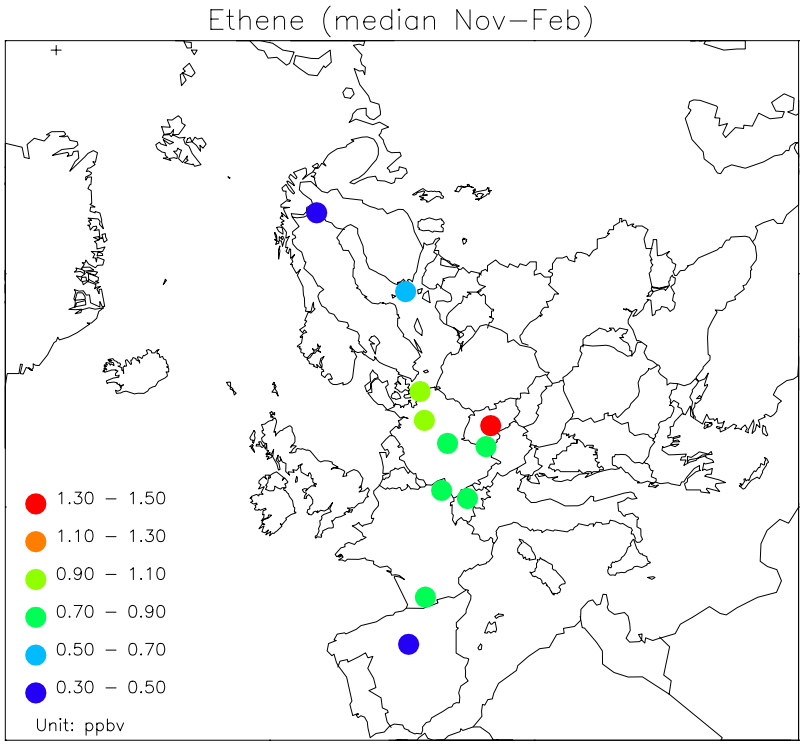


Figure 4: Median concentration of ethene at EMEP sites in the winter months November, December, January and February 2001 taken together.

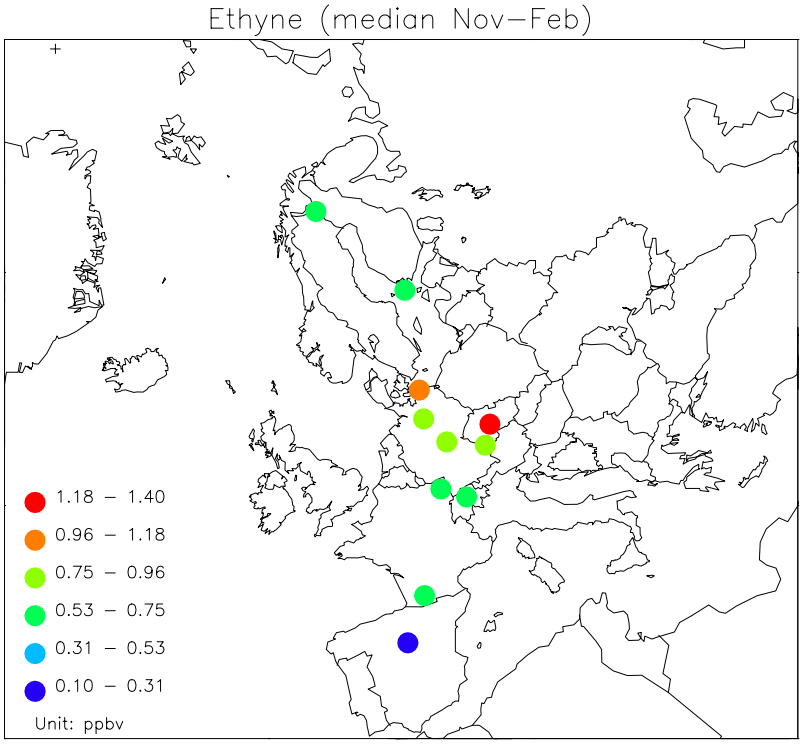


Figure 5: Median concentration of acetylene at EMEP sites in the winter months November, December, January and February 2001 taken together.

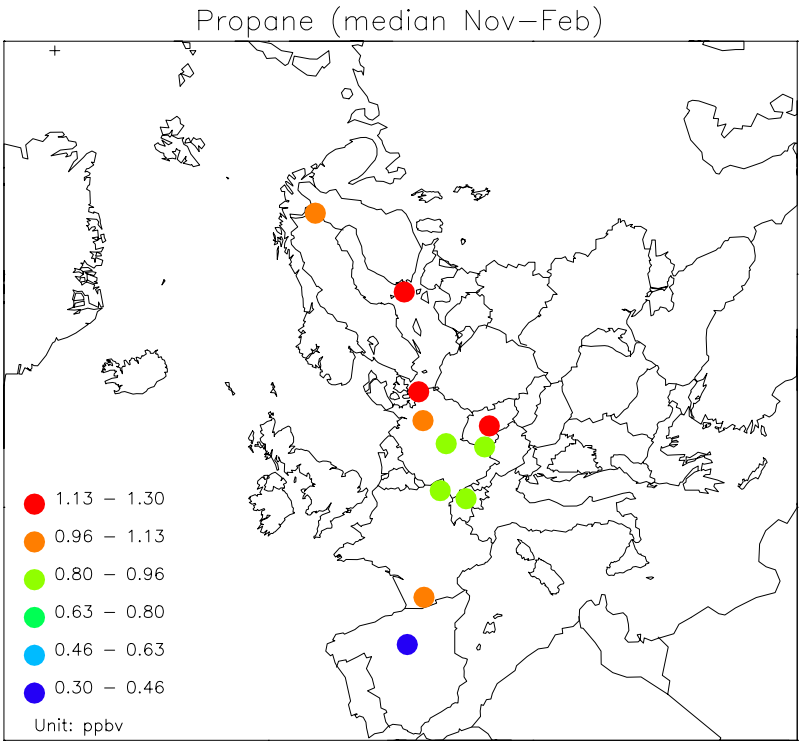


Figure 6: Median concentration of propane at EMEP sites in the winter months November, December, January and February 2001 taken together.

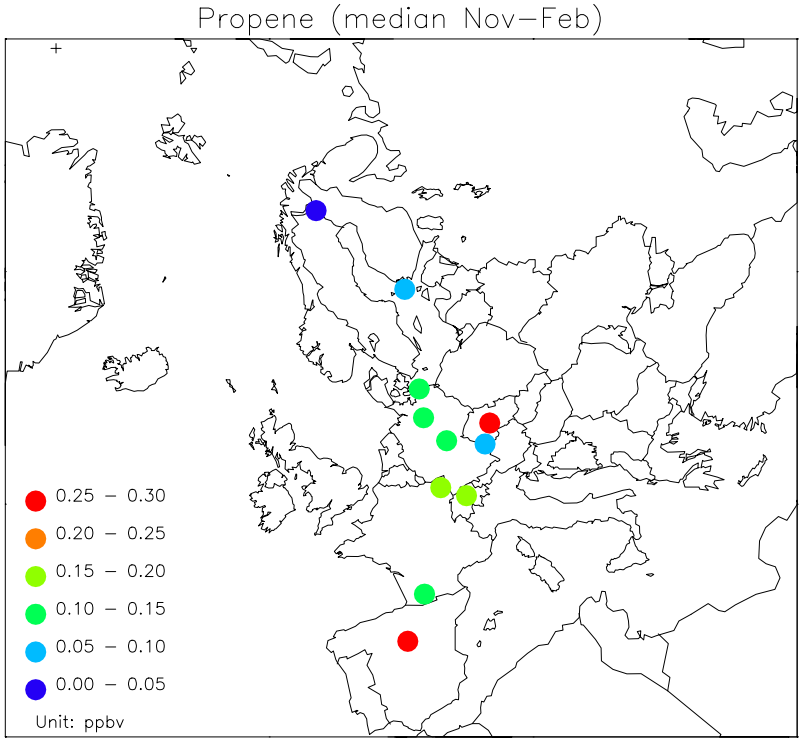


Figure 7: Median concentration of propene at EMEP sites in the winter months November, December, January and February 2001 taken together.

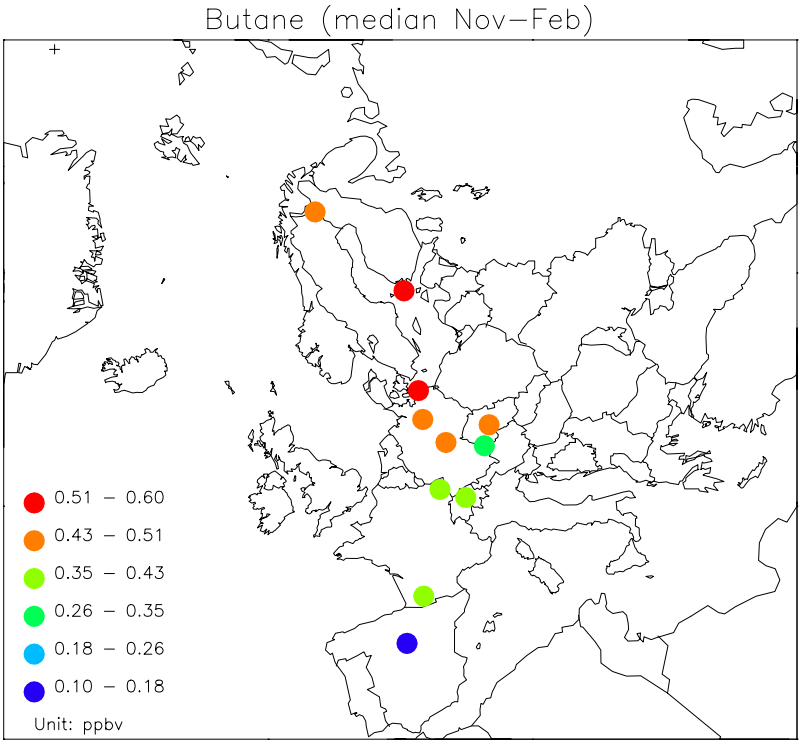


Figure 8: Median concentration of n-butane at EMEP sites in the winter months November, December, January and February 2001 taken together.

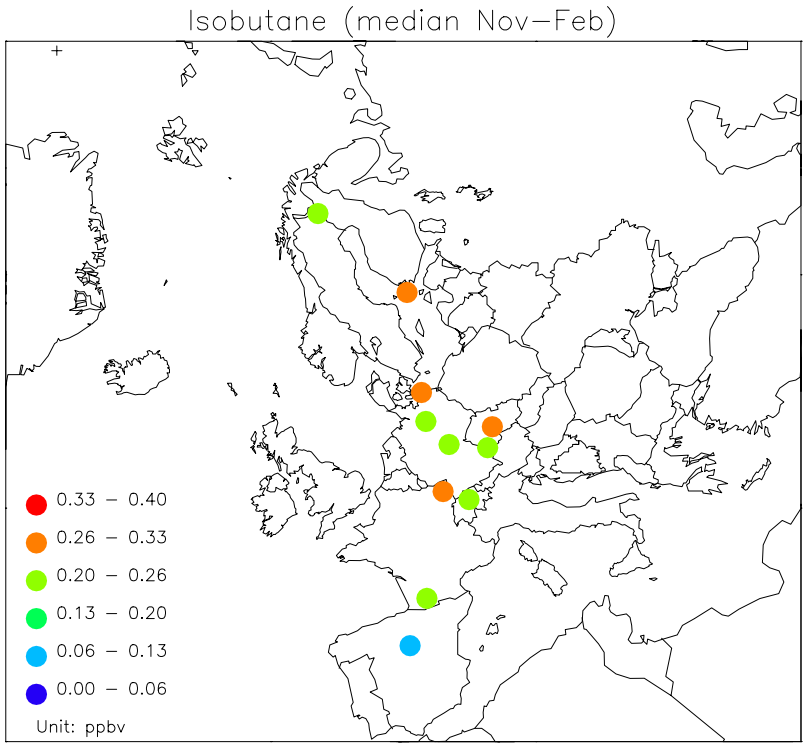


Figure 9: Median concentration of i-butane at EMEP sites in the winter months November, December, January and February 2001 taken together.

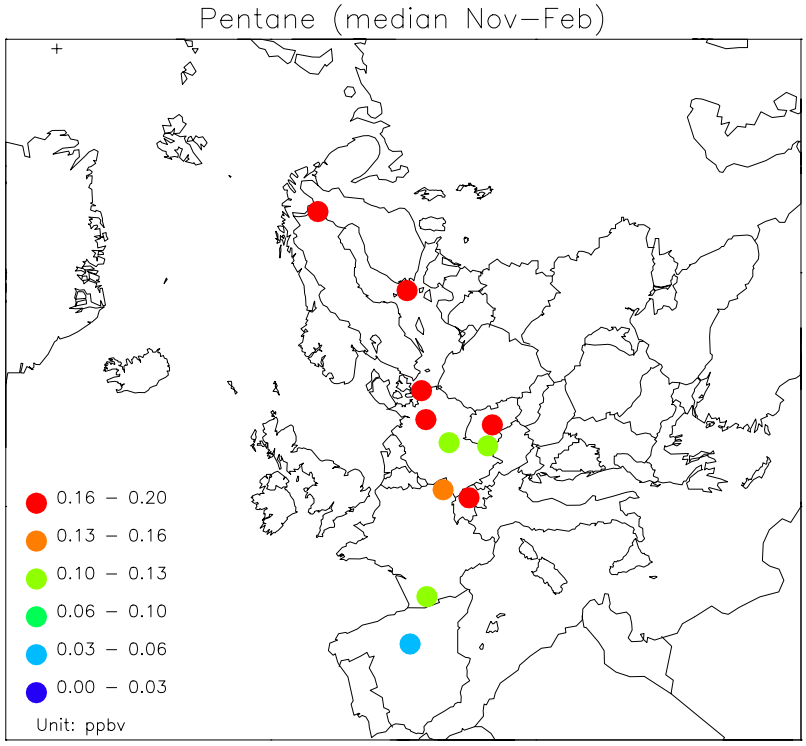


Figure 10: Median concentration of n-pentane at EMEP sites in the winter months November, December, January and February 2001 taken together.

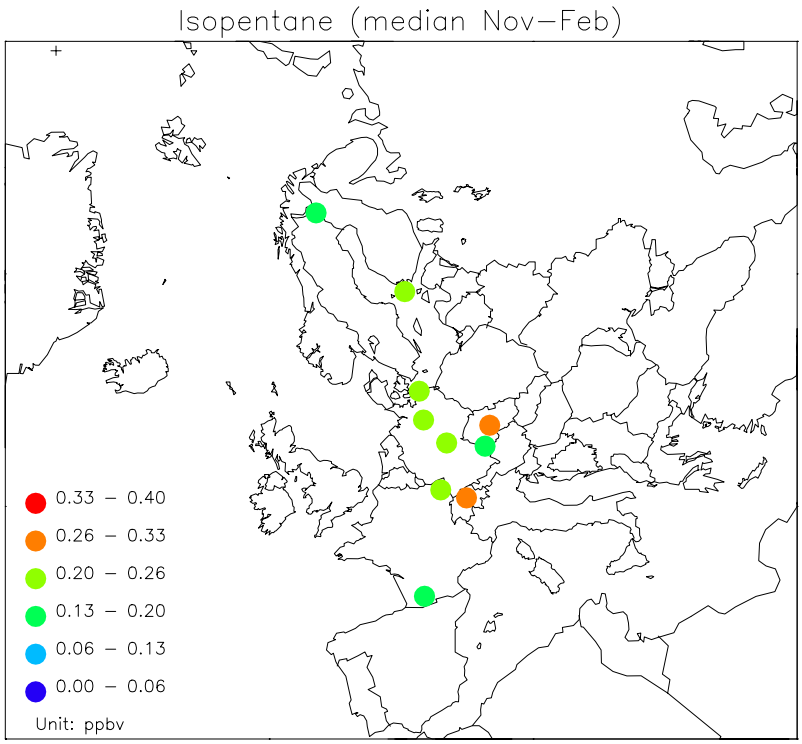


Figure 11: Median concentration of i-pentane at EMEP sites in the winter months November, December, January and February 2001 taken together.

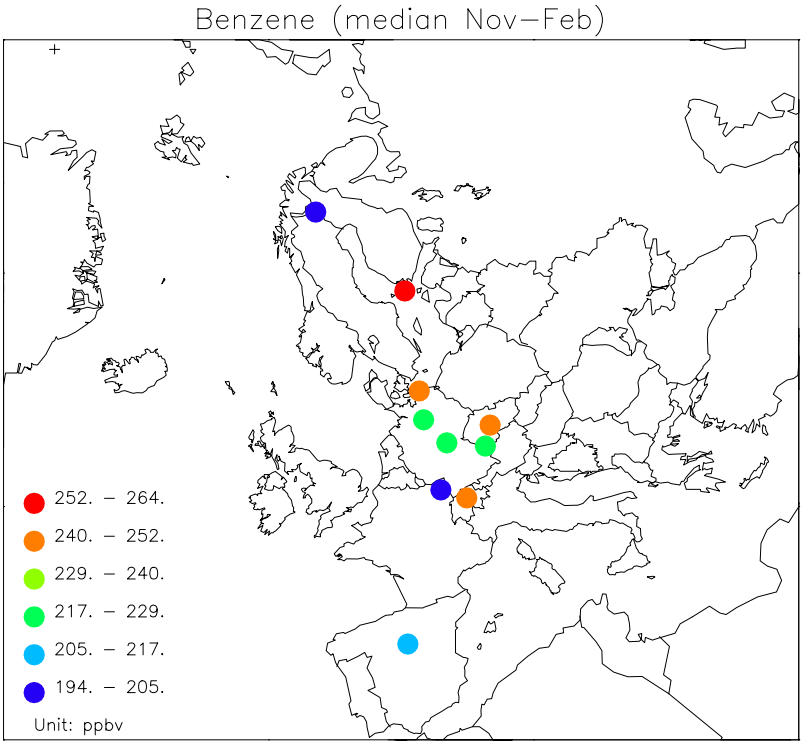


Figure 12: Median concentration of benzene at EMEP sites in the winter months November, December, January and February 2001 taken together.

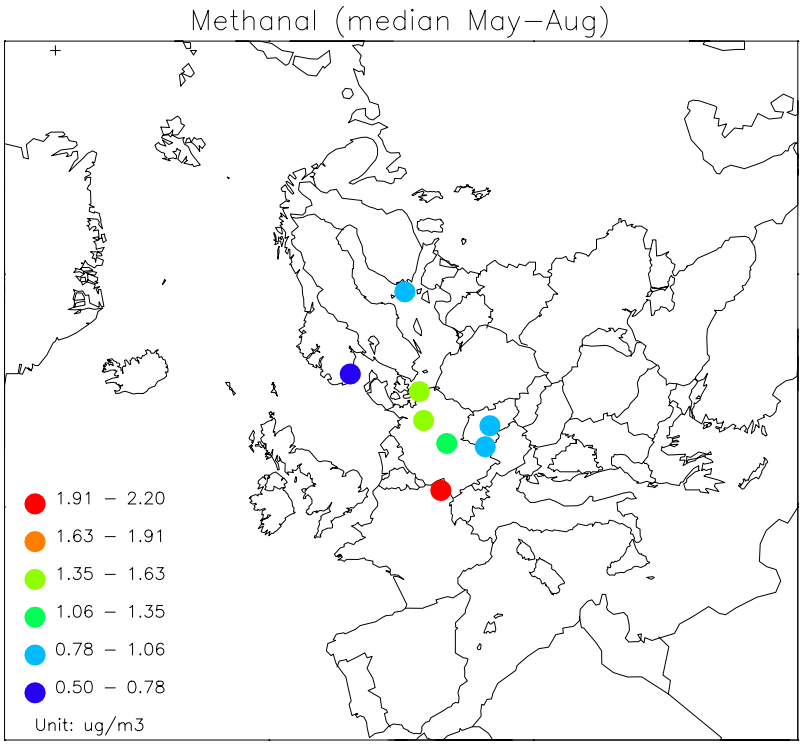


Figure 13: Median concentration of formaldehyde at EMEP sites in the summer months May, June, July and August 2001 taken together.

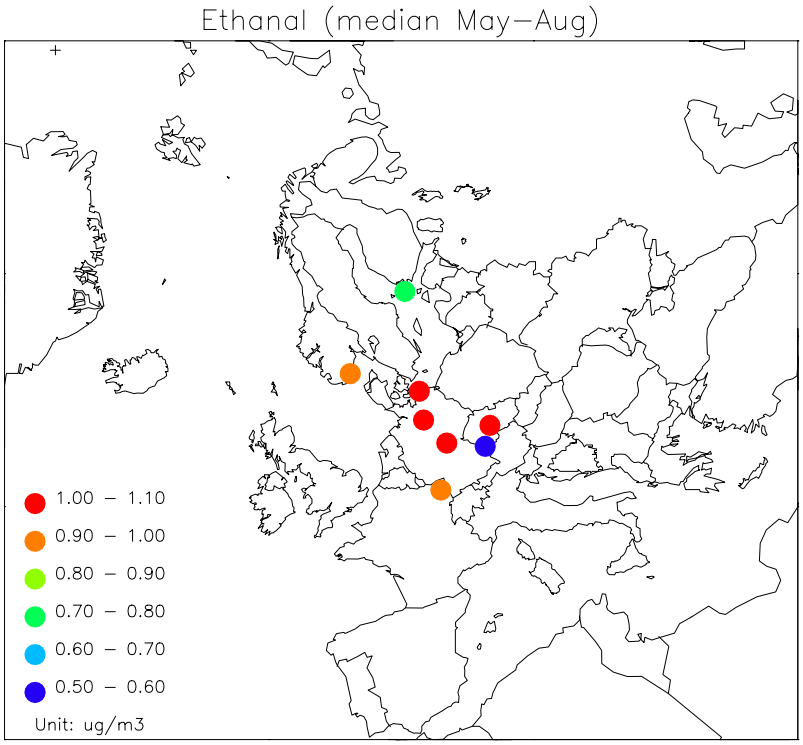


Figure 14: Median concentration of acetaldehyde at EMEP sites in the summer months May, June, July and August 2001 taken together.

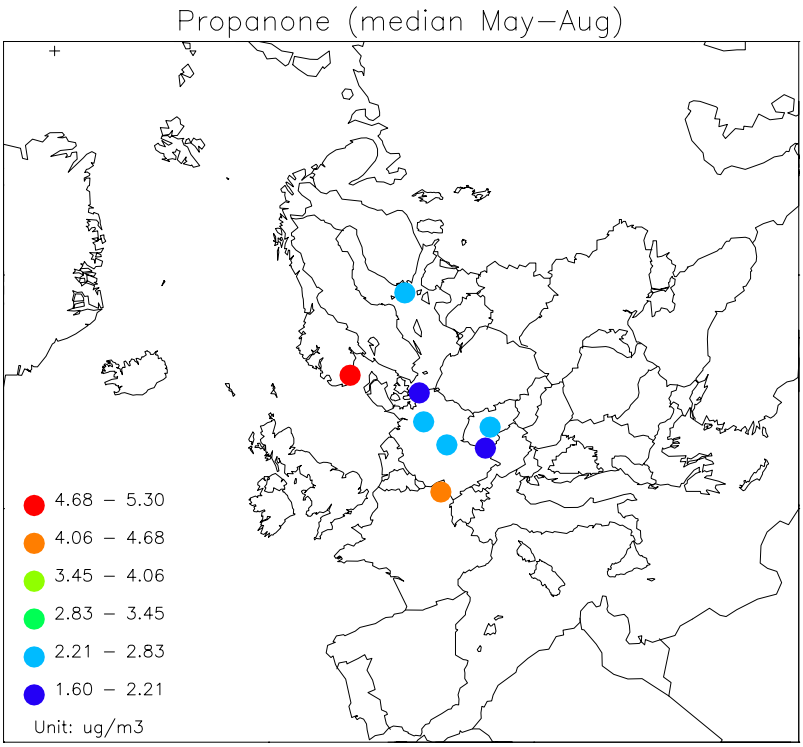


Figure 15: Median concentration of acetone at EMEP sites in the summer months May, June, July and August 2001 taken together.

As noted in previous reports, the measurements indicate that hydrocarbons become fairly well mixed in Europe in winter. Components indicative of natural gas emissions, ethane and propane, were higher in north and east, whereas e.g. ethene, propene and acetylene were higher in central and eastern parts of the continent. n- and i-butane that stems from a number of different emissions sources also show high concentrations to the north.

5. Acknowledgement

We would like to thank all people involved in the sampling and shipment of hydrocarbon canisters and DNPH tubes. We are very grateful for the VOC measurement data provided by Patrice Coddeville (EMD), Hannele Hakola (FMI), Jiri Honzak (CHMI), Marta Mitosinkova (SHMI), Stefan Reimann (EMPA), Montserrat Fernandez San Miguel (MMA) and Karin Uhse (UBA) at the different EMEP VOC sites.

6. References

EMEP/CCC (1990) EMEP workshop on measurement of hydrocarbons/VOC. Lindau, Federal Republic of Germany. Lillestrøm, Norwegian Institute for Air Research (EMEP/CCC Report 3/90).

EMEP/CCC (1995) Expert meeting on EMEP VOC measurements. Berlin, Germany, 30 November–2 December 1994. Kjeller, Norwegian Institute for Air Research (EMEP/CCC Report 6/95).

EMEP/CCC (1996) Manual for sampling and chemical analyses. Kjeller, Norwegian Institute for Air Research (EMEP/CCC Report 1/95).

Hov, Ø, Sorteberg, A., Schmidbauer, N., Solberg, S., Stordal, F., Simpson, D., Lindskog, A., Areskoug, H., Oyola, P., Lättilä, H. and Heidam, N.Z. (1997) European VOC emission estimates evaluated by measurements and model calculations. *J. Atmos. Chem., 28*, 173-193.

Laurila, T. and Hakola, H. (1996) Seasonal cycle of C2-C5 hydrocarbons over the Baltic Sea and Northern Finland. *Atmos. Environ., 30,* 1597–1607.

Lindskog, A., Solberg, S., Roemer, M., Klemp, D., Sladkovic, R., Boudries, H., Dutot, A., Hakola, H., Schmitt, R. and Areskoug, H. (1995) The distribution of NMHC in Europe: results from the Eurotrac TOR project. *Water, Air, Soil Poll., 85*, 2027-2032.

Romero, R. (1995) The first laboratory intercomparison of light hydrocarbons in EMEP. Stockholm University, Institute of Applied Environmental Research, Air Pollution Laboratory/Kjeller, Norwegian Institute for Air Research (EMEP/CCC Report 2/95).

Solberg, S., Dye, C., Schmidbauer, N., Herzog, A. and Gehrig, R. (1996) Carbonyls and nonmethane hydrocarbons at rural European sites from the Mediterranean to the Arctic. *J. Atmos. Chem., 25,* 33–66.

Solberg, S., Dye, C., Schmidbauer, N. and Simpson, D. (1995) Evaluation of the VOC measurement programme within EMEP. Kjeller, Norwegian Institute for Air Research (EMEP/CCC Report 5/95).

Solberg, S., Dye, C., Schmidbauer, N., Wallasch, M. and Junek, R. (2002) VOC measurements 2000. Kjeller, Norwegian Institute for Air Research (EMEP/CCC Report 8/2002).

Solberg, S., Dye, C., Walker, S.-E. and Simpson, D. (2001) Long-term measurements and model calculations of formaldehyde at rural European monitoring sites. *Atmos. Environ., 35*, 195-207.

Appendix A

Monthly mean and median concentrations of hydrocarbons and carbonyls in 2001

Monthly mean and median concentrations (first and second line, respectively) of hydrocarbons (pptv)

ETHANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	2235	2767	2446	2054	1282	936	586	739	830	888	1600	2253
	1943	2550	2315	1933	1275	1003	568	730	791	996	1527	2186
Utö	1967	2599	2641	2034	1408	944	841	866	748	924	1947	2533
	1938	2631	2492	2066	1416	941	875	806	763	935	1767	2421
Zingst	3182	2679	2643	1827	1213	1036	791	754	1216	1701	2014	2369
	2778	2446	2286	1834	1225	1014	750	780	1040	1441	1745	1931
Waldhof	3106	2716	2527	1871	1284	1173	948	765	1105	1725	1861	2208
	2768	2532	2429	1855	1217	1181	810	706	965	1668	1726	2243
Schmücke	2599	2470	2188	1693	1109	1037	712	798	1475	1628	1983	1802
	2520	2413	2076	1717	1096	1039	746	632	1576	1622	1708	1876
Brotjacklriegel	2391	2340	2003	1667	1145	988	786	792	1182	1448	1905	1955
	2189	2470	1862	1682	1186	914	762	779	1098	1270	1982	1704
Starina	3207	3348	4770	-	1527	1260	1514	1396	1223	-	-	-
	2570	3250	4770	-	1550	1290	1820	1365	1290	-	-	-
Košetice	3307	2359	2643	2081	1195	1305	930	1013	1026	1269	2092	2972
	2582	2246	2698	2081	1116	1204	893	939	931	1153	2039	2818
Rigi	-	-	-	-	-	-	829	849	1245	1152	1591	2465
	-	-	-	-	-	-	806	841	970	1111	1558	2345
Donon	2001	2191	2106	1816	1472	1296	910	844	1023	1048	1826	2084
	1830	2245	1840	1765	1370	1290	915	820	945	990	1855	2130
Peyrusse Vieille	2109	2025	1699	1768	1497	996	829	828	916	1106	-	3043
	2220	2025	1715	1860	1540	1010	750	810	960	1070	-	2595
Campisabalos	-	1051	921	823	724	622	513	528	632	698	895	897
	-	1085	880	846	740	626	516	524	525	713	895	906

ETHENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	780	344	191	131	43	86	97	92	121	104	331	381
	763	310	133	106	43	80	87	83	112	86	268	288
Utö	755	552	655	319	156	140	127	155	260	264	575	908
	771	530	685	225	124	143	112	152	194	173	256	954
Zingst	1802	1004	838	354	185	169	196	211	471	888	768	1088
	1410	645	636	305	175	161	209	203	420	682	319	1036
Waldhof	1734	799	1114	531	274	280	221	311	422	816	749	1104
	1356	931	785	386	225	254	194	216	311	819	430	806
Schmücke	1292	764	858	242	166	192	116	170	568	732	794	633
	940	587	599	213	141	178	111	113	404	621	316	671
Brotjacklriegel	1093	736	925	283	230	249	238	227	498	827	1129	783
	925	689	649	228	174	243	206	224	502	930	1193	762
Starina	5336	6058	5650	-	387	335	584	984	595	-	-	-
	2810	5915	5650	-	385	270	570	1000	645	-	-	-
Košetice	2812	1162	1530	478	359	252	236	218	348	606	1843	1569
	2835	909	1212	445	253	246	179	183	360	565	1116	1484
Rigi	-	-	-	-	-	-	214	320	356	303	616	1544
	-	-	-	-	-	-	199	268	270	227	506	1331
Donon	1028	1065	714	341	317	200	178	230	288	268	943	841
	930	1025	435	280	280	175	155	210	245	260	865	810
Peyrusse Vieille	1126	663	275	276	289	211	290	302	326	484	-	2361
	1080	725	250	300	270	200	260	330	190	390	-	1770
Campisabalos	966	388	183	331	351	357	387	374	365	426	268	301
	1030	405	60	306	359	351	415	418	382	436	332	392

PROPANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	1329	1535	1101	655	219	127	154	163	218	305	759	1074
	1260	1247	935	572	191	141	155	158	160	298	660	1101
Utö	1072	1610	1212	722	268	180	250	222	267	331	966	1312
	957	1434	1101	680	217	183	245	201	278	288	803	1362
Zingst	1450	1249	1255	694	312	359	283	306	454	706	874	1423
	1391	1121	1231	737	313	327	221	242	391	645	641	1297
Waldhof	1450	1499	1359	825	376	443	359	294	561	755	876	1156
	1353	1105	1252	853	338	442	213	292	520	753	731	1165
Schmücke	1040	934	1060	656	331	348	166	272	585	637	735	969
	986	957	945	677	309	341	149	222	614	607	550	983
Brotjacklriegel	870	892	915	565	346	293	247	272	419	523	777	1077
	784	909	895	579	315	292	246	276	362	459	778	1054
Starina	1673	1766	2640	-	557	383	687	704	603	-	-	-
	1420	1645	2640	-	510	370	740	705	635	-	-	-
Košetice	1605	1075	1322	690	366	301	258	283	315	466	897	1517
	1343	1117	1258	709	325	254	233	250	323	450	879	1402
Rigi	-	-	-	-	-	-	281	308	415	419	728	1231
	-	-	-	-	-	-	282	285	329	370	715	1125
Donon	931	999	876	546	377	341	438	314	416	351	893	1004
	870	1080	700	510	305	260	405	290	380	310	840	1010
Peyrusse Vieille	1030	915	611	498	382	199	256	284	293	398	-	1709
	980	935	580	530	370	210	230	280	320	380	-	1510
Campisabalos	246	393	333	196	154	150	164	154	239	232	385	346
	270	420	239	195	155	140	169	156	184	240	337	355

PROPENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	56	41	31	32	27	32	34	32	28	24	38	40
	56	37	32	30	27	27	30	33	31	25	29	29
Utö	85	68	89	63	44	39	46	40	39	36	65	95
	95	55	82	54	41	40	44	41	35	30	35	65
Zingst	212	121	94	64	55	53	53	61	81	118	145	189
	196	79	72	62	47	44	51	48	66	101	55	136
Waldhof	215	125	185	84	77	71	51	87	109	147	157	207
	181	124	179	68	52	67	46	57	99	163	61	155
Schmücke	136	108	123	50	46	50	34	39	92	121	138	141
	115	99	106	46	45	42	37	34	84	126	62	113
Brotjacklriegel	119	97	127	54	57	58	53	46	77	124	171	125
	97	95	95	56	44	54	45	44	75	123	175	92
Starina	863	2023	1280	-	127	128	269	393	252	-	-	-
	330	1415	1280	-	115	105	270	395	305	-	-	-
Košetice	369	158	200	73	70	54	54	34	61	73	326	291
	358	104	244	65	52	40	54	29	69	67	179	283
Rigi	-	-	-	-	-	-	98	78	85	62	158	234
	-	-	-	-	-	-	95	71	74	46	128	196
Donon	177	198	123	90	76	71	75	98	80	81	199	168
	120	180	90	70	70	70	70	100	80	80	150	170
Peyrusse Vieille	197	123	81	82	100	91	124	122	110	146	-	348
	150	115	75	80	100	90	110	130	80	120	-	300
Campisabalos	551	320	197	286	301	321	324	343	351	378	146	97
	470	320	240	261	321	325	322	368	324	398	89	122

ETHYNE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	886	645	585	443	167	101	87	89	122	165	450	505
	859	650	540	399	148	108	88	75	91	139	293	450
Utö	670	881	884	538	266	145	140	157	297	268	571	785
	640	733	897	525	257	127	132	132	268	207	348	893
Zingst	1630	1053	1406	680	369	188	187	225	452	713	700	1140
	1196	811	1293	615	325	174	148	202	284	526	446	1085
Waldhof	1565	892	1545	656	352	308	216	195	328	612	622	1069
	1174	810	1567	625	330	300	187	184	212	505	418	822
Schmücke	1308	895	1321	654	344	316	151	248	605	738	648	781
	1065	767	1025	670	399	316	134	192	561	520	367	776
Brotjacklriegel	1077	867	1277	607	441	304	257	400	569	805	929	994
	1025	900	1314	593	435	296	233	415	364	729	912	881
Starina	4426	4606	3460	-	-	-	-	-	-	-	-	-
	4320	4690	3460	-	-	-	-	-	-	-	-	-
Košetice	2563	1299	1855	841	549	712	287	424	428	659	1447	1759
	2580	1130	1922	813	428	306	241	404	385	520	919	1385
Rigi	-	-	-	-	-	-	230	292	279	281	424	1064
	-	-	-	-	-	-	219	276	227	218	381	897
Donon	672	654	641	285	296	183	145	182	225	212	531	540
	580	690	490	290	245	140	115	180	195	190	565	510
Peyrusse Vieille	599	554	314	302	214	113	153	182	157	232	-	1219
	640	580	335	260	200	120	140	170	190	200	-	875
Campisabalos	227	155	89	124	83	115	131	96	422	316	159	198
	230	165	50	108	92	101	135	108	286	332	178	220

BUTANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	605	608	385	200	39	30	36	55	64	109	336	432
	656	463	341	171	40	27	38	55	40	105	271	438
Utö	565	673	472	249	67	111	98	87	129	143	380	547
	498	589	468	214	44	60	92	81	111	139	293	562
Zingst	650	505	485	224	137	163	132	159	194	348	413	658
	613	444	448	224	111	153	117	133	178	273	235	610
Waldhof	655	629	570	274	157	219	162	139	242	387	427	564
	654	439	515	292	130	194	103	143	214	372	354	529
Schmücke	516	450	476	233	157	152	83	133	272	350	342	582
	440	384	478	255	140	164	78	111	309	274	250	553
Brotjacklriegel	345	339	359	201	158	128	118	125	177	263	366	511
	302	332	330	185	127	125	122	113	177	242	328	517
Starina	893	929	1200	-	678	343	800	945	1130	-	-	-
	540	750	1200	-	535	365	760	905	900	-	-	-
Košetice	703	415	578	237	141	131	114	115	156	210	393	637
	587	415	684	217	115	121	100	103	166	229	374	624
Rigi	-	-	-	-	-	-	183	202	185	219	368	560
	-	-	-	-	-	-	169	183	152	146	321	512
Donon	544	510	355	139	178	151	145	156	154	161	385	426
	420	510	240	130	110	120	150	130	150	90	360	420
Peyrusse Vieille	459	318	164	180	129	69	81	104	87	122	-	571
	460	335	155	190	90	70	70	100	100	110	-	505
Campisabalos	101	205	177	122	101	94	145	133	154	175	143	135
	100	195	141	126	98	74	179	139	139	115	131	134

ISOBUTANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	378	335	208	99	23	15	14	22	35	51	170	228
	376	246	172	75	23	16	17	25	23	49	146	260
Utö	261	363	241	152	36	43	41	49	62	69	214	293
	244	319	204	126	23	31	49	42	67	56	161	299
Zingst	361	283	268	132	82	84	70	84	110	180	219	382
	331	253	245	121	65	77	58	78	105	138	131	390
Waldhof	360	314	322	159	92	116	114	78	135	223	232	291
	374	226	282	156	70	105	55	67	126	211	196	258
Schmücke	277	224	250	122	89	85	42	66	149	196	177	298
	248	201	222	127	84	95	38	53	176	146	122	294
Brotjacklriegel	199	197	209	112	88	79	90	82	123	156	231	411
	168	193	195	114	75	76	79	72	102	126	214	326
Starina	630	549	720	-	252	113	289	253	290	-	-	-
	300	450	720	-	210	115	290	245	215	-	-	-
Košetice	421	269	358	141	84	75	69	74	88	122	230	580
	336	243	323	150	76	62	61	60	91	109	223	351
Rigi	-	-	-	-	-	-	88	95	99	110	190	302
	-	-	-	-	-	-	83	86	80	75	166	272
Donon	398	370	273	110	130	101	100	158	130	123	255	280
	180	345	190	110	90	75	100	110	105	60	240	290
Peyrusse Vieille	324	242	113	82	80	34	30	26	37	44	-	389
	360	240	100	80	80	40	30	20	40	40	-	225
Campisabalos	192	73	58	33	31	37	44	33	53	51	131	153
	210	75	52	29	30	32	45	35	39	38	88	167

BUT_1_ENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	3	3	3	4	7	9	9	7	5	4	8	6
	3	3	3	3	4	9	9	7	3	3	8	3
Utö	5	5	15	9	9	11	13	9	10	8	15	15
	3	3	9	7	10	11	13	9	9	9	12	16
Zingst	47	30	25	21	20	19	18	20	28	26	35	38
	50	27	21	19	20	19	19	18	25	24	21	32
Waldhof	48	33	42	25	25	21	18	22	33	36	40	47
	43	31	44	23	21	21	19	20	31	33	25	44
Schmücke	39	34	33	17	20	22	16	18	25	35	34	45
	34	31	28	17	20	20	15	17	24	37	21	40
Brotjacklriegel	36	32	33	21	21	21	20	19	24	34	42	35
	28	33	33	20	20	21	19	20	22	34	41	29
Starina	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Rigi	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Donon	22	23	15	7	7	6	6	10	8	7	26	18
	20	20	8	5	5	5	5	10	8	5	25	20
Peyrusse Vieille	34	23	14	14	23	17	29	30	37	54	-	63
	30	20	15	20	20	20	30	30	10	40	-	65
Campisabalos	19	84	80	78	85	95	108	99	96	105	76	66
	20	80	67	67	96	95	108	108	91	113	84	75

TRANS_2_BUTENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	6	3	3	3	3	3	3	4	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
Utö	10	3	7	3	3	4	3	3	3	4	4	3
	3	3	3	3	3	3	3	3	3	3	3	3
Zingst	7	7	8	6	6	6	6	5	6	5	8	6
	8	7	8	5	6	6	6	5	5	5	6	6
Waldhof	8	8	9	7	6	5	6	4	6	5	8	8
	9	7	9	7	6	5	5	4	6	5	6	7
Schmücke	12	8	9	7	6	8	6	5	6	7	7	27
	7	8	9	7	7	8	4	4	6	6	6	6
Brotjacklriegel	7	9	8	7	6	6	7	4	8	9	12	7
	6	9	9	6	6	6	5	4	7	8	10	7
Starina	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Rigi	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Donon	5	5	5	5	5	5	5	6	5	5	6	6
	5	5	5	5	5	5	5	5	5	5	5	5
Peyrusse Vieille	5	5	5	5	6	5	5	5	5	6	-	6
	5	5	5	5	5	5	5	5	5	5	-	5
Campisabalos	101	21	31	15	21	19	24	18	21	20	16	14
	110	20	18	16	22	18	23	21	20	22	16	16

CIS_2_BUTENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	3	3	3	3	3	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
Utö	3	24	3	3	3	4	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
Zingst	10	9	14	9	7	10	6	6	8	6	9	8
	8	9	15	9	8	10	5	4	6	5	10	7
Waldhof	11	12	14	8	7	6	6	4	5	6	10	10
	10	11	15	9	7	6	5	4	5	5	7	8
Schmücke	16	13	14	8	9	10	5	4	8	10	9	25
	11	14	12	7	6	10	5	3	8	10	8	10
Brotjacklriegel	9	9	11	9	8	6	9	4	9	9	13	8
	9	8	9	11	7	5	8	4	9	8	12	7
Starina	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Rigi	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Donon	5	5	5	5	5	5	5	6	5	5	6	6
	5	5	5	5	5	5	5	5	5	5	5	5
Peyrusse Vieille	5	5	5	5	5	5	5	5	5	5	-	6
	5	5	5	5	5	5	5	5	5	5	-	5
Campisabalos	70	75	76	50	41	44	56	37	95	164	245	361
	80	75	50	43	39	37	54	39	43	66	90	420

PENTANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	214	202	110	51	11	14	19	23	26	40	157	163
	240	163	91	38	12	12	18	17	16	38	99	171
Utö	173	268	150	80	29	37	40	40	74	55	178	199
	148	196	143	55	19	28	31	42	58	52	105	208
Zingst	218	162	144	75	55	92	144	79	98	143	147	235
	207	136	131	75	49	53	52	45	91	124	104	230
Waldhof	250	219	215	89	72	120	67	72	161	172	202	185
	242	118	164	86	66	104	40	59	100	150	131	169
Schmücke	171	128	148	71	78	68	59	65	119	145	121	268
	151	118	148	67	63	69	46	50	126	113	71	202
Brotjacklriegel	119	109	128	69	71	78	171	99	117	144	160	174
	102	100	107	69	66	74	100	98	121	132	151	166
Starina	814	1803	2760	-	1690	495	497	661	388	-	-	-
	860	1865	2760	-	1575	370	430	615	285	-	-	-
Košetice	288	141	269	87	69	60	59	55	81	97	151	236
	210	136	250	80	56	56	49	50	85	76	158	211
Rigi	-	-	-	-	-	-	118	139	123	136	181	235
	-	-	-	-	-	-	94	111	84	80	137	202
Donon	139	139	116	34	83	50	69	72	60	63	143	142
	130	145	80	30	55	30	75	70	45	40	125	140
Peyrusse Vieille	123	77	43	50	41	18	29	42	26	42	-	181
	130	75	30	50	30	20	20	40	30	40	-	150
Campisabalos	121	53	51	24	26	31	62	39	49	49	46	30
	110	50	29	22	26	29	57	40	37	49	51	26

ISOPENTANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	304	235	134	68	10	14	22	22	28	44	174	197
	331	191	124	54	11	12	20	16	11	38	115	194
Utö	272	324	221	115	39	69	53	64	94	81	201	256
	270	249	193	81	27	41	47	53	85	75	128	259
Zingst	336	219	200	113	126	131	217	157	143	239	221	316
	335	194	159	100	86	83	97	98	146	185	134	298
Waldhof	355	272	278	113	115	173	110	242	177	284	335	254
	353	182	222	109	92	135	85	111	146	250	209	240
Schmücke	304	191	226	115	122	116	66	111	181	269	182	442
	249	174	217	127	104	117	75	86	210	194	95	289
Brotjacklriegel	190	177	207	102	143	139	365	184	196	289	283	250
	171	157	164	103	117	131	145	110	213	306	286	266
Starina	1009	811	910	-	1025	455	776	655	715	-	-	-
	340	590	910	-	840	295	680	485	495	-	-	-
Košetice	465	236	437	139	120	109	105	107	141	192	261	348
	343	210	400	149	112	114	90	108	134	155	251	321
Rigi	-	-	-	-	-	-	239	277	213	249	307	385
	-	-	-	-	-	-	212	250	162	155	230	334
Donon	233	248	198	64	161	133	170	188	121	104	239	220
	190	255	145	70	115	75	165	170	115	90	225	210
Peyrusse Vieille	266	168	68	84	83	54	70	98	74	96	-	319
	280	160	55	90	80	50	70	110	90	80	-	235
Campisabalos	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-

HEXANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	3	3	5	6	7	12	51	46
	-	-	-	-	3	3	3	3	3	12	26	52
Utö	-	-	-	-	-	20	12	18	46	17	64	62
	-	-	-	-	-	8	11	14	57	16	50	63
Zingst	80	55	50	26	55	54	34	41	26	47	76	99
	75	43	48	25	28	25	29	21	30	38	29	104
Waldhof	86	70	71	23	22	44	31	25	40	59	57	69
	79	44	57	19	16	48	26	21	30	55	45	71
Schmücke	62	43	49	20	23	23	21	19	38	45	39	83
	55	42	48	17	19	19	16	16	40	32	22	74
Brotjacklriegel	42	36	42	21	35	74	32	34	35	51	56	65
	34	34	30	20	30	37	35	32	35	47	57	64
Starina	157	216	320	-	2200	238	560	241	280	-	-	-
	100	210	320	-	1815	225	540	160	340	-	-	-
Košetice	127	54	94	24	25	21	21	17	27	32	48	103
	83	44	91	21	18	22	17	14	24	24	42	81
Rigi	-	-	-	-	-	-	23	27	26	28	45	71
	-	-	-	-	-	-	21	24	22	19	40	58
Donon	37	48	24	8	14	13	15	19	12	12	38	44
	20	40	18	5	5	5	13	20	10	5	30	40
Peyrusse Vieille	39	23	12	18	8	11	8	14	6	9	-	49
	40	25	10	10	5	5	5	10	5	5	-	45
Campisabalos	12	190	211	133	79	101	288	270	619	1340	137	68
	10	90	140	116	63	83	176	236	404	374	105	67

ISOPRENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	4	4	4	4	34	45	57	33	11	7	4	4
	4	4	4	4	4	46	45	32	13	4	4	4
Utö	21	19	17	20	40	15	18	23	4	8	10	15
	4	4	4	4	18	11	15	26	4	4	4	4
Zingst	15	9	9	21	77	147	674	927	158	38	14	12
	13	9	8	13	76	142	654	486	52	46	14	12
Waldhof	17	12	10	21	23	61	65	70	44	24	15	10
	14	13	10	22	24	42	40	55	46	21	12	9
Schmücke	28	13	11	16	34	59	37	51	23	19	14	17
	21	13	11	16	30	56	28	44	23	16	11	13
Brotjacklriegel	12	21	19	30	200	127	322	462	89	94	23	12
	12	12	17	17	281	91	200	355	81	58	21	10
Starina	76	80	100	-	932	545	400	143	100	-	-	-
	60	55	100	-	745	430	170	140	90	-	-	-
Košetice	15	6	13	9	46	41	92	234	62	21	47	13
	7	3	13	5	32	51	71	271	42	21	10	12
Rigi	-	-	-	-	-	-	116	106	29	37	26	20
	-	-	-	-	-	-	56	51	21	15	23	16
Donon	34	27	23	35	423	669	1378	872	193	378	119	106
	40	25	25	40	315	555	1150	740	190	290	90	40
Peyrusse Vieille	5	10	20	58	536	1617	1139	1354	453	500	-	10
	5	5	8	20	480	1390	910	870	340	350	-	8
Campisabalos	124	11	13	24	26	65	59	100	176	24	15	12
	60	10	10	10	18	57	51	51	64	20	10	9

BENZENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	393	240	203	132	55	33	65	63	53	75	162	173
	390	232	177	116	57	29	54	71	38	77	112	154
Utö	294	272	289	193	78	53	93	75	161	91	202	266
	270	250	277	141	69	44	96	72	104	75	124	302
Zingst	391	260	328	159	74	63	82	72	197	195	189	309
	289	186	305	149	70	50	51	63	144	167	125	287
Waldhof	376	220	361	159	90	137	71	59	163	161	157	280
	266	193	364	146	79	79	62	46	117	154	110	229
Schmücke	315	208	297	148	94	81	49	90	158	196	169	293
	258	193	235	144	96	75	49	63	151	185	116	266
Brotjacklriegel	256	200	279	134	103	78	73	99	130	211	230	270
	241	216	283	136	92	80	76	99	101	198	206	273
Starina	683	373	480	-	1197	1443	257	254	292	-	-	-
	440	345	480	-	465	1030	280	255	280	-	-	-
Košetice	395	169	346	152	102	77	66	87	80	122	277	328
	341	153	363	149	91	77	65	76	76	112	208	289
Rigi	-	-	-	-	-	-	88	103	105	114	216	389
	-	-	-	-	-	-	82	97	86	83	186	327
Donon	221	228	200	106	102	54	48	80	96	73	189	202
	190	245	135	105	85	50	40	90	75	60	185	200
Peyrusse Vieille	-	-	-	-	-	-	-	-	-	-	-	438
	-	-	-	-	-	-	-	-	-	-	-	315
Campisabalos	73	216	179	220	182	258	301	706	440	444	350	201
	50	215	210	216	157	249	286	657	418	422	376	201

TOLUENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Utö	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Zingst	297	185	158	106	79	74	137	127	120	184	259	236
	273	166	137	96	78	61	94	112	110	148	182	225
Waldhof	316	203	246	103	113	122	113	108	166	256	309	238
	329	186	199	84	103	118	75	82	151	266	157	221
Schmücke	289	197	227	104	133	128	83	104	158	253	193	283
	264	188	185	100	110	142	63	78	172	170	100	274
Brotjacklriegel	177	153	206	99	115	117	148	124	199	217	317	216
	156	144	159	95	92	112	98	84	223	214	283	218
Starina	1010	906	2990	-	1122	1568	293	354	813	-	-	-
	630	740	2990	-	1075	1555	260	270	520	-	-	-
Košetice	314	142	223	112	109	99	100	77	118	152	273	308
	282	109	247	79	96	95	59	78	100	128	240	299
Rigi	-	-	-	-	-	-	194	234	219	252	311	458
	-	-	-	-	-	-	170	185	169	159	242	339
Donon	218	221	176	49	109	90	88	120	108	87	219	184
	200	220	115	45	90	60	65	120	110	80	220	180
Peyrusse Vieille	251	148	64	64	69	46	64	94	76	92	-	350
	240	135	55	60	60	40	60	80	60	80	-	265
Campisabalos	149	895	670	1173	1284	1237	2559	1698	1328	1576	1223	554
	90	530	670	1173	544	1249	2047	929	1040	1127	530	346

ETHYLBENZENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Utö	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Brotjacklriegel	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Starina	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	64	31	36	26	21	18	18	16	19	28	42	48
	63	30	36	16	17	16	14	15	17	29	40	44
Rigi	-	-	-	-	-	-	20	29	26	40	56	73
	-	-	-	-	-	-	15	22	18	31	43	58
Donon	46	43	33	11	23	14	15	44	21	18	42	33
	40	45	20	10	20	10	13	20	20	20	40	30
Peyrusse Vieille	46	28	12	14	14	14	11	15	17	20	-	49
	40	30	10	10	10	10	10	10	20	20	-	30
Campisabalos	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-

MPXYLENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Utö	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Zingst	101	49	38	39	21	31	35	40	38	85	79	68
	97	43	25	39	14	39	30	31	28	39	35	64
Waldhof	114	84	84	34	29	43	22	31	53	73	102	80
	95	69	61	34	24	42	13	25	47	75	52	83
Schmücke	118	76	87	39	38	51	36	40	75	75	89	119
	109	85	71	43	32	41	23	30	69	83	53	108
Brotjacklriegel	44	48	71	30	32	30	34	35	60	72	107	64
	43	41	67	27	19	29	20	40	53	72	82	54
Starina	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	137	58	74	54	50	41	49	35	48	63	103	123
	127	46	74	56	34	30	35	32	50	61	94	109
Rigi	-	-	-	-	-	-	49	55	62	83	120	179
	-	-	-	-	-	-	44	40	44	57	105	128
Donon	102	103	69	20	27	18	23	84	36	34	109	81
	60	100	45	20	30	20	20	30	35	30	85	70
Peyrusse Vieille	86	37	24	22	21	17	19	34	21	22	-	103
	80	35	25	20	20	20	20	30	20	20	-	80
Campisabalos	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-

OXYLENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Utö	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Zingst	33	16	15	14	7	3	12	20	22	36	39	24
	28	15	13	14	6	3	8	17	18	18	41	19
Waldhof	42	30	34	10	10	13	7	11	20	29	36	25
	38	27	23	10	7	13	4	9	19	23	25	23
Schmücke	42	26	32	13	12	34	15	19	24	26	25	39
	37	30	27	12	12	34	9	20	21	22	14	34
Brotjacklriegel	16	11	23	17	16	11	10	18	24	23	31	19
	13	12	21	14	9	11	8	14	16	22	23	19
Starina	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	51	25	27	21	19	15	15	12	15	21	38	45
	52	19	29	19	13	11	14	12	15	22	32	41
Rigi	-	-	-	-	-	-	22	27	25	40	63	74
	-	-	-	-	-	-	19	20	18	28	51	56
Donon	44	45	32	16	18	11	14	34	18	14	44	34
	30	40	25	20	20	10	15	20	20	10	40	30
Peyrusse Vieille	41	23	20	20	19	14	14	22	21	22	-	54
	40	20	20	20	20	10	10	20	20	20	-	40
Campisabalos	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-

Monthly mean and median concentrations (first and second line, respectively) of carbonyls ($\mu g\ m^{-3}$)

METHANAL

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.205	0.185	0.205	0.457	0.621	0.610	2.263	3.782	0.797	0.455	0.332	0.347
	0.160	0.190	0.190	0.490	0.590	0.580	2.320	3.310	0.730	0.380	0.290	0.300
Birkenes	0.192	0.191	0.145	0.227	0.471	0.708	0.905	0.566	0.491	0.408	0.248	0.181
	0.140	0.165	0.145	0.220	0.420	0.450	0.780	0.600	0.480	0.400	0.205	0.165
Zingst	1.022	0.825	0.721	0.563	1.577	1.677	1.898	1.994	0.809	1.171	0.751	0.784
	0.851	0.772	0.618	0.493	1.073	1.614	1.653	1.541	0.811	1.091	0.810	0.749
Waldhof-UBA	0.866	0.773	0.842	1.131	1.464	1.167	2.445	2.105	1.077	1.217	0.587	0.731
	0.802	0.745	0.823	1.115	1.531	1.140	1.944	1.480	0.912	0.992	0.540	0.722
Waldhof-NILU	0.282	0.270	0.328	0.350	0.495	0.673	2.264	1.855	0.698	1.146	0.356	0.492
	0.250	0.305	0.270	0.200	0.450	0.485	2.140	1.560	0.695	0.790	0.360	0.480
Schmücke	1.366	0.950	0.860	0.687	1.457	0.966	1.098	1.601	0.678	0.991	0.560	0.646
	1.005	0.906	0.728	0.625	1.063	0.998	1.165	1.193	0.622	0.956	0.544	0.639
Brotjacklriegel	0.282	0.397	0.584	0.563	0.883	0.644	0.901	1.111	0.473	0.599	0.445	0.460
	0.277	0.376	0.531	0.498	0.813	0.678	0.916	0.916	0.415	0.634	0.511	0.492
Košetice	0.618	0.440	0.432	0.475	0.886	0.882	1.146	2.070	0.986	1.252	0.907	0.797
	0.670	0.500	0.410	0.470	0.770	0.835	0.840	2.010	1.030	1.030	0.900	0.830
Donon	0.557	0.888	0.669	0.689	1.879	2.272	3.153	3.075	1.324	1.966	0.825	0.790
	0.466	0.922	0.605	0.615	1.880	1.731	3.005	3.238	1.355	1.752	0.830	0.838

ETHANAL

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.350	0.365	0.446	0.592	0.692	0.468	1.998	3.107	0.496	0.332	0.334	0.438
	0.360	0.360	0.480	0.590	0.630	0.455	1.985	3.160	0.490	0.310	0.310	0.420
Birkenes	0.327	0.356	0.415	1.342	0.685	1.497	1.961	0.868	0.712	0.506	0.236	0.226
	0.290	0.335	0.415	0.470	0.580	1.090	1.360	0.880	0.660	0.510	0.230	0.230
Zingst	0.894	0.683	0.990	0.888	1.896	1.052	1.075	1.073	0.632	0.807	0.583	0.701
	0.723	0.574	0.771	0.859	1.250	0.975	0.987	0.809	0.646	0.748	0.539	0.648
Waldhof-UBA	0.794	0.608	1.071	0.853	1.284	0.990	1.335	0.936	0.672	0.952	0.624	0.741
	0.723	0.654	1.094	0.886	1.229	0.919	1.202	0.851	0.600	0.885	0.561	0.709
Waldhof-NILU	0.635	0.461	0.602	0.463	0.575	0.570	0.914	0.777	0.540	0.830	0.358	0.517
	0.540	0.495	0.500	0.370	0.540	0.550	0.900	0.680	0.545	0.665	0.300	0.495
Schmücke	0.773	0.678	0.805	0.881	1.443	1.004	0.930	1.050	0.617	0.715	0.562	0.674
	0.625	0.543	0.679	0.798	1.396	1.093	0.848	0.880	0.602	0.636	0.473	0.658
Brotjacklriegel	0.288	0.321	0.391	0.467	0.606	0.467	0.503	0.570	0.484	0.433	0.433	0.428
	0.267	0.288	0.379	0.420	0.531	0.434	0.515	0.548	0.367	0.422	0.393	0.423
Košetice	0.923	0.568	0.564	0.628	0.968	0.868	1.388	2.158	0.868	1.197	0.867	0.822
	0.950	0.550	0.520	0.590	0.870	0.970	1.130	2.150	0.835	1.195	0.755	0.740
Donon	0.404	0.653	0.453	0.417	0.991	0.800	1.020	1.025	0.593	0.705	0.722	0.723
	0.312	0.615	0.357	0.355	1.074	0.583	0.913	1.046	0.594	0.761	0.806	0.701

PROPANONE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.711	0.985	1.140	1.358	2.284	1.437	3.360	5.215	1.341	0.850	0.835	0.876
	0.680	0.980	1.120	1.350	1.840	1.215	3.005	4.500	1.350	0.880	0.820	0.895
Birkenes	0.888	1.378	1.892	2.855	5.781	7.790	7.995	3.738	3.762	2.258	0.993	0.771
	0.870	1.410	1.765	2.790	4.960	8.860	6.660	3.010	3.515	2.240	0.865	0.765
Zingst	0.932	0.975	1.416	1.350	2.699	1.712	1.334	1.528	1.187	1.543	0.886	0.941
	0.811	0.818	1.271	1.500	1.958	1.661	1.437	1.477	1.204	1.583	0.817	0.820
Waldhof-UBA	1.139	1.069	1.859	1.752	3.329	2.829	3.049	2.020	1.565	2.137	1.162	1.140
	1.083	1.089	1.969	1.333	3.406	2.547	2.801	1.814	1.535	1.788	1.087	1.082
Waldhof-NILU	1.266	1.106	1.714	1.313	2.192	1.963	2.483	1.682	1.715	1.960	1.020	1.108
	1.230	1.130	1.620	1.230	2.350	1.990	1.890	1.560	1.840	1.625	0.970	1.015
Schmücke	1.179	1.239	1.583	1.797	3.364	2.735	2.446	2.790	1.430	2.054	0.977	1.118
	0.909	1.122	1.760	1.396	3.531	2.859	1.983	2.650	1.380	1.751	0.931	1.059
Brotjacklriegel	2.204	1.972	1.343	1.584	2.009	1.917	1.770	1.994	1.115	1.113	1.255	1.872
	2.135	1.838	1.025	1.406	2.115	1.937	1.550	1.916	1.110	1.083	1.088	1.726
Košetice	1.652	1.491	2.004	2.322	2.544	2.847	2.432	2.947	2.155	2.527	1.355	1.336
	1.470	1.340	2.120	1.940	2.750	2.725	2.280	2.730	2.005	2.500	1.320	1.260
Donon	1.284	1.474	1.298	1.353	4.256	4.053	4.765	5.117	2.214	2.335	1.402	1.152
	0.736	1.526	1.236	1.138	4.165	3.298	4.211	4.581	2.356	2.114	1.406	1.072

PROPANAL

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.072	0.091	0.107	0.144	0.190	0.131	0.525	0.730	0.103	0.065	0.055	0.073
	0.080	0.090	0.110	0.140	0.180	0.130	0.590	0.720	0.090	0.070	0.050	0.065
Birkenes	0.066	0.083	0.072	0.084	0.112	0.221	0.240	0.068	0.061	0.047	0.043	0.038
	0.070	0.070	0.070	0.080	0.100	0.150	0.175	0.070	0.060	0.050	0.045	0.040
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-UBA	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-NILU	0.113	0.080	0.096	0.217	0.095	0.116	0.146	0.142	0.083	0.131	0.064	0.086
	0.120	0.080	0.090	0.060	0.080	0.105	0.140	0.130	0.080	0.110	0.060	0.080
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Brotjacklriegel	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	0.136	0.104	0.071	0.114	0.236	0.176	0.271	0.382	0.145	0.217	0.163	0.151
	0.140	0.120	0.060	0.130	0.190	0.180	0.210	0.380	0.155	0.225	0.160	0.130
Donon	0.066	0.110	0.094	0.060	0.159	0.122	0.166	0.137	0.091	0.111	0.272	0.208
	0.051	0.112	0.082	0.055	0.182	0.106	0.152	0.144	0.098	0.119	0.268	0.124

N2PROPENAL

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.010	0.010	0.010	0.015	0.026	0.021	0.071	0.113	0.030	0.021	0.015	0.022
	0.010	0.010	0.010	0.020	0.030	0.020	0.060	0.010	0.030	0.020	0.010	0.010
Birkenes	0.010	0.010	0.010	0.009	0.012	0.017	0.020	0.028	0.010	0.011	0.010	0.015
	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-UBA	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-NILU	0.011	0.010	0.010	0.010	0.012	0.010	0.013	0.015	0.013	0.038	0.018	0.031
	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.040	0.010	0.030
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Brotjacklriegel	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	0.014	0.011	0.010	0.010	0.016	0.010	0.015	0.027	0.027	0.067	0.078	0.064
	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.020	0.020	0.065	0.070	0.060
Donon	0.015	0.014	0.014	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
	0.015	0.015	0.014	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015

N2BUTANONE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.138	0.195	0.233	0.211	0.174	0.113	0.416	0.667	0.144	0.104	0.103	0.146
	0.110	0.230	0.220	0.210	0.180	0.105	0.455	0.670	0.120	0.110	0.090	0.145
Birkenes	0.115	0.185	0.260	0.188	0.204	0.238	0.233	0.146	0.114	0.101	0.081	0.065
	0.110	0.170	0.265	0.190	0.170	0.230	0.190	0.140	0.100	0.100	0.085	0.065
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-UBA	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-NILU	0.221	0.198	0.360	0.336	0.225	0.245	0.222	0.161	0.198	0.184	0.141	0.185
	0.210	0.200	0.340	0.220	0.220	0.220	0.190	0.140	0.240	0.220	0.110	0.175
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Brotjacklriegel	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	0.286	0.212	0.336	0.316	0.316	0.266	0.311	0.470	0.271	0.462	0.232	0.237
	0.270	0.180	0.400	0.300	0.310	0.275	0.280	0.460	0.335	0.440	0.240	0.210
Donon	0.233	0.458	0.296	0.310	0.931	1.152	1.569	1.510	0.401	0.579	0.316	0.235
	0.204	0.422	0.275	0.246	0.857	0.863	1.430	1.586	0.455	0.556	0.306	0.229

N3BUTEN2ONE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.173	0.112	0.330	0.338	0.187	0.163	0.052	0.380	0.060	0.058	0.027	0.025
	0.150	0.150	0.260	0.350	0.190	0.175	0.025	0.025	0.025	0.050	0.025	0.025
Birkenes	0.096	0.149	0.150	0.214	0.130	0.090	0.105	0.041	0.025	0.025	0.025	0.025
	0.120	0.100	0.110	0.220	0.120	0.110	0.100	0.025	0.025	0.025	0.025	0.025
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-UBA	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-NILU	0.062	0.098	0.299	0.508	0.172	0.185	0.076	0.076	0.027	0.491	0.031	0.025
	0.025	0.090	0.440	0.230	0.170	0.210	0.025	0.025	0.025	0.170	0.025	0.025
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Brotjacklriegel	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	0.116	0.102	0.617	0.268	0.067	0.162	0.047	0.026	0.025	0.033	0.025	0.025
	0.110	0.110	0.590	0.250	0.080	0.115	0.025	0.025	0.025	0.025	0.025	0.025
Donon	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-

N2METHYLPROPENAL

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.025	0.025	0.025	0.025	0.025	0.026	0.068	0.138	0.022	0.025	0.025	0.025
	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Birkenes	0.025	0.025	0.025	0.022	0.028	0.030	0.035	0.033	0.024	0.025	0.025	0.025
	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-UBA	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-NILU	0.025	0.035	0.042	0.255	0.129	0.045	0.040	0.067	0.025	0.024	0.025	0.025
	0.025	0.025	0.025	0.090	0.105	0.025	0.030	0.040	0.025	0.025	0.025	0.025
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Brotjacklriegel	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	0.027	0.035	0.025	0.037	0.026	0.026	0.033	0.047	0.025	0.026	0.022	0.025
	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.040	0.025	0.025	0.025	0.025
Donon	0.015	0.016	0.012	0.059	0.143	0.188	0.368	0.339	0.063	0.115	0.011	0.013
	0.011	0.011	0.011	0.069	0.086	0.117	0.319	0.345	0.074	0.103	0.011	0.011

BENZENECARBALDEHYDE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.051	0.061	0.065	0.076	0.092	0.097	0.241	0.411	0.042	0.031	0.031	0.032
	0.050	0.060	0.060	0.080	0.100	0.080	0.235	0.420	0.030	0.030	0.030	0.030
Birkenes	0.044	0.053	0.057	0.046	0.051	0.065	0.066	0.038	0.027	0.033	0.028	0.030
	0.050	0.055	0.050	0.050	0.050	0.060	0.070	0.040	0.030	0.030	0.030	0.030
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-UBA	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-NILU	0.054	0.040	0.053	0.200	0.064	0.052	0.132	0.050	0.040	0.063	0.030	0.037
	0.040	0.040	0.050	0.040	0.060	0.055	0.060	0.050	0.030	0.055	0.030	0.035
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Brotjacklriegel	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	0.061	0.057	0.062	0.067	0.091	0.065	0.098	0.068	0.057	0.042	0.052	0.047
	0.050	0.040	0.070	0.060	0.090	0.070	0.080	0.060	0.050	0.045	0.050	0.040
Donon	0.021	0.033	0.034	0.025	0.053	0.030	0.052	0.078	0.059	0.078	0.047	0.041
	0.015	0.025	0.023	0.016	0.047	0.015	0.051	0.082	0.054	0.080	0.044	0.049

PENTANAL

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.080	0.085	0.073	0.240	0.298	0.331	1.140	1.224	0.093	0.100	0.082	0.048
	0.090	0.100	0.070	0.180	0.290	0.355	0.820	0.950	0.030	0.060	0.020	0.045
Birkenes	0.117	0.075	0.042	0.164	0.230	0.244	0.200	0.054	0.021	0.022	0.053	0.020
	0.110	0.070	0.035	0.140	0.260	0.200	0.175	0.050	0.020	0.020	0.020	0.020
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-UBA	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-NILU	0.203	0.266	0.234	0.577	0.375	0.486	0.058	0.038	0.053	0.026	0.020	0.020
	0.200	0.270	0.200	0.260	0.350	0.550	0.030	0.040	0.030	0.025	0.020	0.020
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Brotjacklriegel	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	0.150	0.181	0.147	0.262	0.234	0.158	0.224	0.151	0.048	0.052	0.028	0.027
	0.160	0.170	0.150	0.220	0.210	0.145	0.220	0.150	0.055	0.050	0.025	0.020
Donon	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-

ETHANEDIAL

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.133	0.108	0.155	0.163	0.141	0.118	0.110	0.156	0.042	0.030	0.018	0.023
	0.140	0.110	0.170	0.160	0.140	0.120	0.100	0.015	0.020	0.030	0.015	0.017
Birkenes	0.070	0.111	0.175	0.147	0.128	0.117	0.121	0.026	0.015	0.015	0.015	0.015
	0.060	0.110	0.165	0.140	0.130	0.130	0.090	0.020	0.015	0.015	0.015	0.015
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-UBA	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-NILU	0.080	0.065	0.142	0.129	0.126	0.100	0.217	0.123	0.036	0.043	0.016	0.021
	0.060	0.060	0.170	0.090	0.110	0.085	0.100	0.080	0.035	0.030	0.015	0.017
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Brotjacklriegel	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	0.203	0.114	0.161	0.117	0.133	0.064	0.055	0.087	0.032	0.057	0.035	0.034
	0.190	0.090	0.140	0.110	0.110	0.040	0.060	0.060	0.022	0.055	0.025	0.015
Donon	0.016	0.025	0.023	0.017	0.057	0.100	0.112	0.084	0.035	0.021	0.011	0.013
	0.012	0.018	0.017	0.012	0.050	0.059	0.117	0.082	0.037	0.011	0.011	0.011

HEXANAL

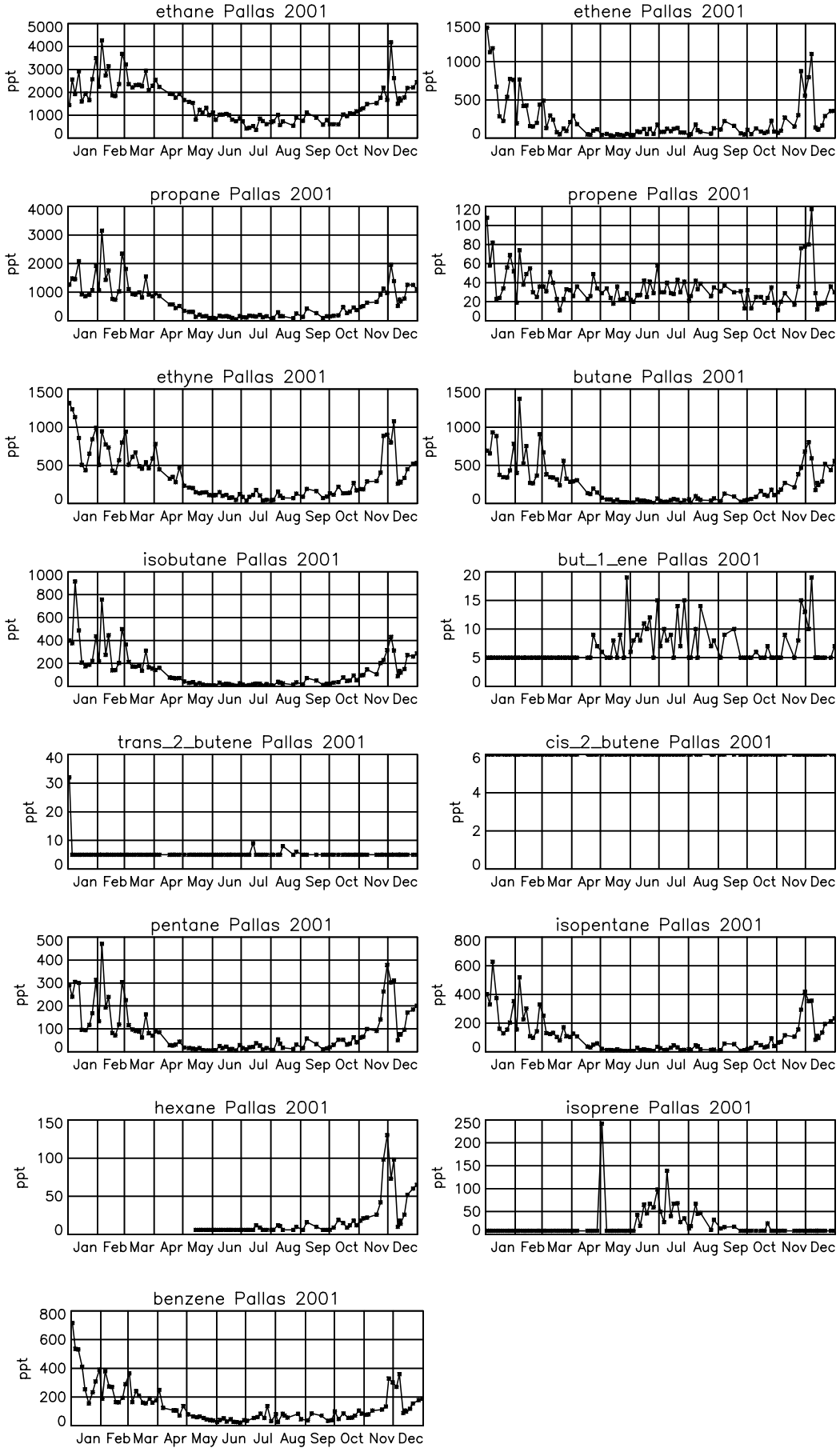
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.045	0.061	0.066	0.082	0.131	0.095	0.333	0.623	0.035	0.022	0.029	0.027
	0.040	0.060	0.060	0.080	0.130	0.095	0.310	0.640	0.040	0.020	0.030	0.020
Birkenes	0.054	0.050	0.042	0.038	0.076	0.165	0.140	0.056	0.032	0.042	0.031	0.032
	0.050	0.045	0.040	0.040	0.050	0.090	0.095	0.060	0.027	0.040	0.025	0.032
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-UBA	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-NILU	0.058	0.032	0.036	0.367	0.057	0.051	0.183	0.068	0.026	0.048	0.026	0.034
	0.060	0.035	0.040	0.020	0.050	0.045	0.060	0.060	0.030	0.045	0.030	0.040
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Brotjacklriegel	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	0.065	0.061	0.044	0.071	0.098	0.088	0.141	0.151	0.064	0.037	0.061	0.082
	0.070	0.060	0.030	0.060	0.080	0.085	0.090	0.120	0.065	0.037	0.055	0.050
Donon	0.051	0.022	0.030	0.037	0.098	0.101	0.106	0.132	0.079	0.077	0.050	0.046
	0.035	0.015	0.032	0.040	0.087	0.080	0.105	0.134	0.077	0.078	0.047	0.042

N2OXOPROPANAL

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Utö	0.153	0.148	0.205	0.242	0.242	0.290	0.356	0.133	0.087	0.058	0.018	0.037
	0.160	0.150	0.210	0.240	0.240	0.245	0.370	0.020	0.080	0.070	0.020	0.040
Birkenes	0.094	0.118	0.190	0.192	0.253	0.258	0.160	0.038	0.022	0.025	0.020	0.020
	0.090	0.115	0.180	0.170	0.230	0.280	0.110	0.030	0.020	0.030	0.020	0.020
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-UBA	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof-NILU	0.145	0.120	0.208	0.203	0.292	0.275	0.304	0.230	0.058	0.061	0.017	0.021
	0.120	0.115	0.220	0.160	0.320	0.250	0.140	0.150	0.045	0.060	0.020	0.020
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Brotjacklriegel	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	0.221	0.185	0.218	0.214	0.251	0.172	0.166	0.221	0.050	0.060	0.031	0.028
	0.180	0.140	0.200	0.230	0.290	0.100	0.130	0.200	0.030	0.060	0.030	0.020
Donon	0.020	0.014	0.014	0.015	0.049	0.089	0.073	0.024	0.023	0.017	0.016	0.015
	0.015	0.015	0.014	0.015	0.028	0.062	0.075	0.015	0.015	0.015	0.015	0.015

Appendix B

Time series of VOC measured in 2001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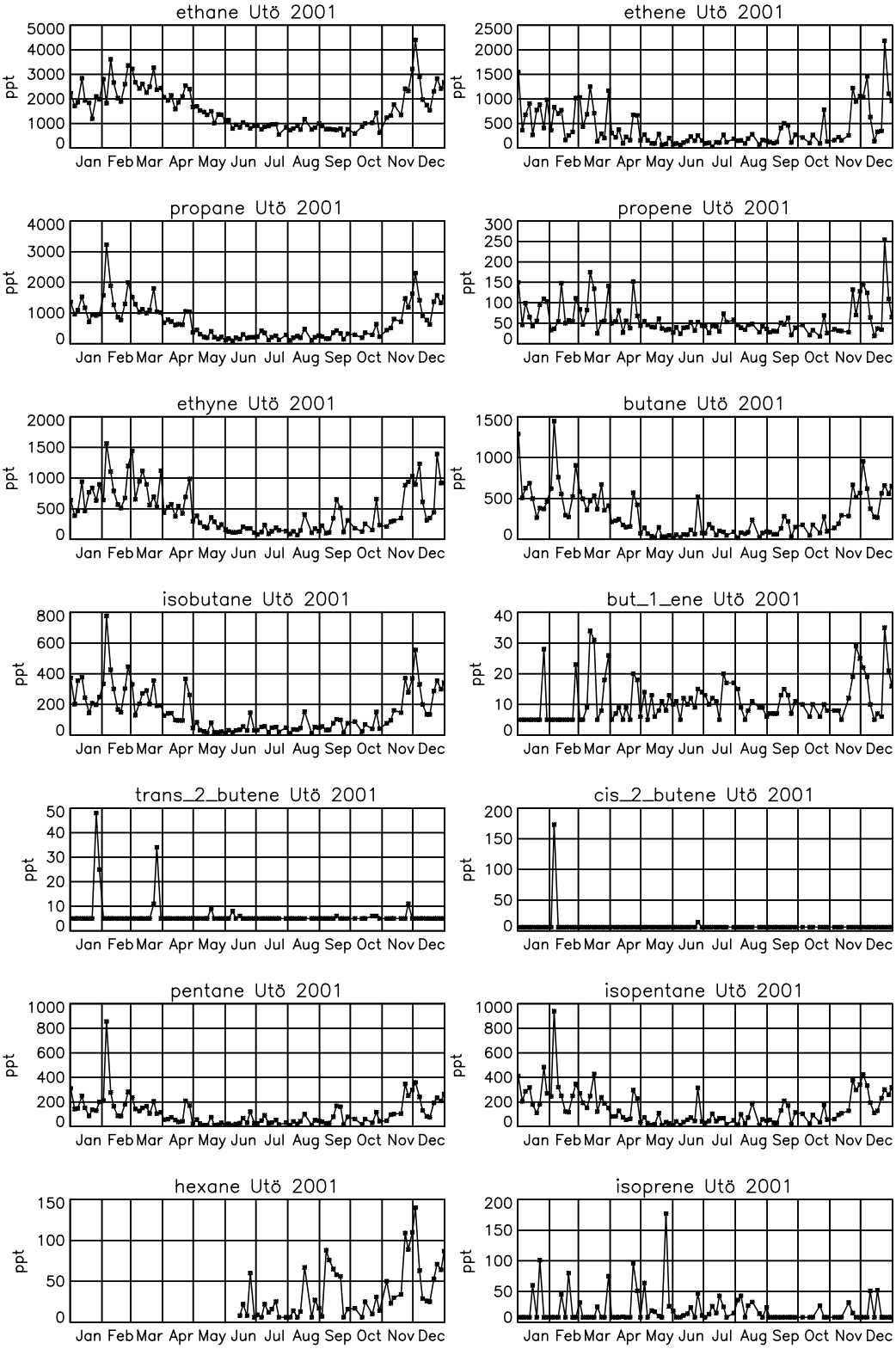
ethene Pallas 2001
propane Pallas 2001
propene Pallas 2001
ethyne Pallas 2001
butane Pallas 2001
isobutane Pallas 2001
but_1_ene Pallas 2001
trans_2_butene Pallas 2001
cis_2_butene Pallas 2001
pentane Pallas 2001
isopentane Pallas 2001
hexane Pallas 2001
isoprene Pallas 2001
benzene Pallas 2001
ppt
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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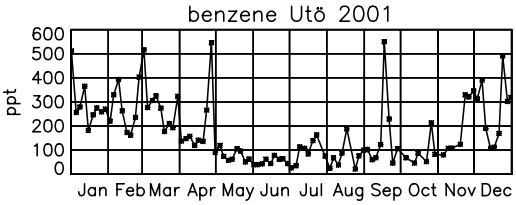
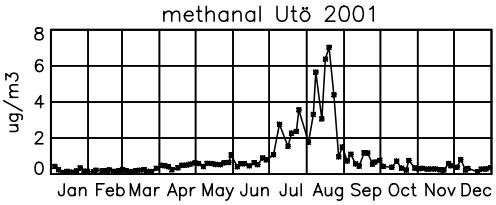
ethene Utö 2001
propane Utö 2001
propene Utö 2001
ethyne Utö 2001
butane Utö 2001
isobutane Utö 2001
but_1_ene Utö 2001
trans_2_butene Utö 2001
cis_2_butene Utö 2001
pentane Utö 2001
isopentane Utö 2001
hexane Utö 2001
isoprene Utö 2001
ppt
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec


benzene Utö 2001
ppt
600
500
400
300
200
100
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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8
6
4
2
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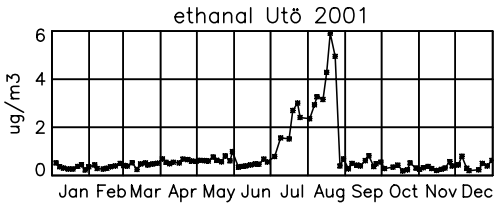
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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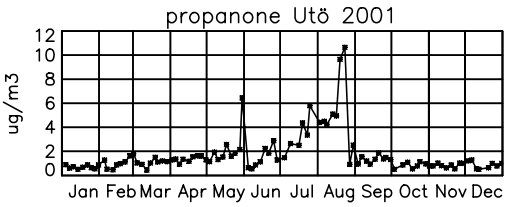
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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8
6
4
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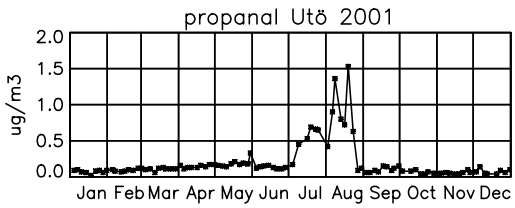
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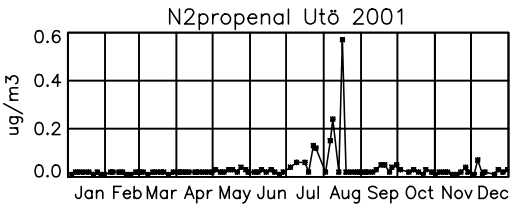
1.0
0.5
0.0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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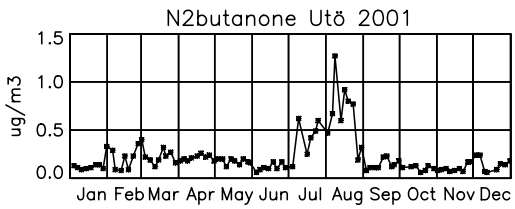
0.2
0.0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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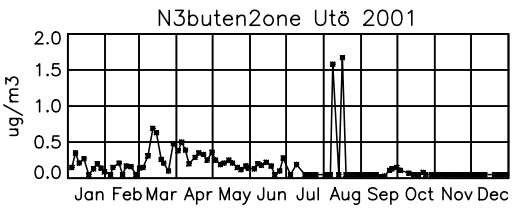
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ug/m3
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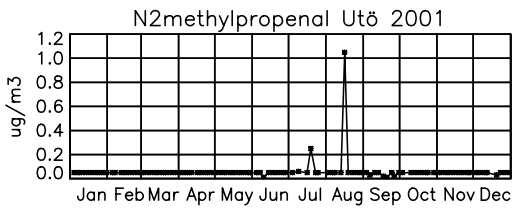
0.0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec


N2methylpropenal Utö 2001
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0.6
0.4
0.2
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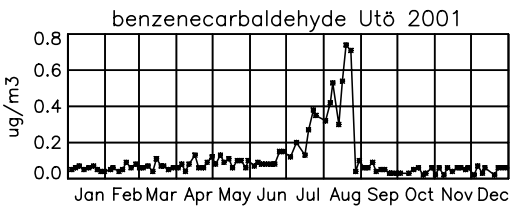
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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ug/m3
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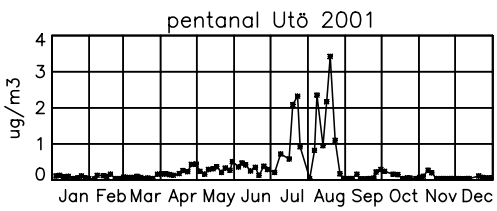
0.6
0.4
0.2
0.0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec


pentanal Utö 2001
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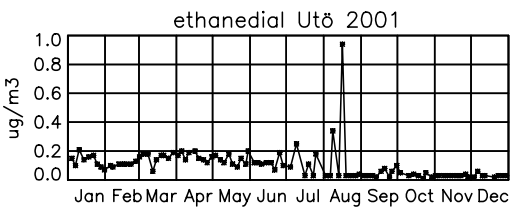
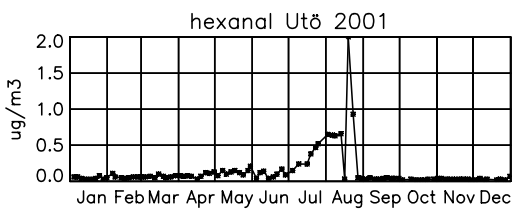
4
3
2
1
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec


ethanedial Utö 2001
ug/m3
1.0
0.8
0.6
0.4
0.2
0.0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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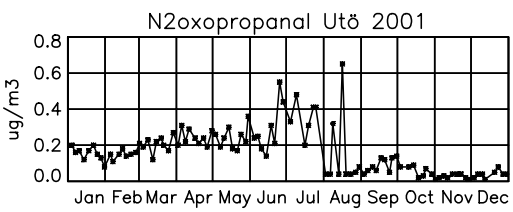
ug/m3
2.0
1.5
1.0
0.5
0.0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec


N2oxopropanal Utö 2001
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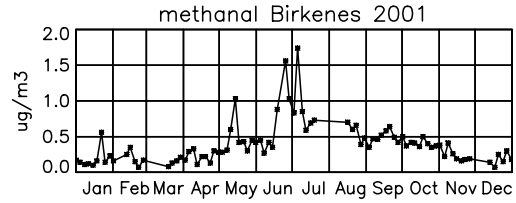
0.6
0.4
0.2
0.0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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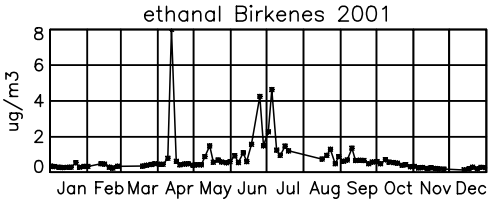
1.5
1.0
0.5
0.0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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8
6
4
2
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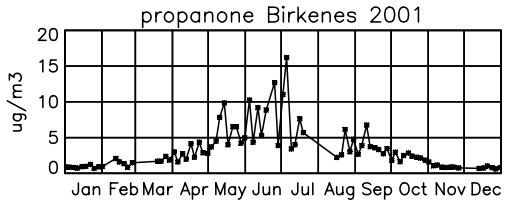
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10
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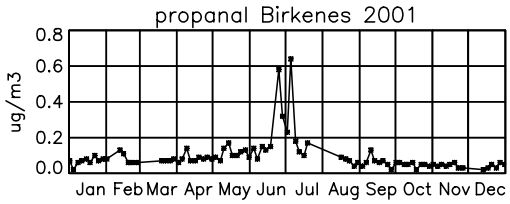
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0.2
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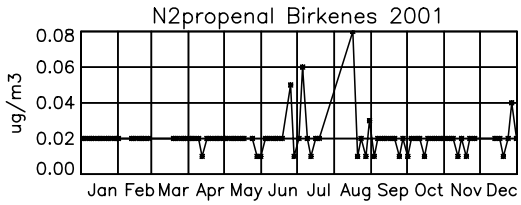
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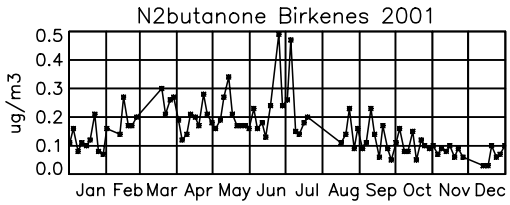
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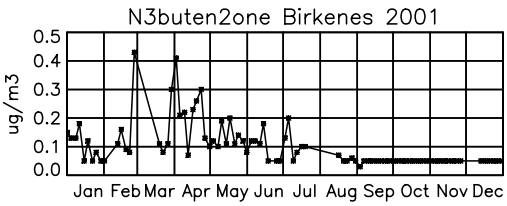
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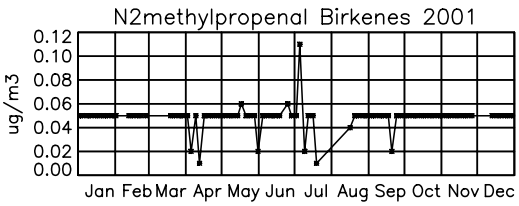
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0.02
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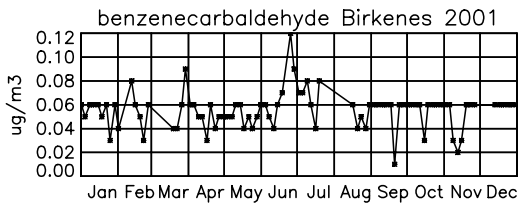
benzenecarbaldehyde Birkenes 2001
ug/m3
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0.04
0.02
0.00
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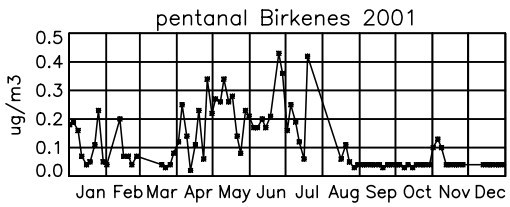
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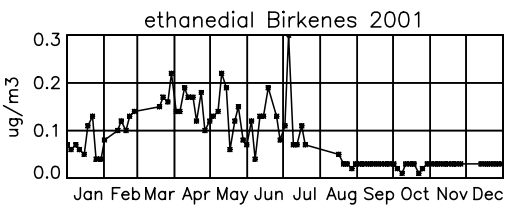
0.3
0.2
0.1
0.0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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0.1
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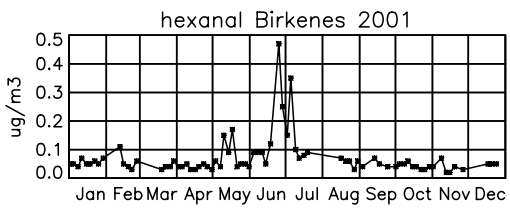
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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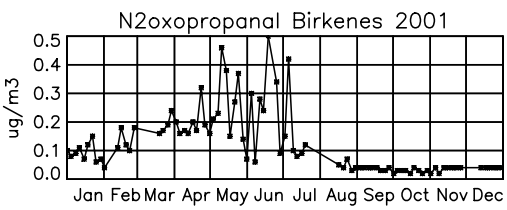
0.2
0.1
0.0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec


N2oxopropanal Birkenes 2001
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0.1
0.0
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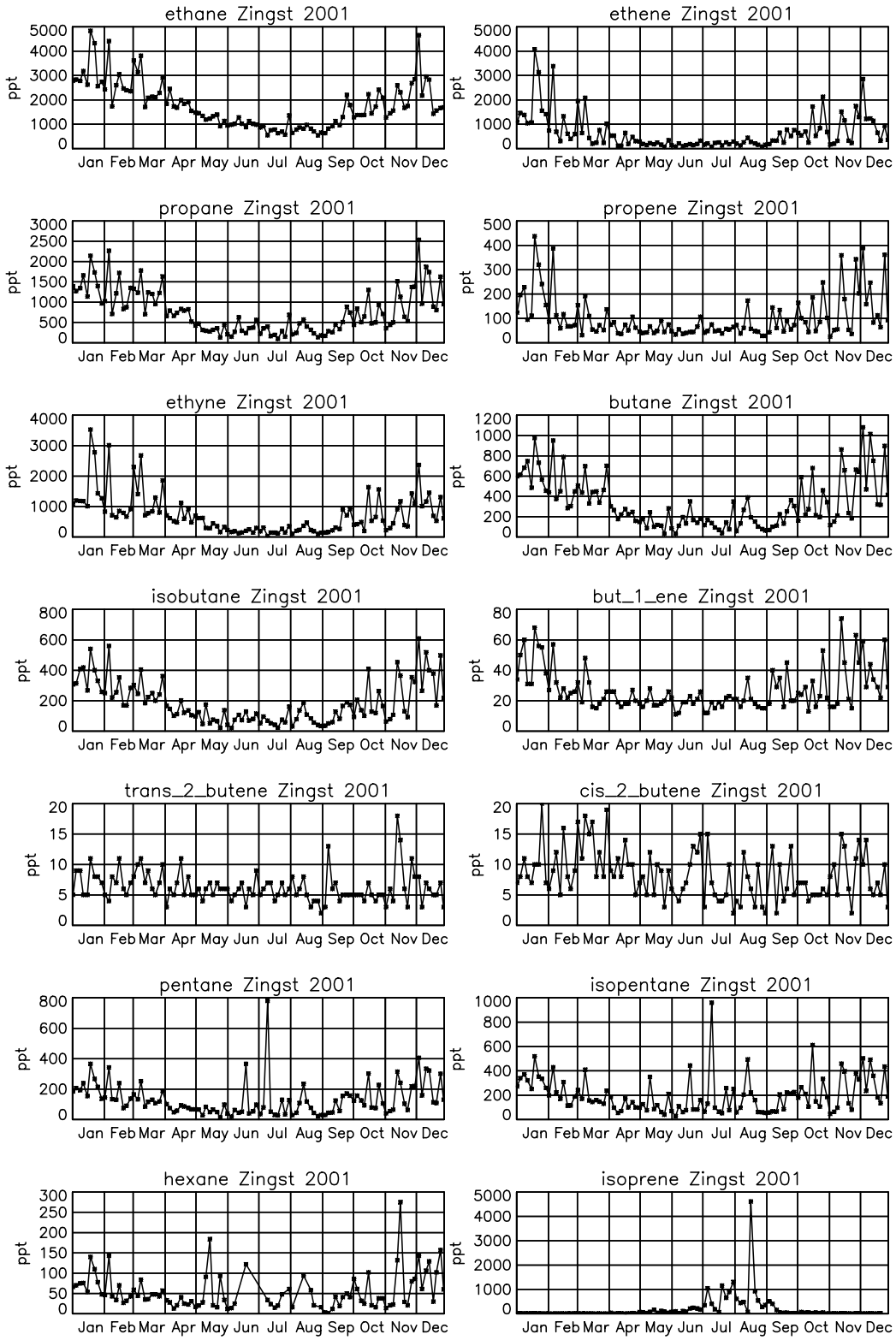
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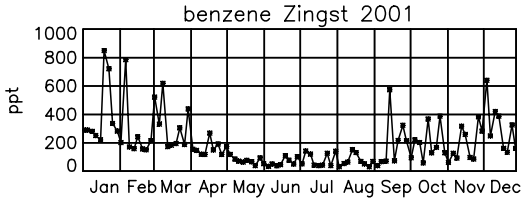
ethene Zingst 2001
propane Zingst 2001
propene Zingst 2001
ethyne Zingst 2001
butane Zingst 2001
isobutane Zingst 2001
but_1_ene Zingst 2001
trans_2_butene Zingst 2001
cis_2_butene Zingst 2001
pentane Zingst 2001
isopentane Zingst 2001
hexane Zingst 2001
isoprene Zingst 2001
ppt
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec


benzene Zingst 2001
ppt
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600
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200
0
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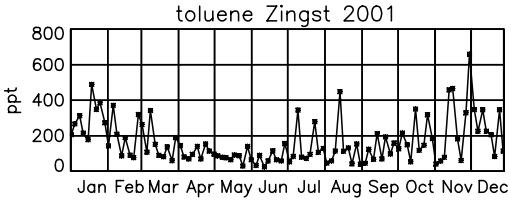
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ppt
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0
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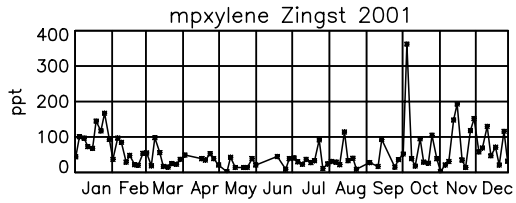
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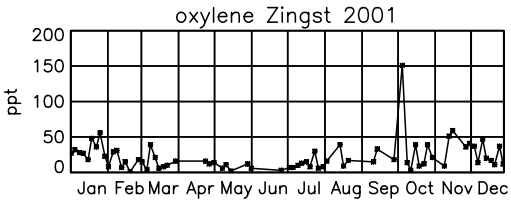
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200
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100
50
0
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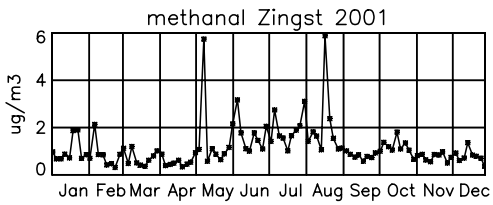
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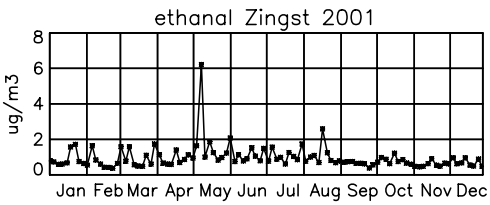
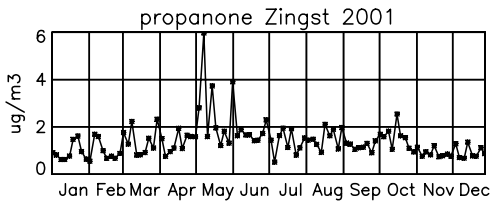
ug/m3
6
4
2
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec


ethanal Zingst 2001
ug/m3
8
6
4
2
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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ug/m3
6
4
2
0
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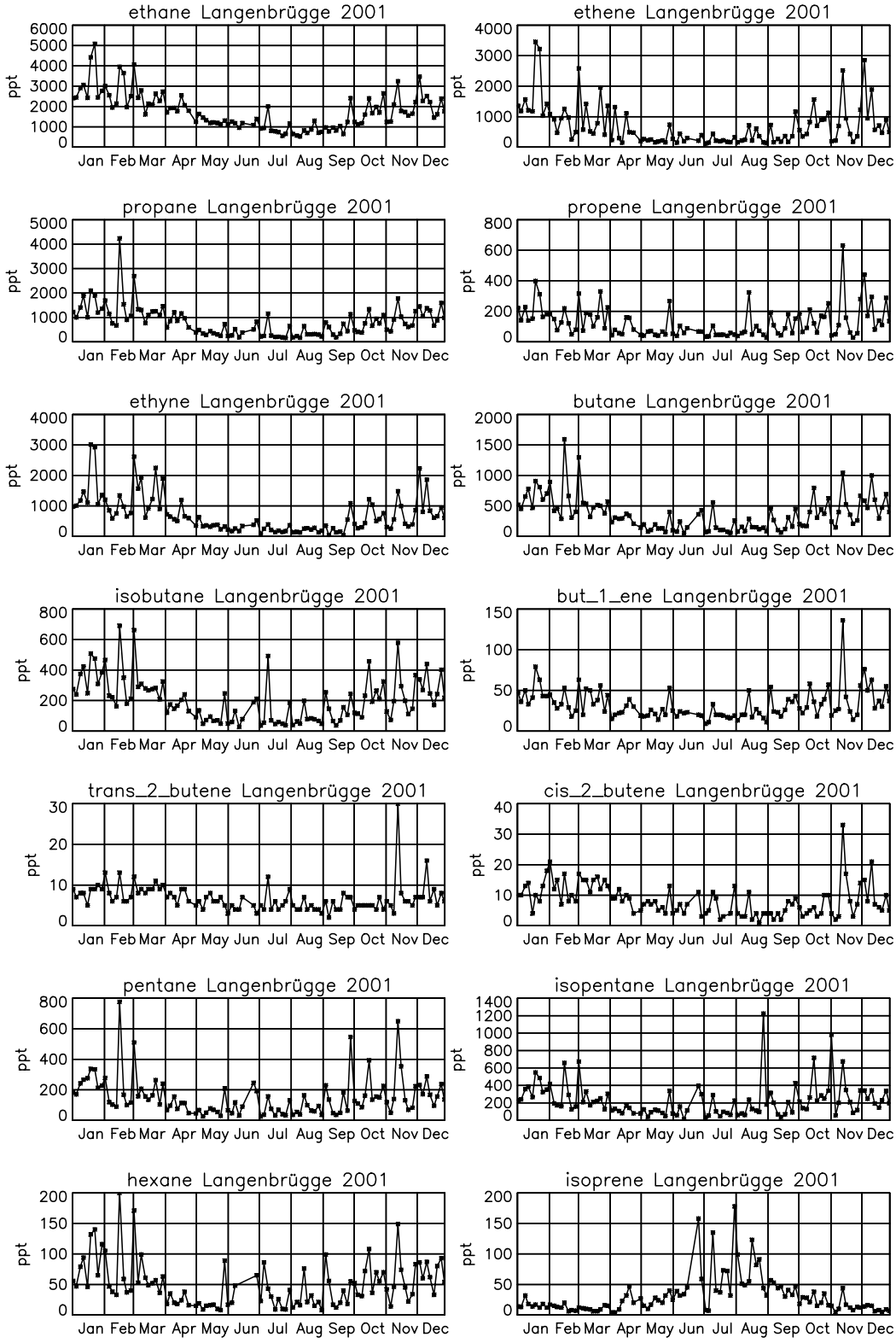
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ethene Langenbrügge 2001
propane Langenbrügge 2001
propene Langenbrügge 2001
ethyne Langenbrügge 2001
butane Langenbrügge 2001
isobutane Langenbrügge 2001
but_1_ene Langenbrügge 2001
trans_2_butene Langenbrügge 2001
cis_2_butene Langenbrügge 2001
pentane Langenbrügge 2001
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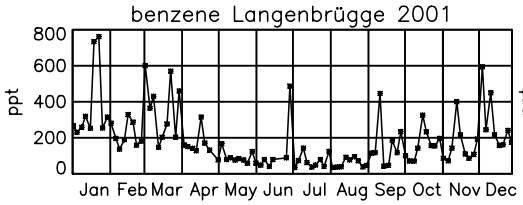
isoprene Langenbrügge 2001
ppt
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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ppt
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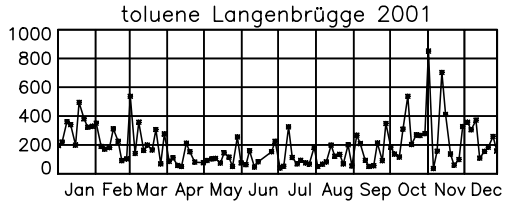
400
200
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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ppt
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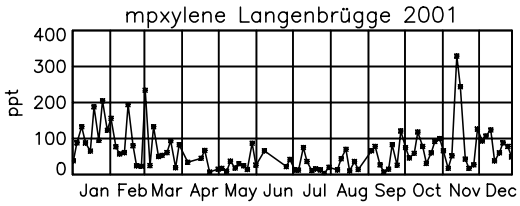
600
400
200
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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ppt
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200
100
0
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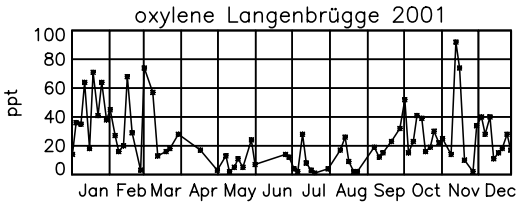
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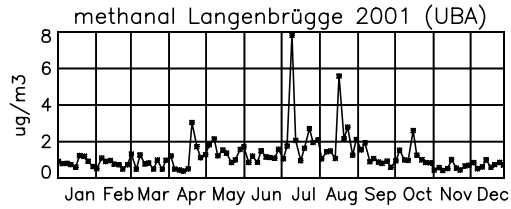
ppt
100
80
60
40
20
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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ug/m3
8
6
4
2
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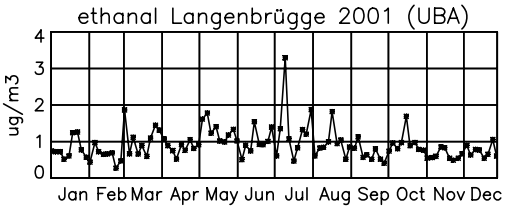
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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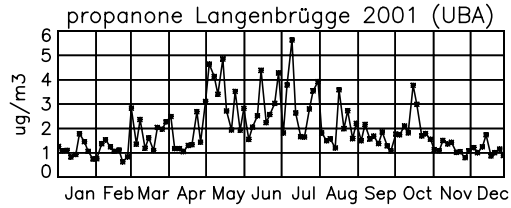
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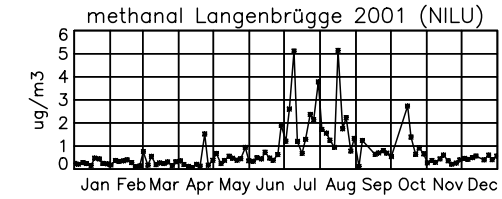
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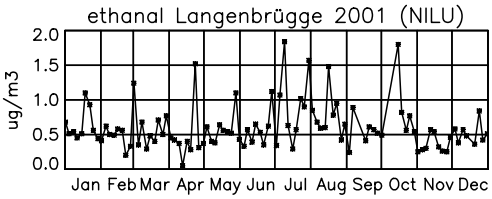
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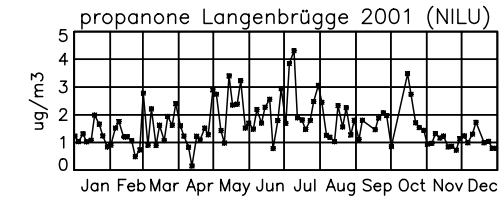
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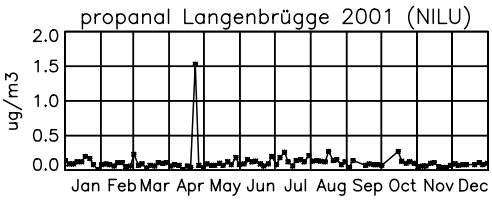
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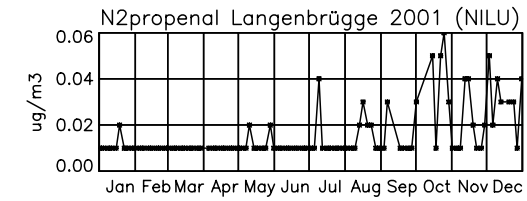
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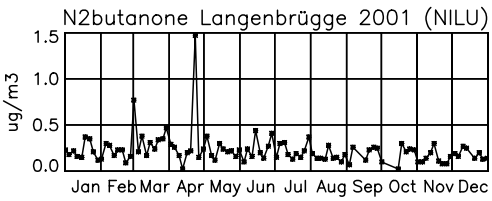
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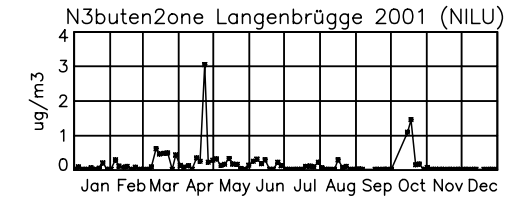
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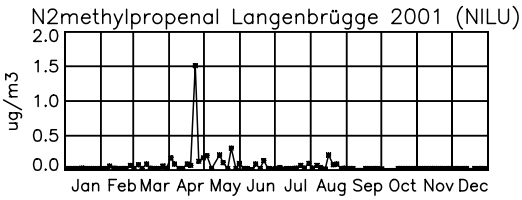
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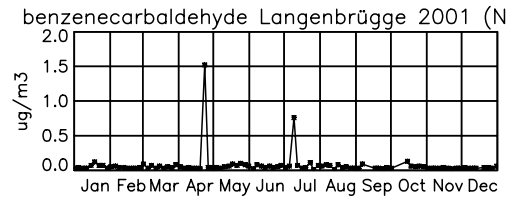
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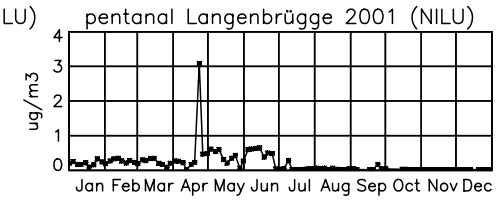
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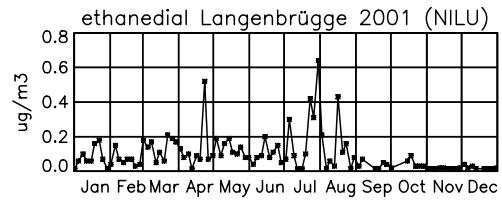
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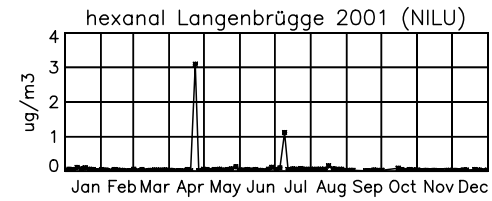
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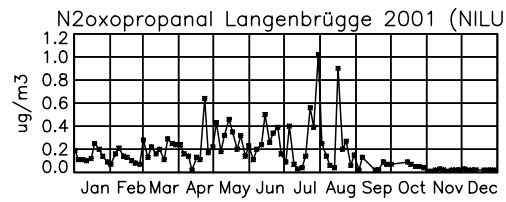
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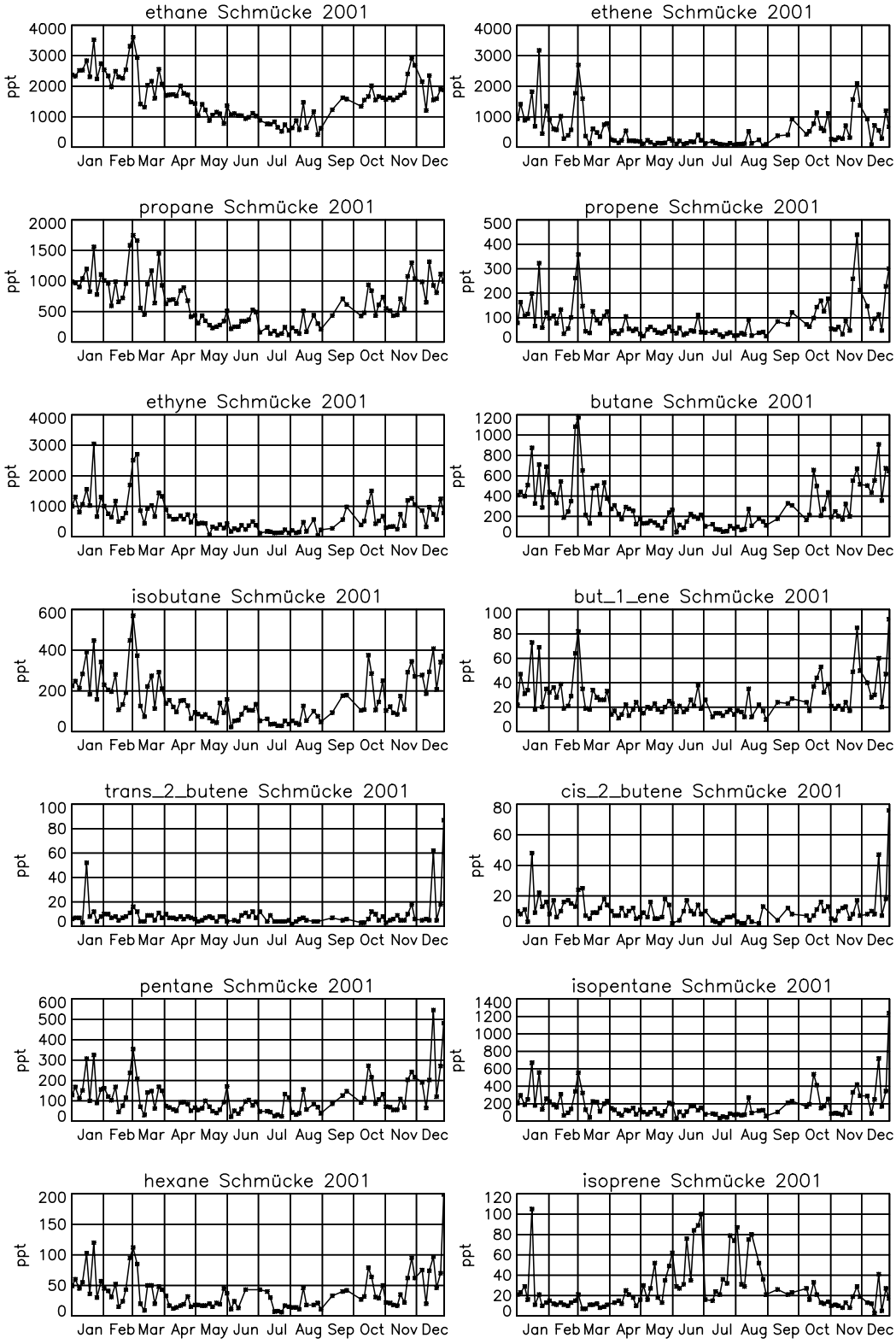
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ethyne Schmücke 2001
butane Schmücke 2001
isobutane Schmücke 2001
but_1_ene Schmücke 2001
trans_2_butene Schmücke 2001
cis_2_butene Schmücke 2001
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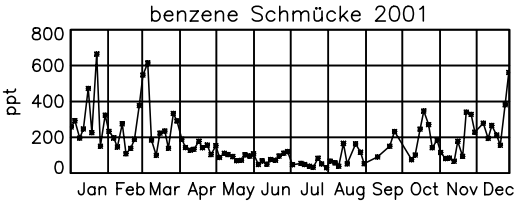
hexane Schmücke 2001
isoprene Schmücke 2001
ppt
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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ppt
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600
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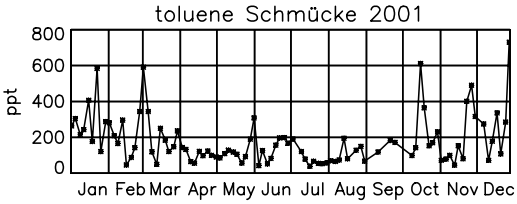
200
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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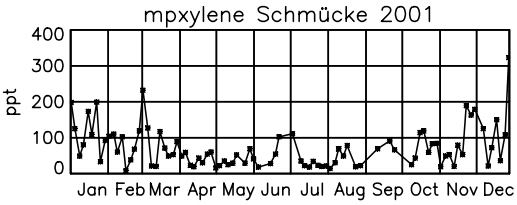
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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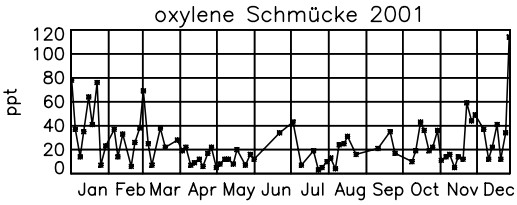
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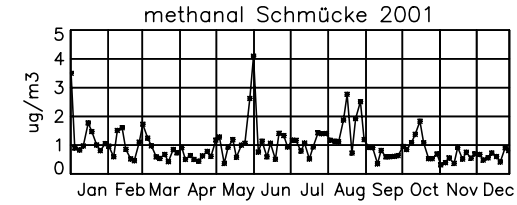
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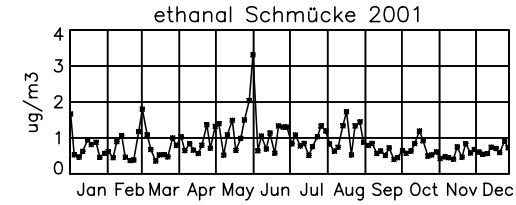
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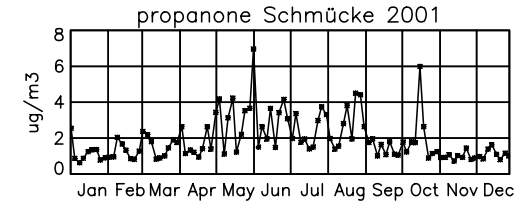
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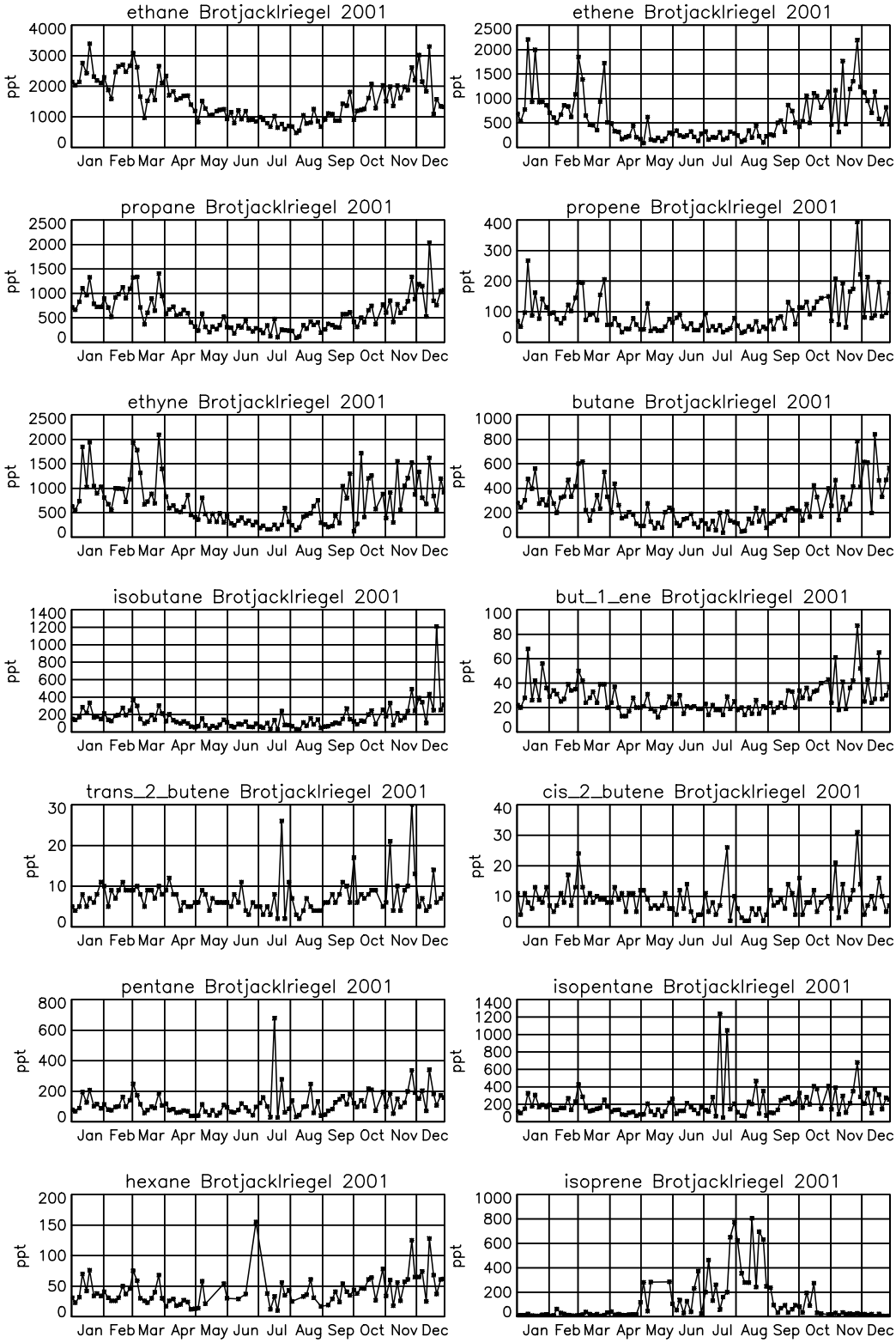
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propane Brotjacklriegel 2001
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ethyne Brotjacklriegel 2001
butane Brotjacklriegel 2001
isobutane Brotjacklriegel 2001
but_1_ene Brotjacklriegel 2001
trans_2_butene Brotjacklriegel 2001
cis_2_butene Brotjacklriegel 2001
pentane Brotjacklriegel 2001
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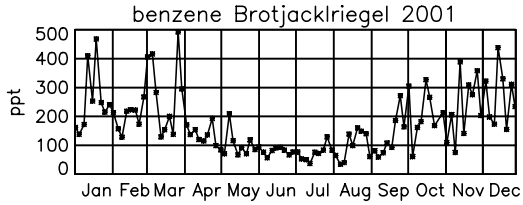
ppt
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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ppt
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300
400
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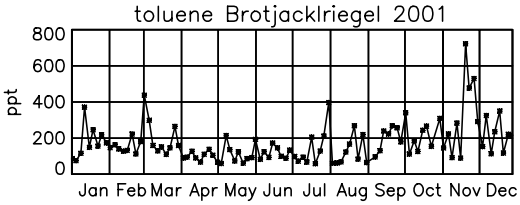
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ppt
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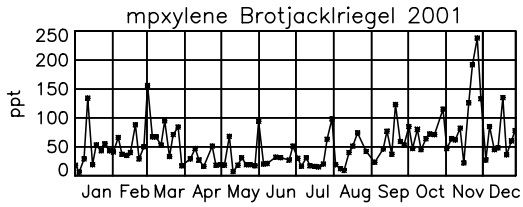
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ppt
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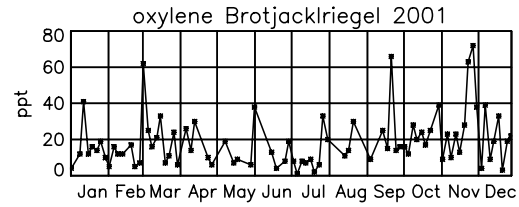
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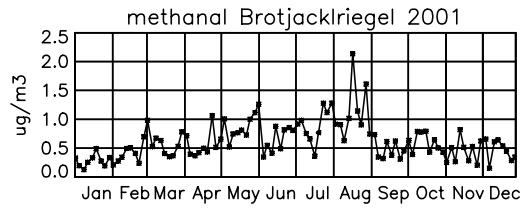
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1.5
2.0
2.5
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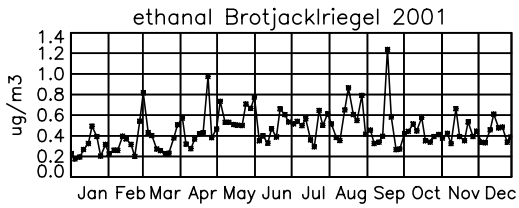
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1.2
1.4
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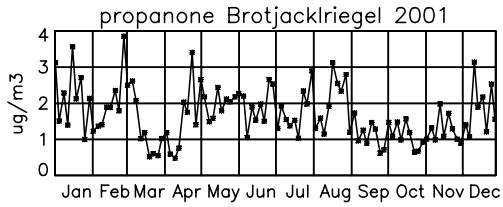
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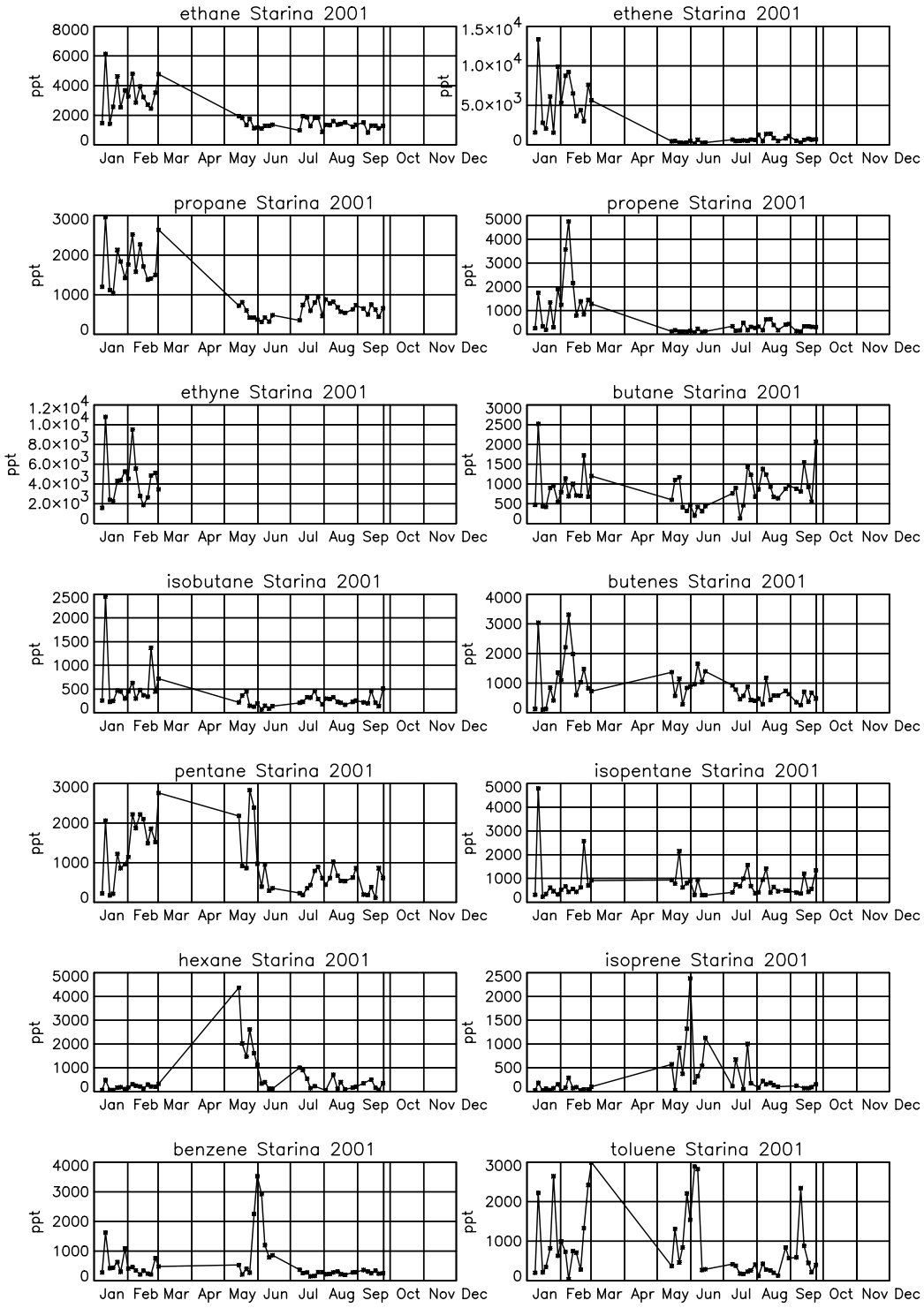
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butenes Starina 2001
pentane Starina 2001
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benzene Starina 2001
toluene Starina 2001
ppt
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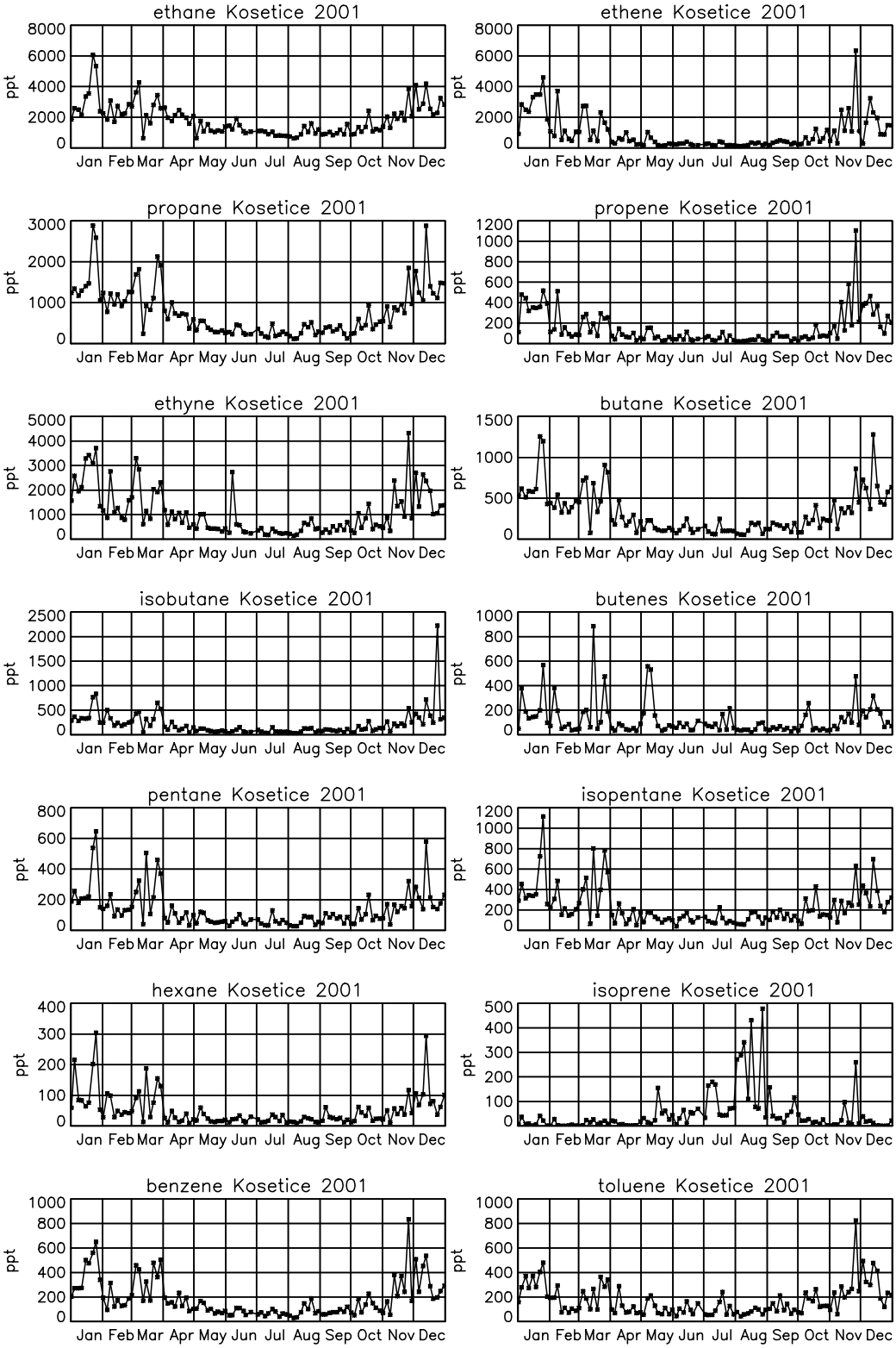
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ethyne Kosetice 2001
butane Kosetice 2001
isobutane Kosetice 2001
butenes Kosetice 2001
pentane Kosetice 2001
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benzene Kosetice 2001
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ppt
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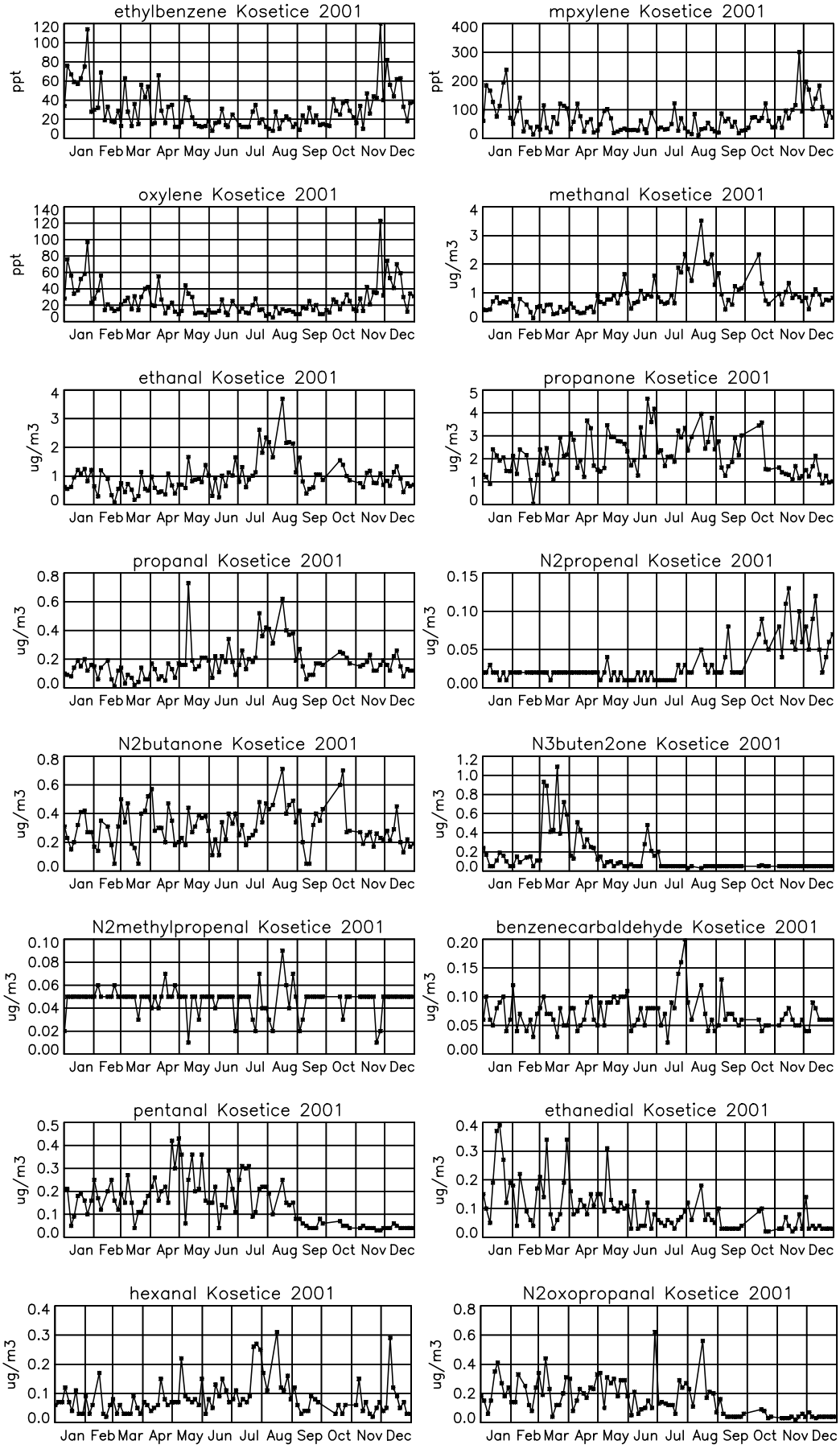
ethylbenzene Kosetice 2001
ppt
mpxylene Kosetice 2001
ppt
oxylene Kosetice 2001
ppt
methanal Kosetice 2001
ug/m3
ethanal Kosetice 2001
ug/m3
propanone Kosetice 2001
ug/m3
propanal Kosetice 2001
ug/m3
N2propenal Kosetice 2001
ug/m3
N2butanone Kosetice 2001
ug/m3
N3buten2one Kosetice 2001
ug/m3
N2methylpropenal Kosetice 2001
ug/m3
benzenecarbaldehyde Kosetice 2001
ug/m3
pentanal Kosetice 2001
ug/m3
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hexanal Kosetice 2001
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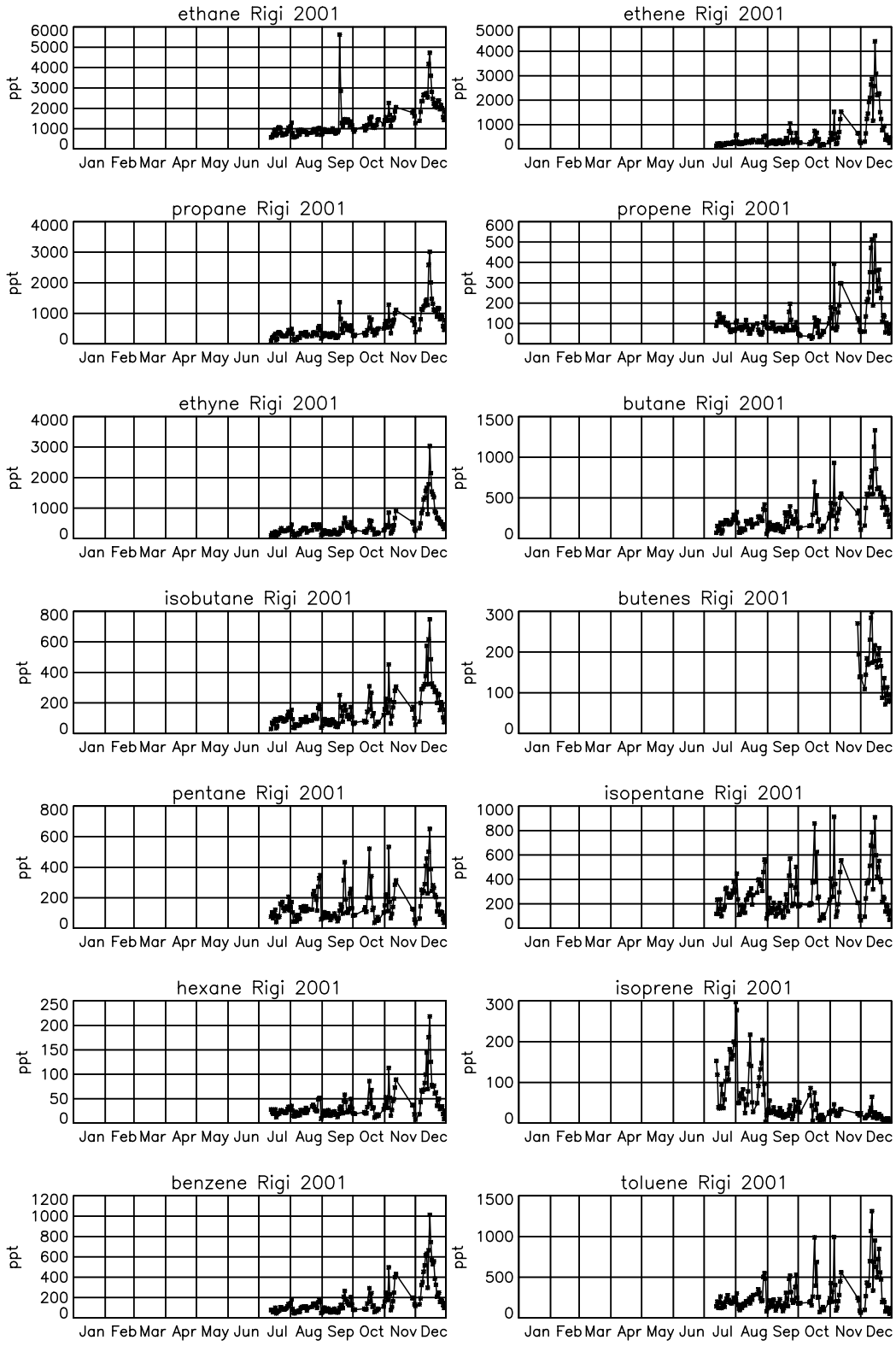
N2oxopropanal Kosetice 2001
ug/m3
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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propane Rigi 2001
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butenes Rigi 2001
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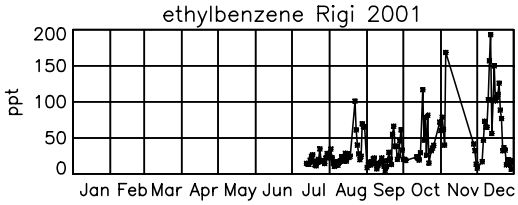
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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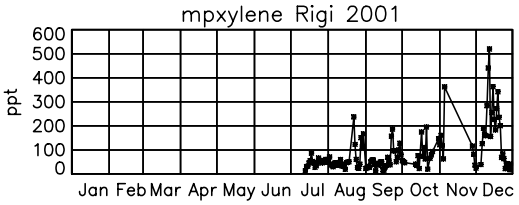
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ppt
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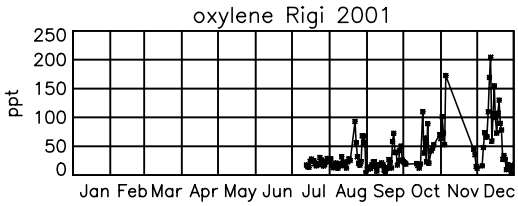
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ppt
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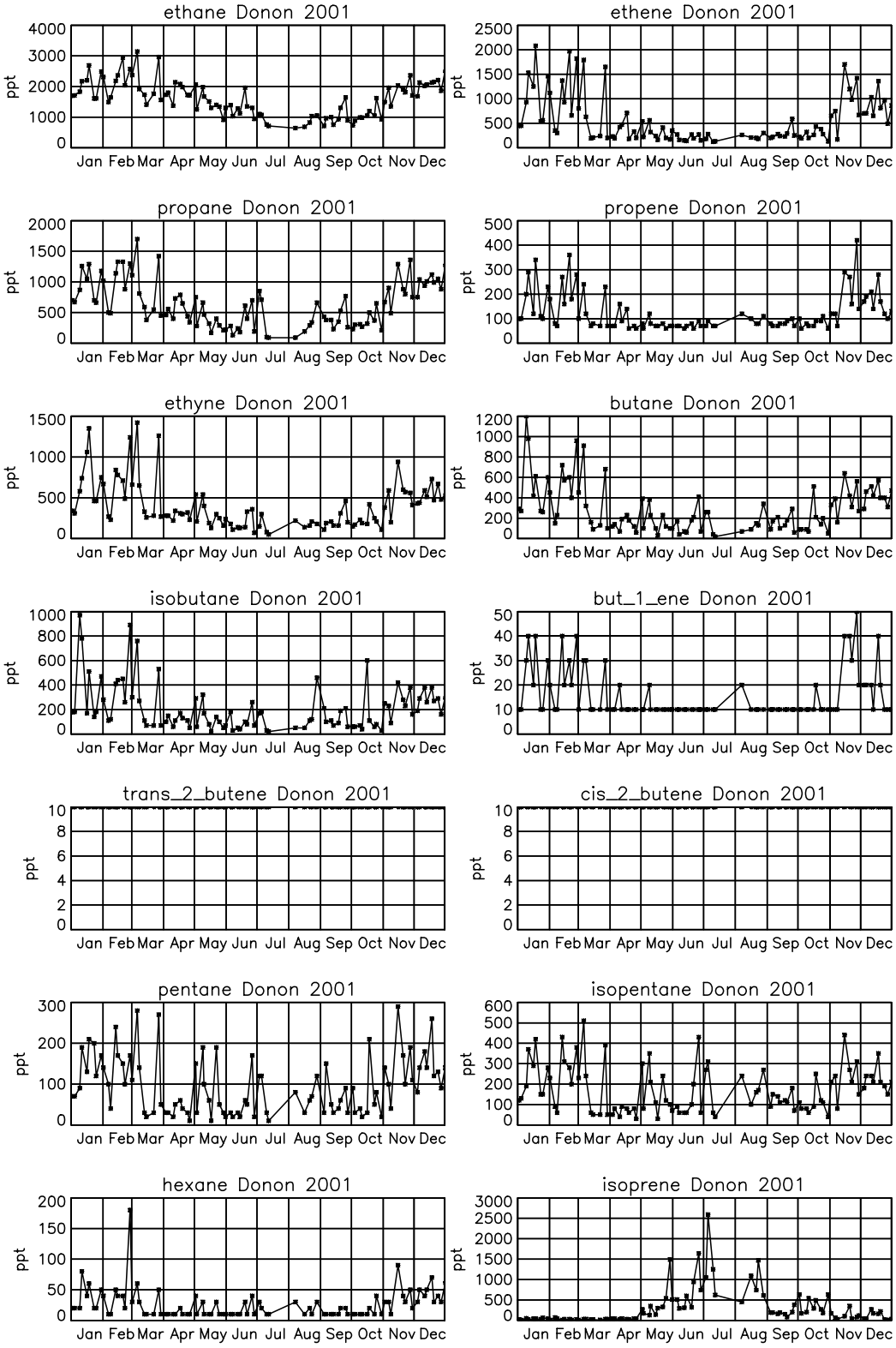
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ethene Donon 2001
propane Donon 2001
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but_1_ene Donon 2001
trans_2_butene Donon 2001
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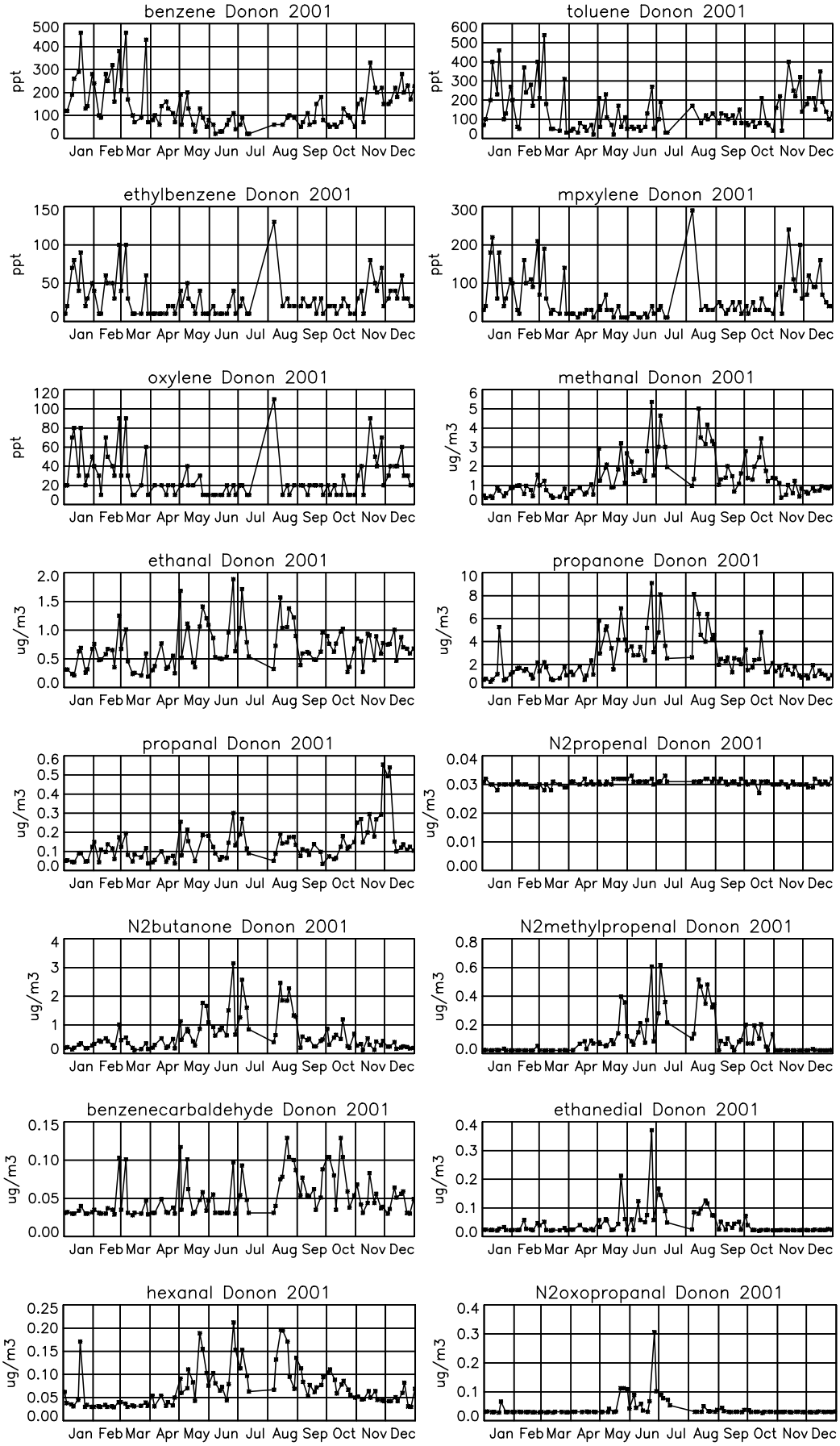
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ppt
toluene Donon 2001
ppt
ethylbenzene Donon 2001
ppt
mpxylene Donon 2001
ppt
oxylene Donon 2001
ppt
methanal Donon 2001
ug/m3
ethanal Donon 2001
ug/m3
propanone Donon 2001
ug/m3
propanal Donon 2001
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benzenecarbaldehyde Donon 2001
ug/m3
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ug/m3
hexanal Donon 2001
ug/m3
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ug/m3
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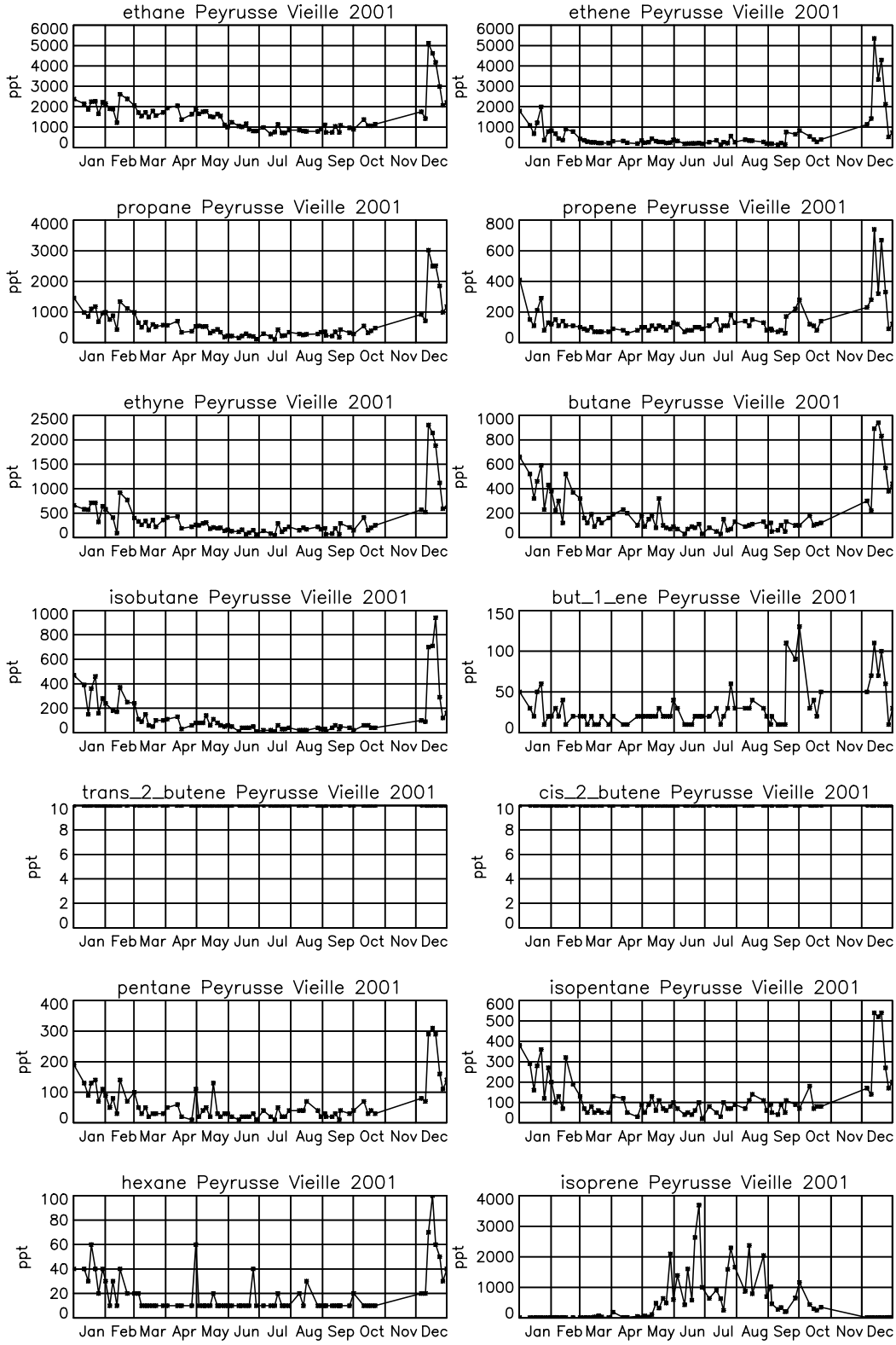
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ethyne Peyrusse Vieille 2001
butane Peyrusse Vieille 2001
isobutane Peyrusse Vieille 2001
but_1_ene Peyrusse Vieille 2001
trans_2_butene Peyrusse Vieille 2001
cis_2_butene Peyrusse Vieille 2001
pentane Peyrusse Vieille 2001
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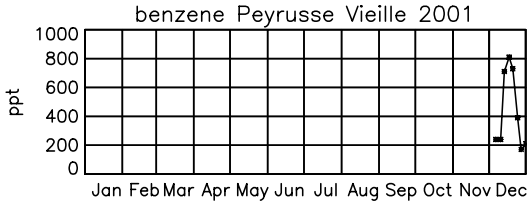
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ppt
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800
600
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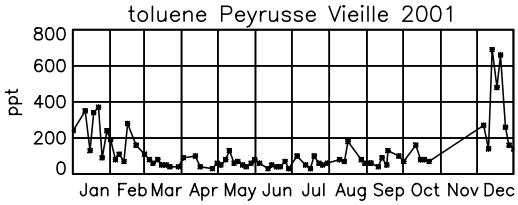
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ppt
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600
400
200
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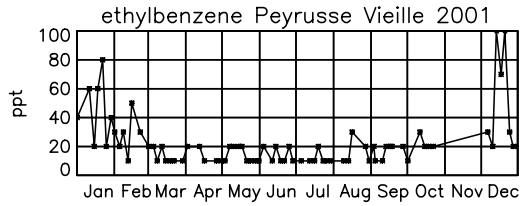
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ppt
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60
40
20
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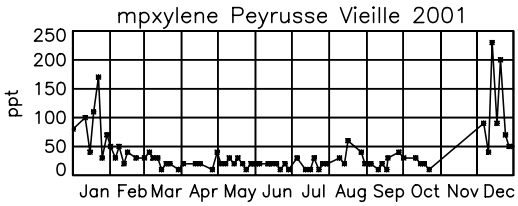
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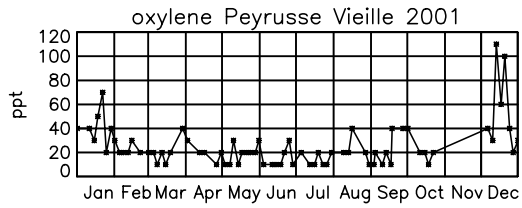
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ppt
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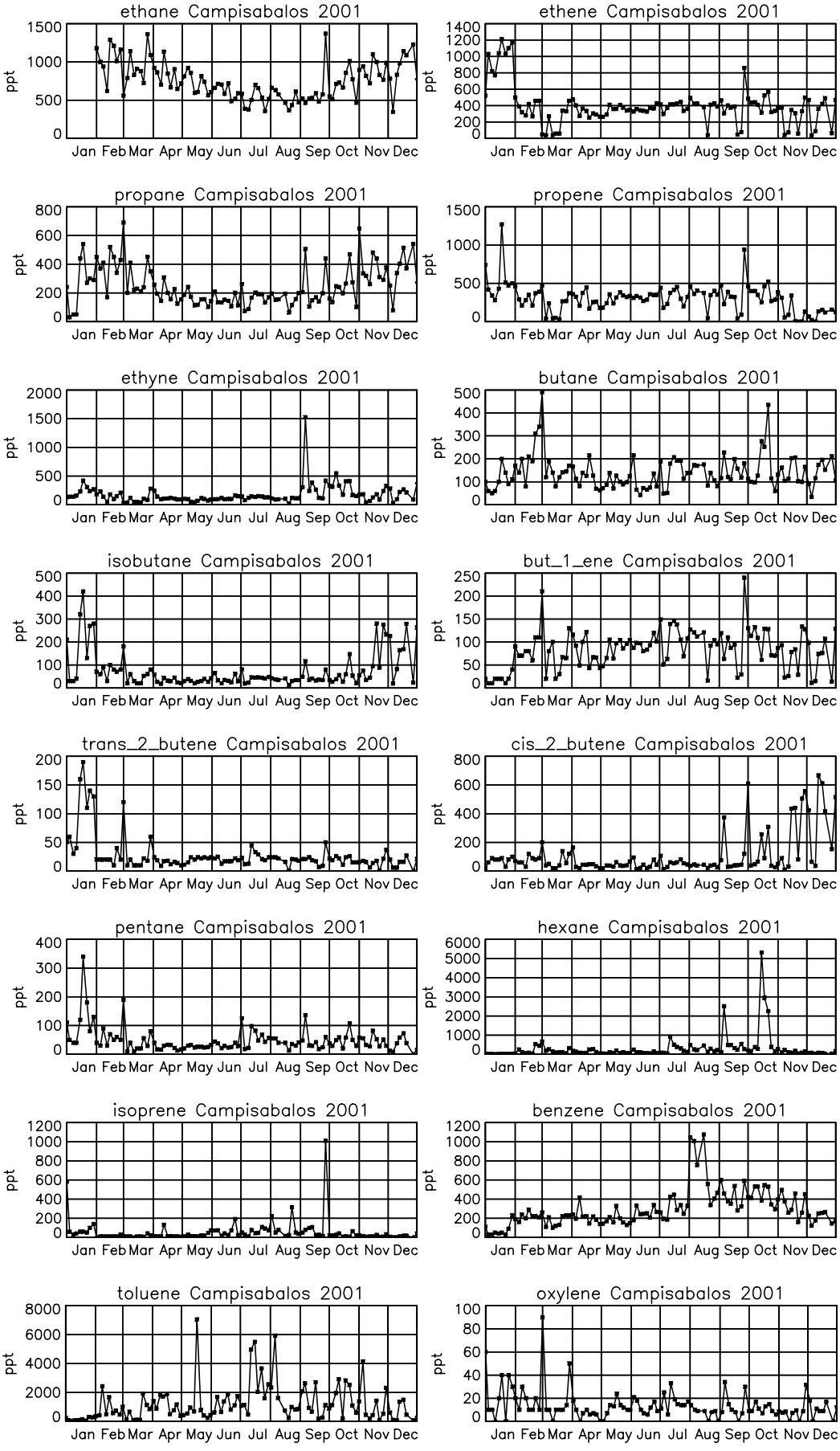
ethane Campisabalos 2001
ethene Campisabalos 2001
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butane Campisabalos 2001
isobutane Campisabalos 2001
but_1_ene Campisabalos 2001
trans_2_butene Campisabalos 2001
cis_2_butene Campisabalos 2001
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isoprene Campisabalos 2001
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toluene Campisabalos 2001
oxylene Campisabalos 2001
ppt
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec