EMEP/CCC-Report 4/2012

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

VOC measurements 2010

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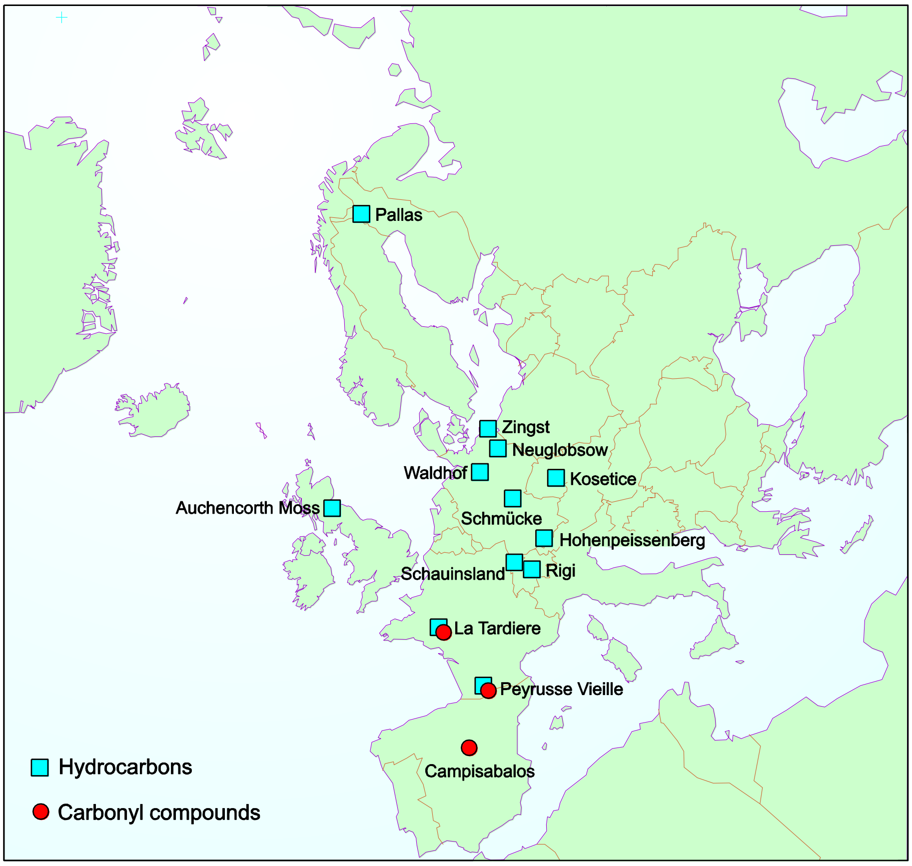

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Contents

Summary

This report presents measurements of VOC carried out during 2010 at EMEP monitoring sites. VOC measurements are reported for a total of 12 sites, and 2 of these with carbonyls. Except for three sites with continuous monitoring of hydrocarbons (Rigi, Hohenpeissenberg and Auchencorth Moss) all the VOC measurements are made by grab samples of light hydrocarbons in canisters and by 8-hours samples of carbonyls by DNPH adsorption tubes.

The monitoring network was increased by one station in 2010 – hydrocarbon data from Auchencorth Moss in Scotland were included in the EMEP data. Hydrocarbon data were also received from Kollumerward in the Netherlands, but they were considered to be to sparse to be included in the report.

The winter median concentration levels were highest at sites in Germany; Waldhof, Schmücke and Neuglobsow for many of the hydrocarbons. In general, however, fairly uniform mean concentration levels of alkanes were seen, indicating that these compounds become well mixed in the dark season without effective chemical loss mechanisms.

Long term trends are difficult to assess due to the large year-to-year variations. The data from the period 2007-2010 indicate increased winter concentrations of ethane, propane and butane at several sites. Also other species (e.g. iso-butane) showed elevated concentrations in winter 2010. Robust trend calculations of the VOCs are difficult to carry out due to the poor sampling frequency (normally 2 samples per week) and the strong influence of meteorology. Modelling studies are needed to separate the effect of changes in emissions from those of changing meteorology from year to year.

VOC measurements 2010

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 Gothenburg protocol to Abate Acidification, Eutrophication and Ground-level Ozone was adopted by the Executive Body of UN-ECE, and on the 17th May 2005 the Protocol entered into force. 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. According to the Protocol, 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 (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).

In the EU FP5 project AMOHA (Accurate Measurements of Hydrocarbons in the Atmosphere) a large number of laboratories in Europe participated in parallel sampling and analyses of hydrocarbons in ambient air (Slemr et al., 2002). A major part of the project was to organize four annual intercomparisons starting in 1997 and ending in 2000. The results showed that except for a few laboratories the agreement was within ±25% of the median for the lighter alkanes. For some aromats and unsaturated hydrocarbons as well as the C_6-C_7 alkanes a large spread in the values were seen, indicating measurement difficulties with these compounds. The spread in the results were, however, much less for laboratories using a NPL standard for calibration (Aas et al., 2001). Thus, it may be concluded that a large part of the differences seen among the laboratories reflected the use of different calibration gases. When using the same NPL standard the results from this intercomparison were very satisfactory.

The EMEP VOC 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, 2007). An EMEP expert meeting on VOC measurements was organised in Berlin, 1994 (EMEP/CCC, 1995a), 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; Borbon et al., 2004; Hakola et al., 2006).

An initiative has been taken to increase the cooperation and exchange of VOC data between GAW (Global Atmospheric Watch) and EMEP. At the EMEP TFMM workshop in Oslo in November 2004, on the implementation of the EMEP monitoring strategy, a closer harmonisation between the VOC monitoring in EMEP and GAW was discussed. Minutes and conclusions from the workshop is given elsewhere (EMEP/CCC, 2005). Harmonisation of data quality objectives (DQOs) and using a common audit questionnaire was recommended, and it is also a wish to arrange common GAW/EMEP training course and to further increase the exchange of VOC monitoring data between EMEP, GAW and WDCGG (World Data Centre of Greenhouse Gases).

In 2006 a WMO/GAW workshop on global measurements of VOCs (WMO, 2007) proposed a list of species to be measured based on current and future possibilities and needs of GAW. The proposed species are: Ethane, propane, acetylene, isoprene, formaldehyde, terpenes, acetonitrile, methanol, ethanol, acetone, DMS, benzene, toluene, iso- and n-butane, iso- and n-pentane. Most of these compounds are already part of the EMEP VOC programme with some exceptions. The alcohols (methanol and ethanol) are likely to become more important in the future due to increased use of biofuels in vehicles. Furthermore, terpenes are important as precursors for secondary organic aerosols. These compounds would be of interest to include in the EMEP monitoring as well, but require other sampling methods and instrumentations than presently used for the hydrocarbons and carbonyls.

In the new EMEP Monitoring Strategy for 2010-2019 (ECE/EB.AIR/GE.1/ 2009/15), which hydrocarbons and carbonyls to measure have not been specified, but it is clearly stated that it is necessary to harmonise with the WMO GAW programme.

In April 2011 the project ACTRIS (Aerosols, Clouds, and Trace gases Research InfraStructure Network) was initiated. This is a European Project (EC 7th Framework Programme) aiming at integrating European ground-based stations equipped with advanced atmospheric probing instrumentation for aerosols, clouds, and short-lived gas-phase species. ACTRIS will have the essential role to support building of new knowledge as well as policy issues on climate change, air quality, and long-range transport of pollutants. WP4 in ACTRIS is dedicated to the measurements of VOCs and nitrogen oxides. The aim is to integrate and harmonise such trace gas measurements in Europe. The development of standardised measurement protocols (SOPs) and common European calibration scales for VOCs is a central issue. Furthermore, ACTRIS will foster the dissemination of the methods and quality assured data to scientific groups related to the analysis and modelling of air pollutants in Europe and to support EC directives relevant for air pollution and the CLRTAP abatement strategies.

2. Status of the measurement programme in 2010

2.1 The station network

The location of the monitoring sites for VOC presented in this report is shown in Figure 1 and an overview of the measurement programme and the responsible laboratories in 2010 is given in Table 2. Totally 14 measurement sites reported VOC data to CCC in 2010. The data from Kollumerward (NL09) were rather sparse and were thus not included in this report. Data for both hydrocarbons and carbonyls were reported from the site Campisábalos (ES09) but the data indicated technical or analytical problems and had to be discarded. Thus, the report includes a total of 12 sites and only 2 of them with carbonyl data, both of them in France.

Table 3 gives the number of valid (daily) samples of hydrocarbons and carbonyls (after inspection and removal of outliers). According to EMEP's recommendations, the samples should be taken at least 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, 1995b). The data capture for hydrocarbons was lower than this for many sites in 2010. La Tardière in France and all the German sites had a data capture below the quality objective. Hohenpeissenberg, Rigi and Auchencorth Moss have continuous sampling and thus a much higher data capture than the other sites. Carbonyls are only measured once per week in France giving a data capture of the order of 50%.

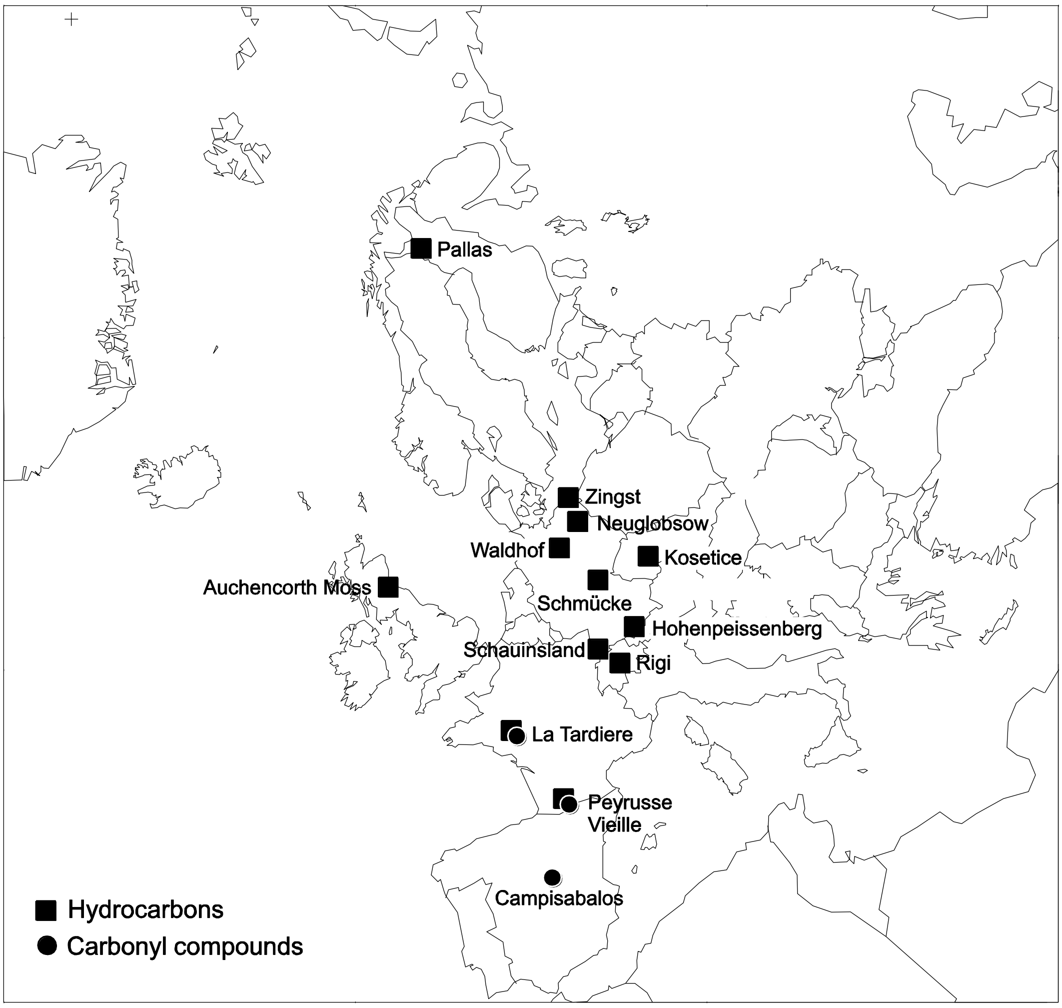

Figure 1: Monitoring sites for VOC in 2010.

Table 2: Status of the VOC monitoring programme in 2010. 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.

Station	Code	HC[1]	Lab.[2]	Carb[1]	Lab.[2]
Pallas	FI96	Reg.	FMI	n.m.	-
Auchencorth Moss	GB48	Cont.	CEH	n.m.	-
Waldhof	DE02	Reg.	UBA	n.m.	-
Schauinsland	DE03	Reg.	UBA	n.m.	-
Neuglobsow	DE07	Reg.	UBA	n.m.	-
Schmücke	DE08	Reg.	UBA	n.m.	-
Zingst	DE09	Reg.	UBA	n.m.	-
Hohenpeissenberg	DE43	Daily	DWD	n.m.	-
Košetice	CZ03	Reg.	CHMI	n.m.	-
Rigi	CH05	Cont.	EMPA	n.m.	-
Peyrusse Vieille	FR13	Reg.	EMD	Reg.	EMD
La Tardière	FR15	Reg.	EMD	Reg.	EMD
Campisábalos	ES09	(Reg.)[3]	MMA	(Reg.)[3]	MMA

1) Reg. = regularly, Scat. = scattered, n.m. = not measured., n.a. = not yet analysed, cont. = Continuous
2) CEH = Centre for Ecology and Hydrology, Scotland
CHMI = Czech Hydrometeorological Institute
DWD = Deutscher Wetterdienst
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)
UBA = Umweltbundesamt (Germany)
3) Data reported but discarded due to technical or analytical problems

Table 3: The number of valid samples of hydrocarbons (HC) and carbonyls (Carb) in 2010.

Station	Number of samples HC[2]	Carb[3]
Pallas	98	-
Auchencorth Moss[1]	324	-
Waldhof	82	-
Schauinsland	64	-
Neuglobsow	86	-
Schmücke	80	-
Zingst	86	-
Hohenpeissenberg[1]	350	-
Košetice	102	-
Rigi[1]	360	-
Peyrusse Vieille	95	51
La Tardière	79	51
Campisábalos	0	0

1) Refers to days with monitoring data
2) Refers to ethane (may differ for other HCs)
3) Refers to formaldehyde (may differ for other carbonyls)

2.2 Analytical procedures and quality control

The procedures for sampling and chemical analyses were similar in 2010 as in previous years, and are not discussed in this report. The technical procedures for the sampling and analysis of hydrocarbons by FMI at the Finnish station, 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), EMPA (Switzerland), CHMI (Czech Republic), MMA (Spain) and UBA (Germany) has been given in previous annual reports and by Solberg et al. (1996) and is not repeated here. A new GC and new analytical methods were introduced by UBA for the German sites in 2006 leading to certain systematic changes. In general, the new method was more sensitive to C_7 and higher VOCs. The instrumentation and methods applied by DWD at Hohenpeissenberg have been successfully tested in two international intercomparison experiments (NOMHICE, AMOHA) and have been documented by Plass-Dülmer et al. (2002).

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, 1995b) 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.

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 these carbonyls is needed.

Light hydrocarbon measurements from an automated on-line system at Auchencorth Moss in Scotland (Cape et al., 2012) were included in the report for the first time. The station is influenced by several regional sources: The city of Edinburgh 20 km to the north, an oil refinery (Grangemouth) 40 km to the northeast and Mossmorran, a gas processing plant 35 km to the north. A gas transfer facility for shipping in the River Forth, in the same direction as Mossmorran, could have leaks of propane. The unfiltered raw data thus show a number of very high spikes. A screening of all data based on wind speed and propane (propane < 3 ppbv), has however shown to be a simple and effective way of sorting out the extreme episodes (N. Cape, pers. comm) and was thus applied to all components for 2010 shown in this report.

3. VOC concentrations in 2010

3.1 General

Monthly mean and median concentrations of the individual hydrocarbons and carbonyls for 2010 are tabulated in Appendix A. The monthly statistics were not calculated for sample numbers less than four. Time series of all compounds during 2010 are given in Appendix B. Note that the monthly means and medians in Appendix A were based on all data whereas the time series in Appendix B were based on daytime values for the sites with continuous monitoring (Rigi, Hohenpeissenberg and Auchencorth Moss). Based on previous experience there is not much difference in the anthropogenic HC concentrations at noon and at midnight at Hohenpeissenberg (pers. comm., Christian Plass-Dülmer). For isoprene the difference is substantial as this is a reactive biogenic compound, emitted during daytime, with low concentrations during night.

A comparison of the seasonal mean and percentile concentrations of hydrocarbons in winter (Jan., Feb., Nov., Dec.) and carbonyls in summer (May, Jun., Jul., Aug.) measured at the different stations is given in Figure 2 and Figure 3. The stations are arranged from north to south. Considering that the sites span a wide area from Southern Europe to the most northern part of the continent, the hydrocarbon winter mean levels are fairly uniform. Lowest levels are seen at Pallas in N-Finland and at Auchencorth Moss in Scotland.

The carbonyl monitoring has been substantially reduced the latest years and was carried out only at two sites in France in 2010. At these sites the sampling frequency is once per week, making the seasonal statistics more uncertain.

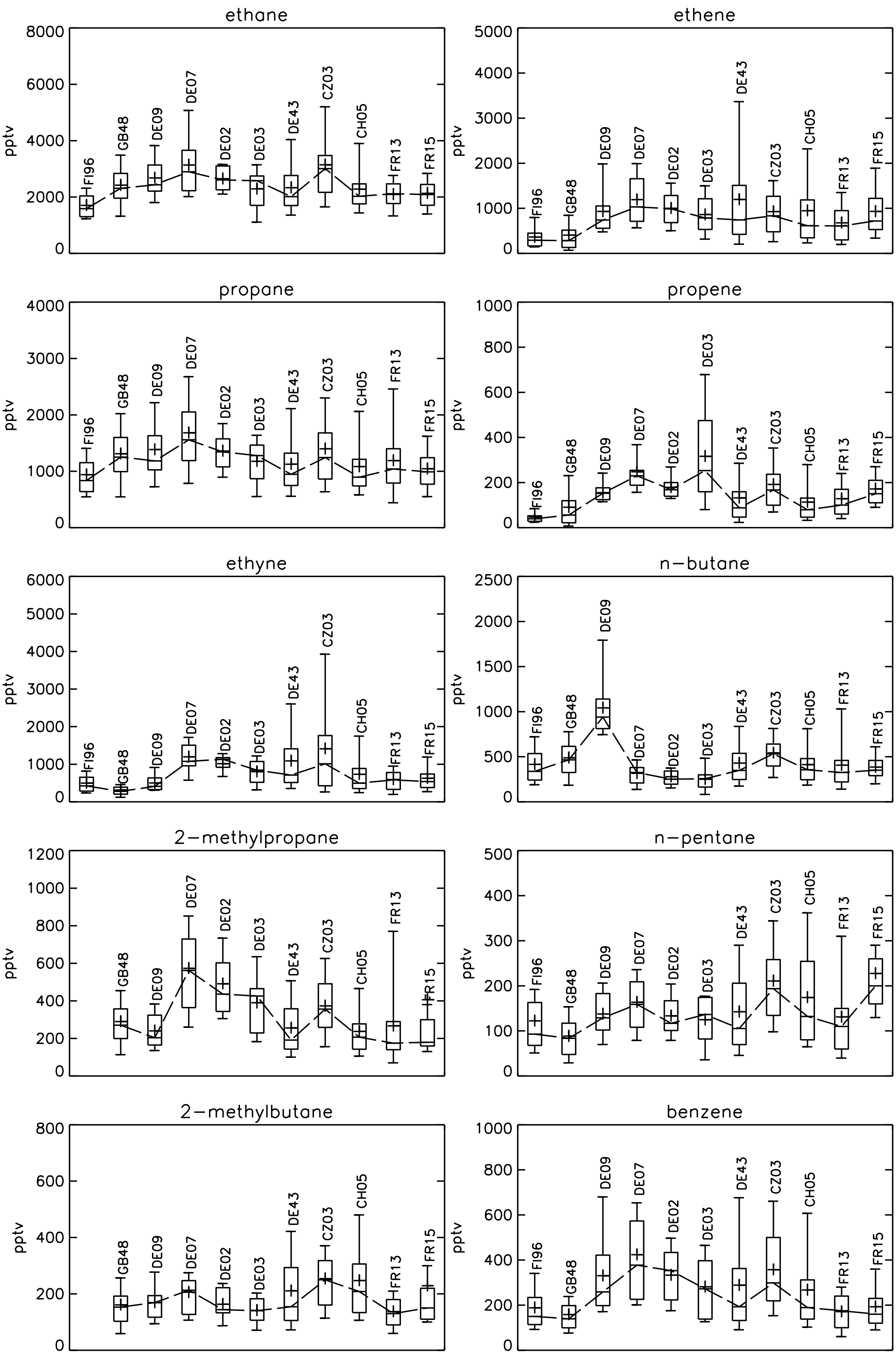

Figure 2: Box- and whisker-diagrams for hydrocarbons during winter 2010 (Jan., Feb., Nov., Dec.). The markers indicate the 10-, 25-, 50-, 75- and 90-percentiles. Mean values are indicated by a cross. The dashed line connects the median values for clarity.

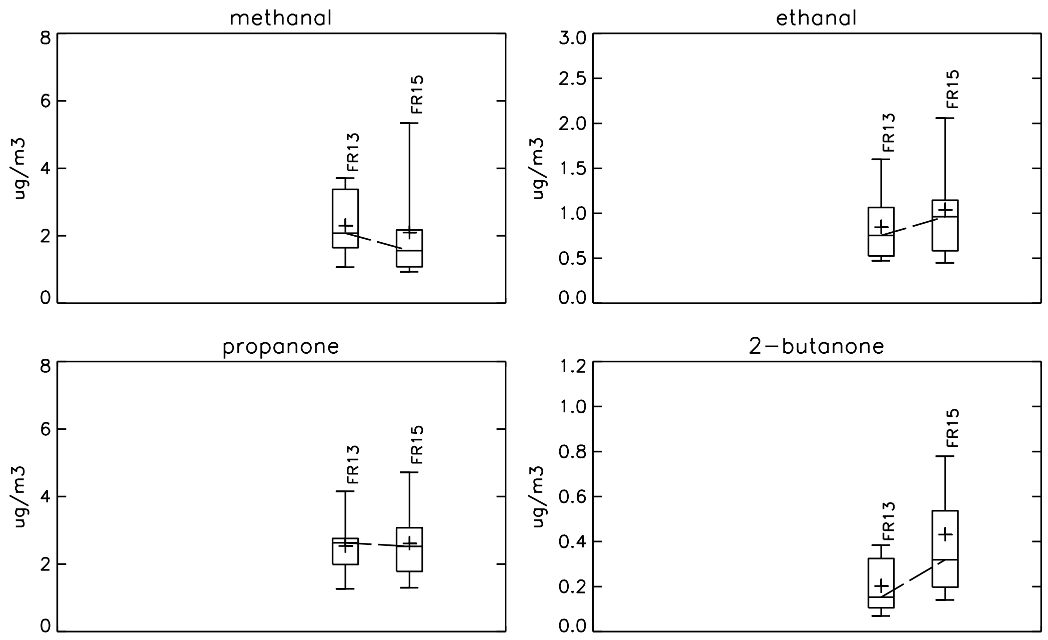

Figure 3: Box- and whisker-diagrams for carbonyls during summer 2010 (May, June, July, August). The markers indicate the 10-, 25-, 50-, 75- and 90-percentiles. Mean values are indicated by a cross.

3.2 Regional distribution of VOC

Figure 4–Figure 13 show maps with the stations' median concentrations of 10 light hydrocarbons for the winter months January, February, November and December in 2010 taken together. These medians are based on the average of the two 2-hourly values around noon at Rigi and on the day-time values at Hohenpeissenberg and Auchencorth Moss.

Although the number of sites obviously is too low to give a picture of the regional background distribution of hydrocarbons in Europe, some characteristics are indicated by these results. Similar figures for three carbonyls for the summer months May-August 2010 are given in Figure 14–Figure 16.

As noted in previous reports, the measurements indicate that hydrocarbons become fairly well mixed in Europe in winter. Components with a long chemical lifetime in winter, such as ethane and propane, show less geographical variations.

Many of the compounds showed highest seasonal mean concentrations at sites in Germany (Waldhof, Schmücke and Neuglobsow) in 2010.

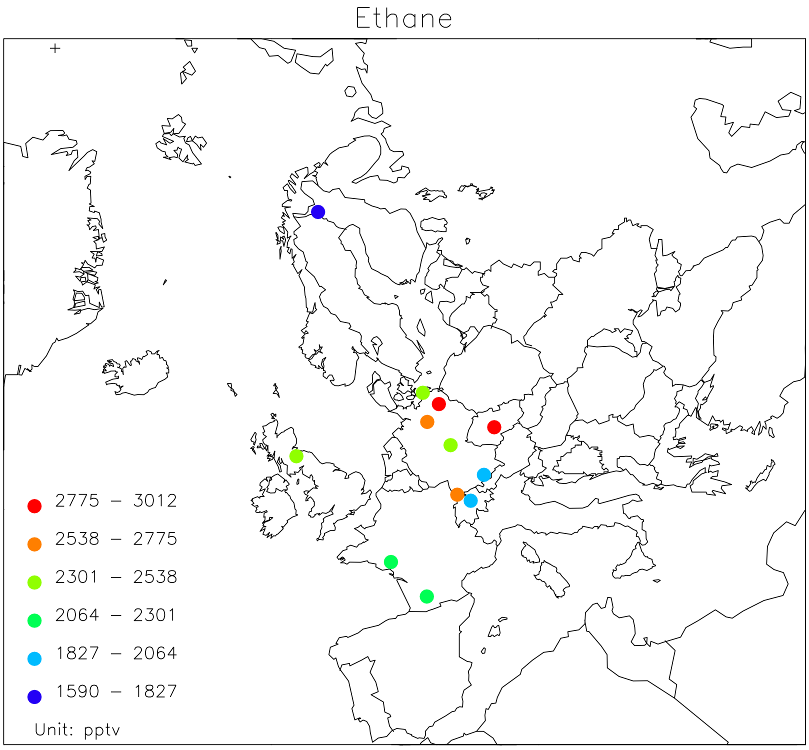

Figure 4: Median concentration of ethane at EMEP sites in the winter months November, December, January and February 2010 taken together.

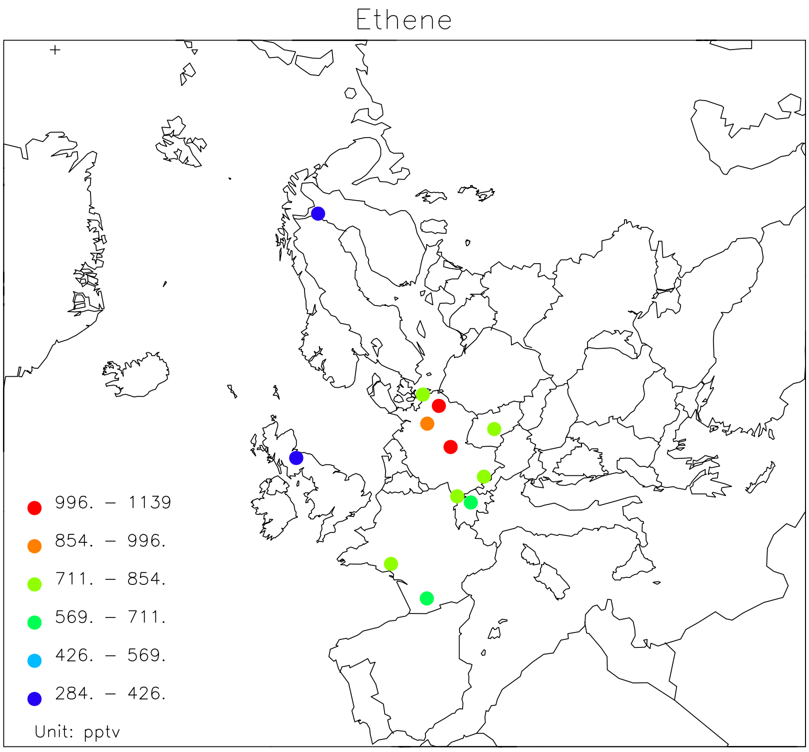

Figure 5: Median concentration of ethene at EMEP sites in the winter months November, December, January and February 2010 taken together.

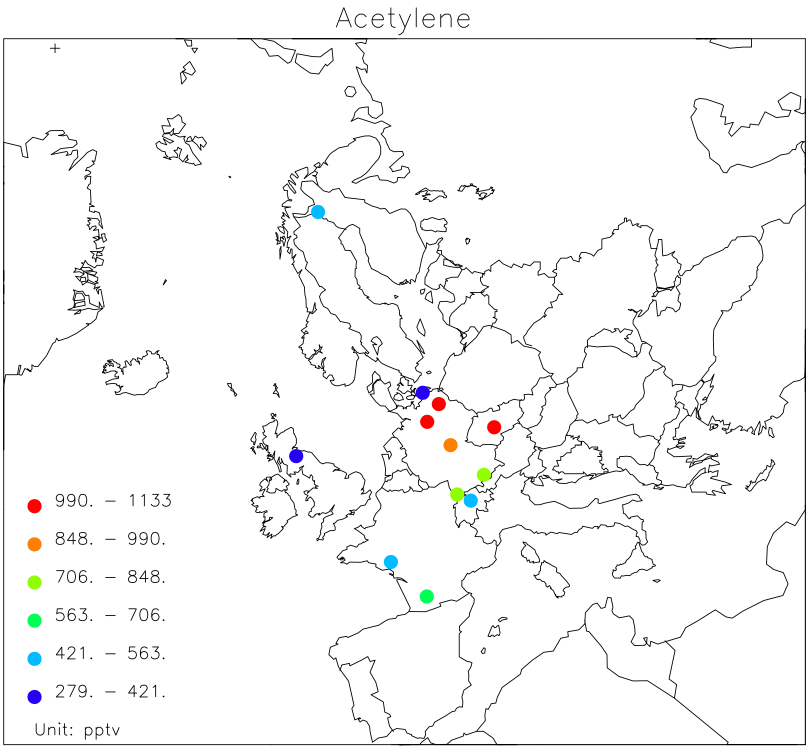

Figure 6: Median concentration of acetylene at EMEP sites in the winter months November, December, January and February 2010 taken together.

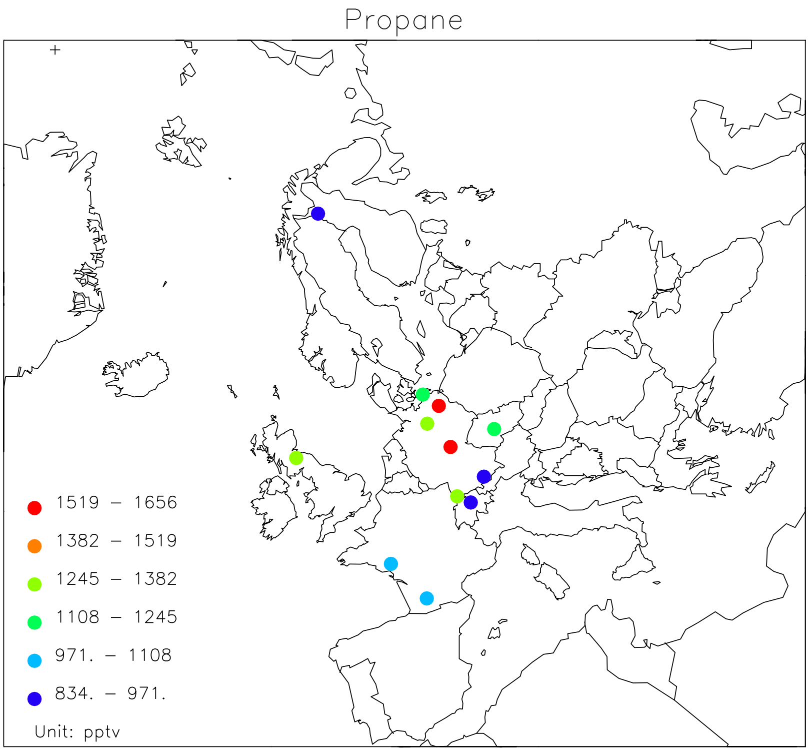

Figure 7: Median concentration of propane at EMEP sites in the winter months November, December, January and February 2010 taken together.

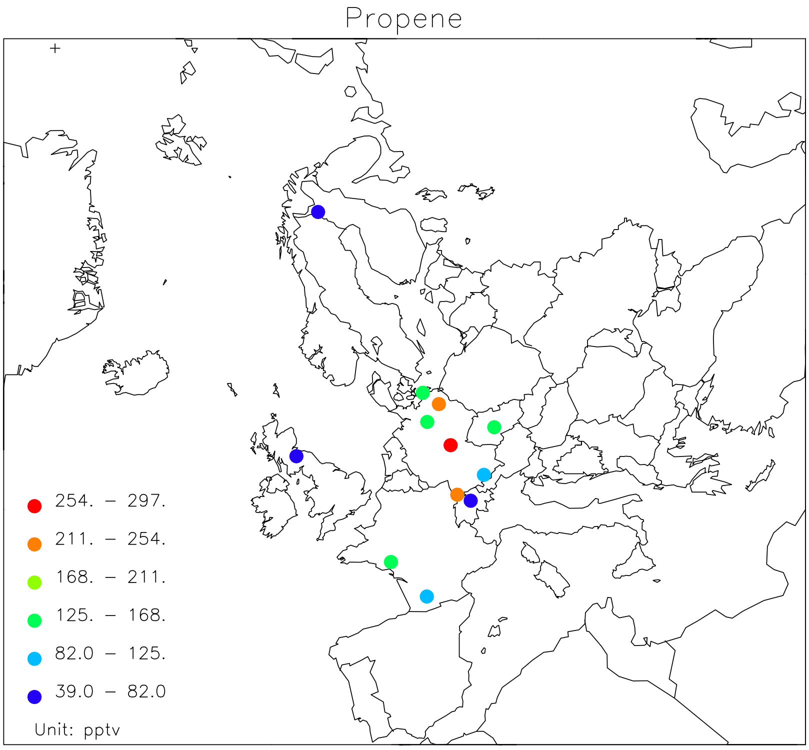

Figure 8: *Median concentration of propene at EMEP sites in the winter months November, December, January and February 2010 taken together.*

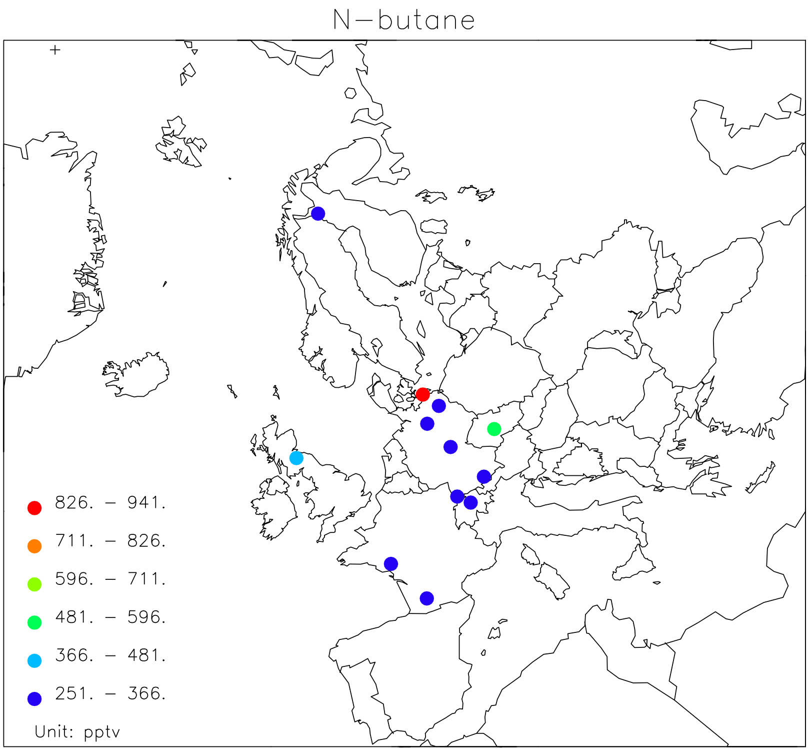

Figure 9: *Median concentration of n-butane at EMEP sites in the winter months November, December, January and February 2010 taken together.*

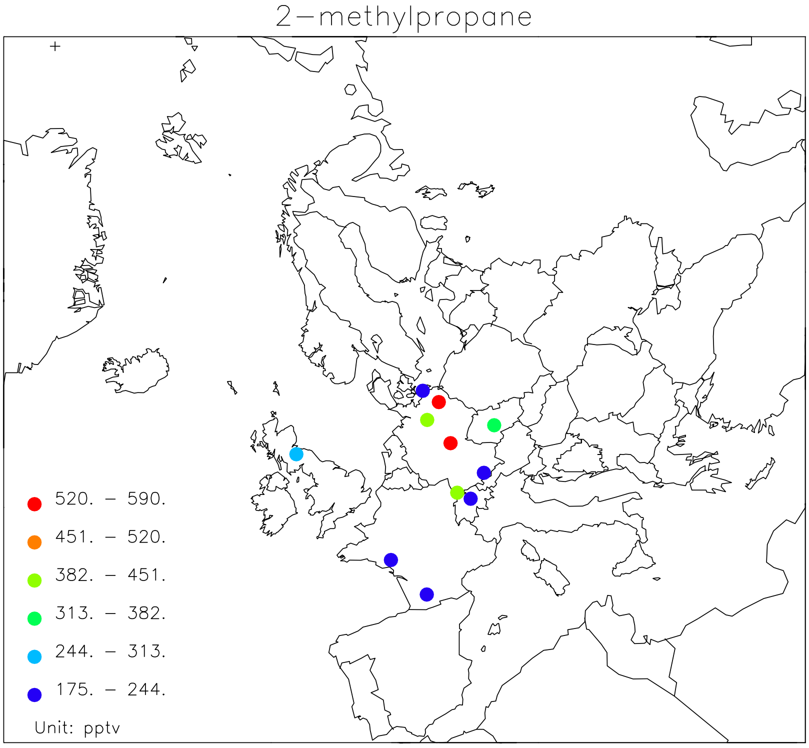

Figure 10: Median concentration of i-butane at EMEP sites in the winter months November, December, January and February 2010 taken together.

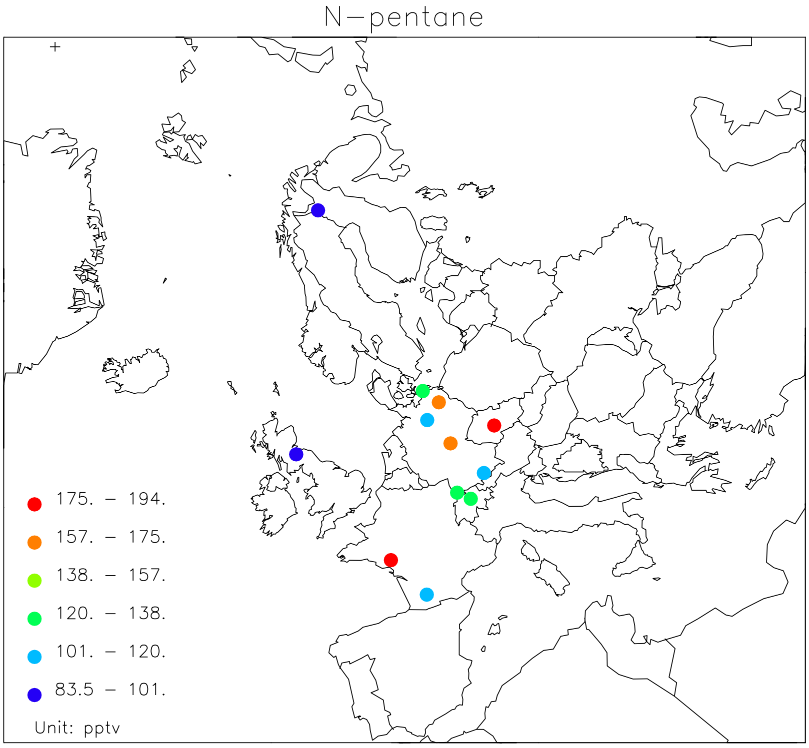

Figure 11: Median concentration of n-pentane at EMEP sites in the winter months November, December, January and February 2010 taken together.

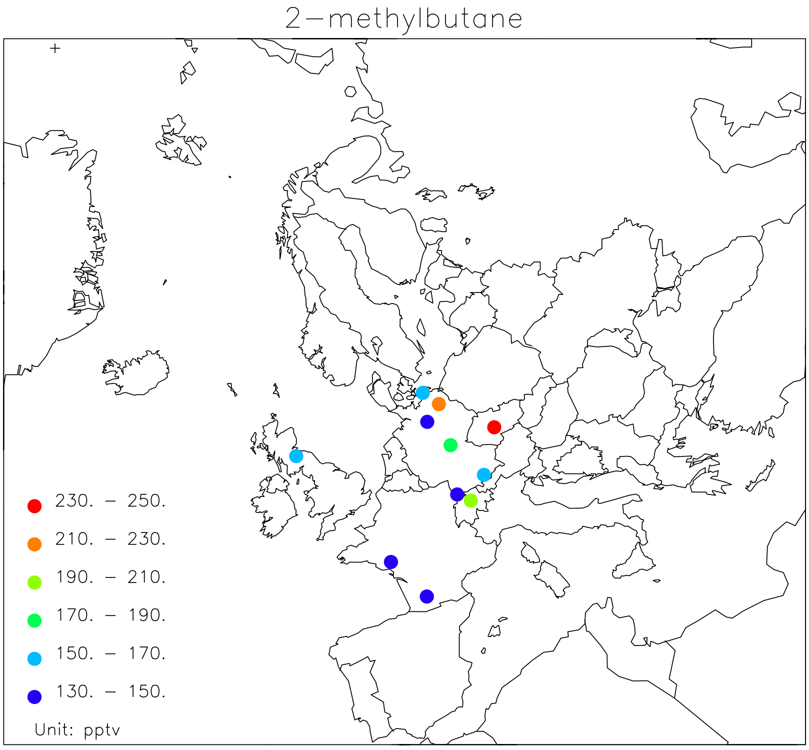

Figure 12: Median concentration of i-pentane at EMEP sites in the winter months November, December, January and February 2010 taken together.

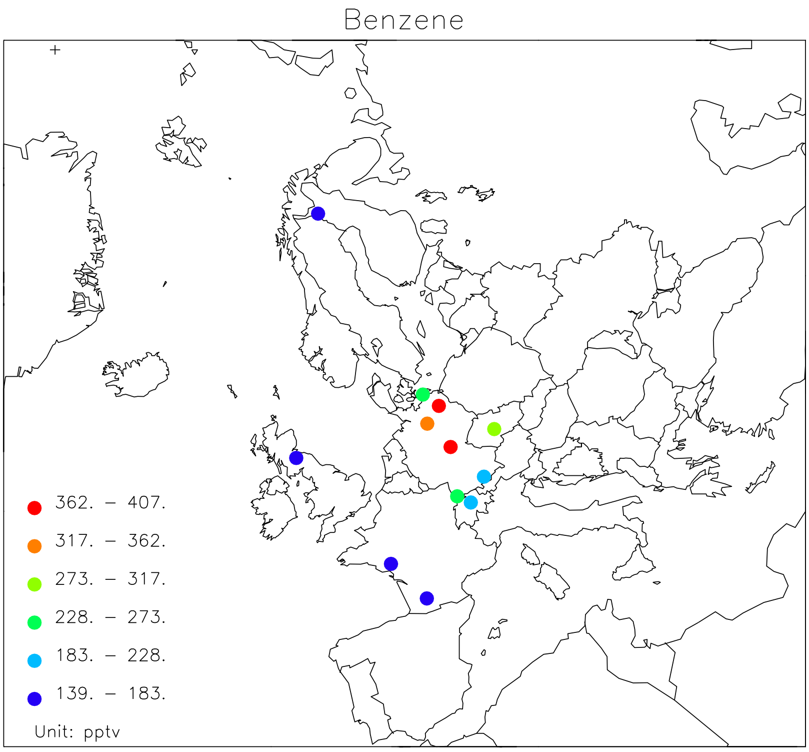

Figure 13: Median concentration of benzene at EMEP sites in the winter months November, December, January and February 2010 taken together.

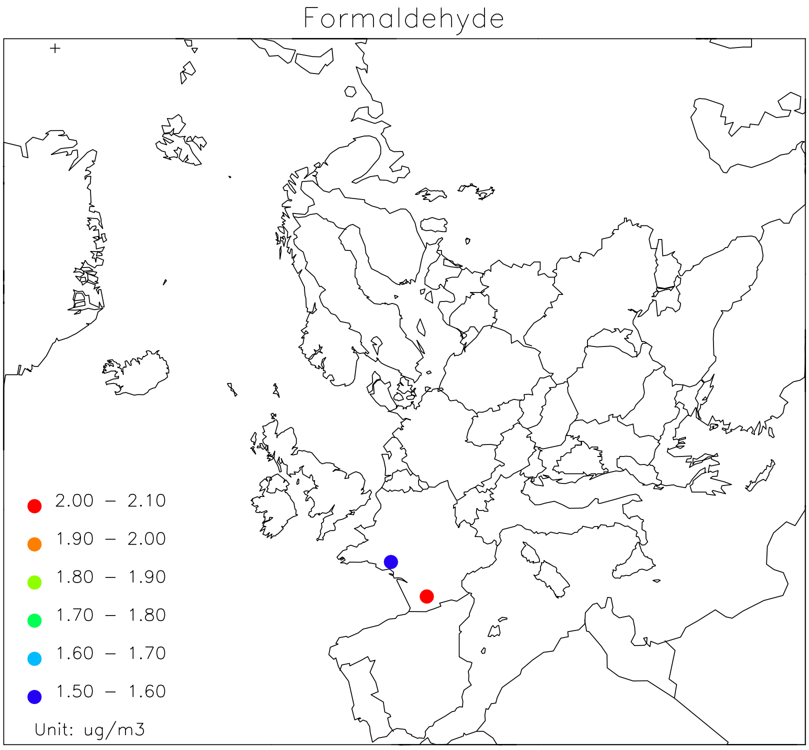

Figure 14: Median concentration of formaldehyde at EMEP sites in the summer months May, June, July and August 2010 taken together.

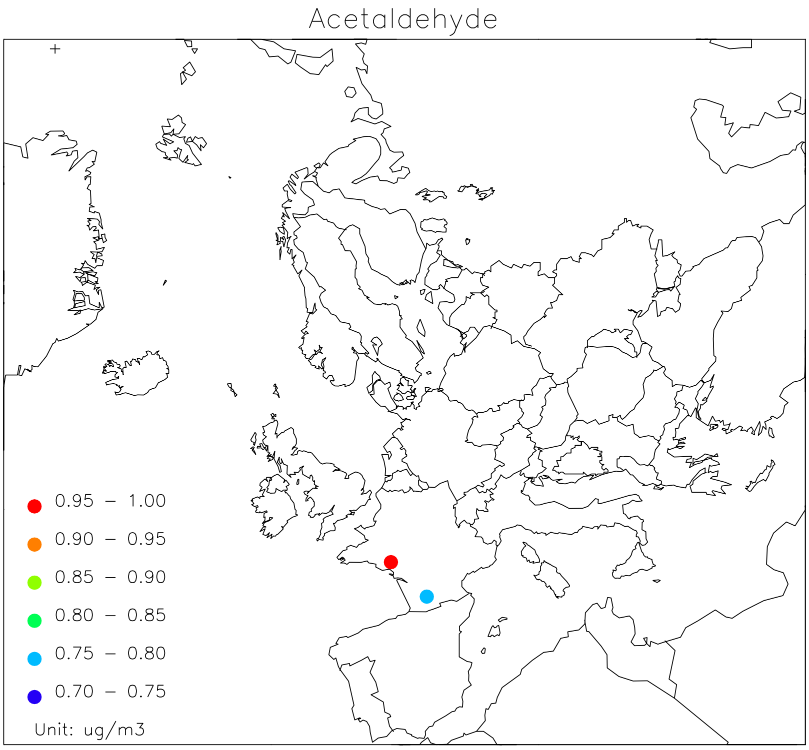

Figure 15: Median concentration of acetaldehyde at EMEP sites in the summer months May, June, July and August 2010 taken together.

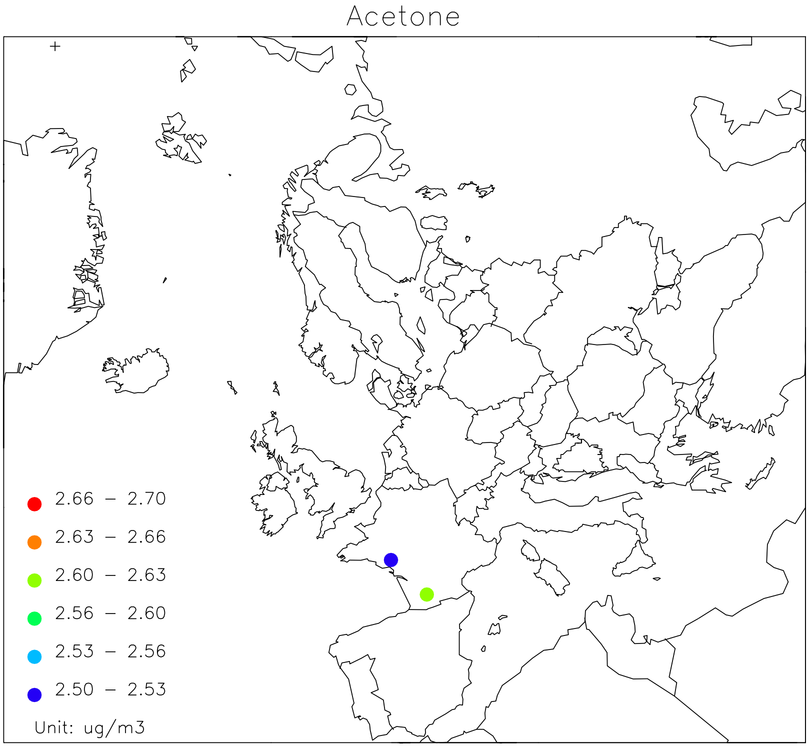

Figure 16: Median concentration of acetone at EMEP sites in the summer months May, June, July and August 2010 taken together.

4. Long-term trends in VOC

The 16 year's trend in the measured VOC from 1995 is indicated in Figure 17 showing the winter medians at Pallas (FI96), Waldhof (DE02), Schmücke (DE08), Košetice (CZ03) and Peyrusse Vieille (FR13) of selected hydrocarbons.

In addition to the emission source strength, these long-term trends or variations will be largely controlled by inter-annual changes in weather conditions and atmospheric stability.

The 16 year's trend, or variations, in the winter medians varies for the different hydrocarbons as indicated by Figure 17 and no overall picture is seen. For some compounds at some sites the results do indicate a long-term reduction in the winter median concentration level, whereas for other compounds, the year-to-year variations are too large to draw any further conclusions. The levels of benzene and toluene are apparently going down at many of the sites during this period, but there are several data gaps, making that an uncertain finding.

The results indicate an increase in the winter median concentrations for ethane and butane for the three-years period 2007-2010. Many of the components show high winter medians in 2010. This is particularly seen for ethane, propane, butane and iso-butane (2-methylpropane). The data also indicate an increase in benzene the last years. Whether this is due to the meteorological conditions (cold winters with stable stratification) or indicates increased emissions, is difficult to judge without detailed model calculations.

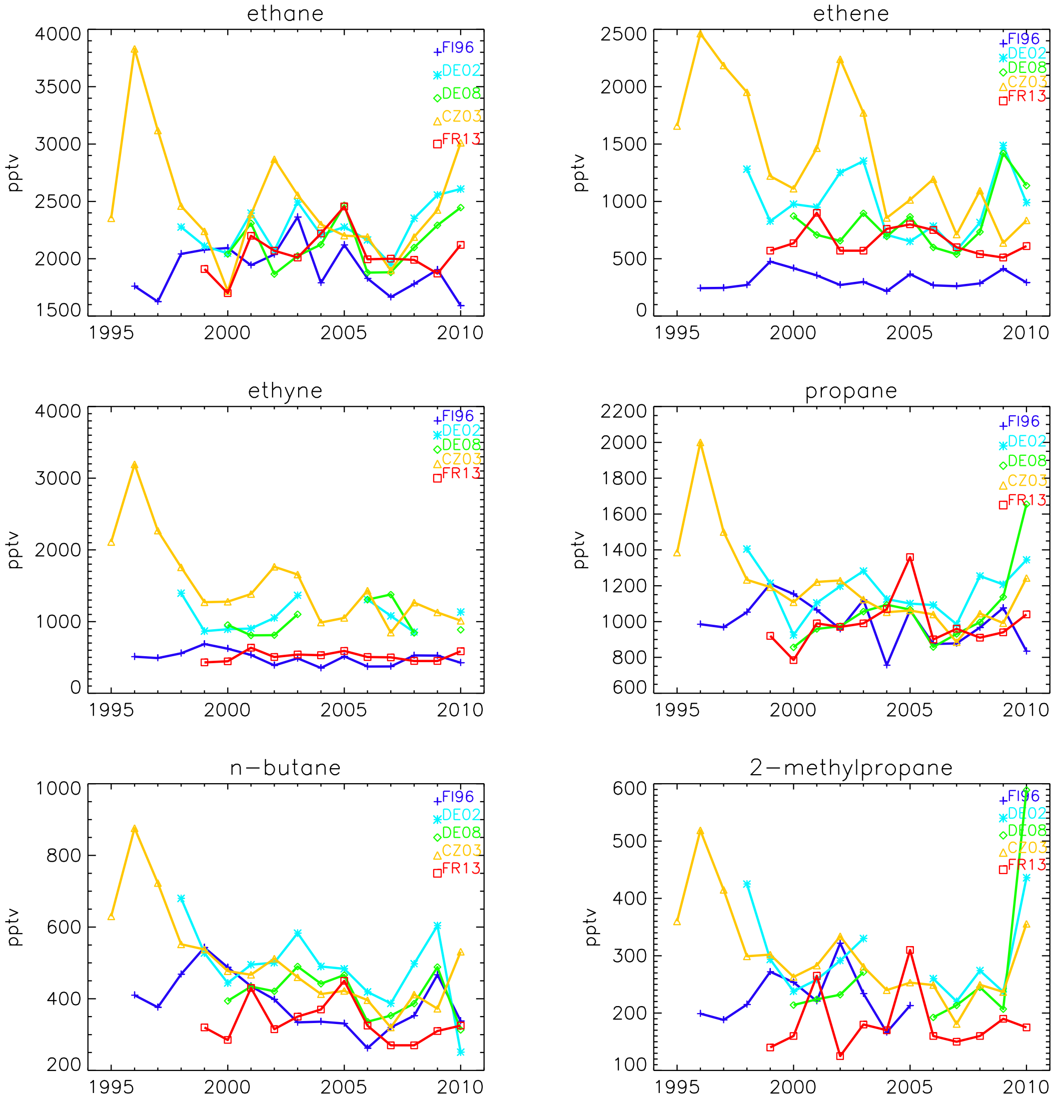

Figure 17: Annual winter (Jan., Feb., Nov., Dec.) median concentrations of hydrocarbons at Pallas (FI96), Waldhof (DE02), Schmücke (DE08), Košetice (CZ03) and Peyrusse Vieille (FR13) during the period 1995-2010.

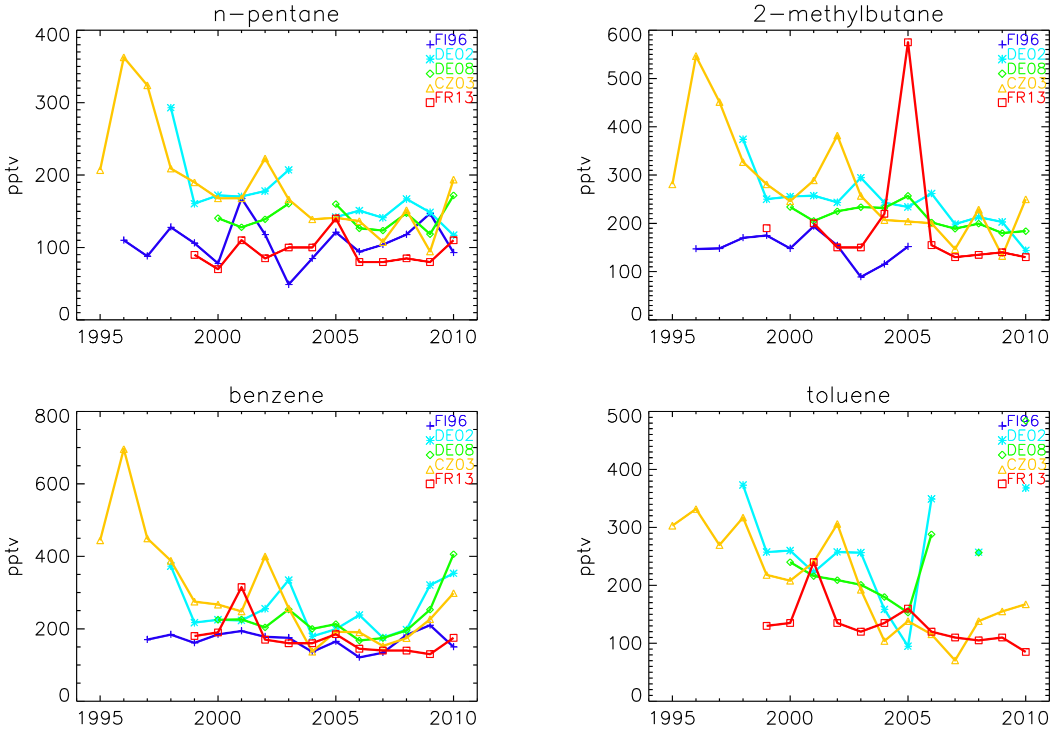

Figure 17, cont.

5. Acknowledgement

We would like to thank all people involved in the sampling and handling of hydrocarbon canisters and DNPH tubes. We are very grateful for the VOC measurement data provided by Neil Cape (CEH), Patrice Coddeville (EMD), Hannele Hakola (FMI), Radek Pokorny (CHMI), Alberto Moral Gonzalez (MMA), Karin Uhse (UBA), Christian Plass-Dülmer (DWD), Stefan Reimann (EMPA) and Hans Berkhout (RIVM).

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Appendix A

Monthly mean and median concentrations of hydrocarbons and carbonyls in 2010

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	1794	2324	2694	1792	1328	889	732	647	727	1084	1254	1526
	1781	2272	2659	1571	1331	873	712	619	713	1004	1252	1323
Auchencorth Moss	3095	2918	2336	2098	1493	935	810	792	996	1462	1849	2233
	2998	2798	2063	2083	1483	879	791	728	927	1263	1747	2087
Zingst	-	-	2812	2455	1860	1233	1005	1232	1695	2593	2303	3051
	-	-	2918	2430	1858	1302	1047	1190	1627	2044	2211	2821
Neuglobsow	-	-	3037	2580	1729	1362	1155	1355	1754	2731	2742	3491
	-	-	3027	2561	2002	1362	1082	1324	1678	2219	2213	3239
Waldhof	-	-	3024	2451	1892	1505	1290	1351	1835	2497	2424	3012
	-	-	2923	2556	1887	1425	1273	1347	1752	2339	2432	2683
Schmücke	-	-	2848	2845	1947	1348	1182	1112	1334	2809	2453	2614
	-	-	2988	2940	1953	1339	1149	1118	1415	2264	2353	2677
Schauinsland	-	-	2896	2407	1932	1257	1187	925	1760	2073	2220	-
	-	-	2871	2720	1996	1208	1097	855	1705	2066	2520	-
Hohenpeissenberg	3324	2546	2187	2027	1451	1042	762	736	945	1485	1617	2113
	3087	2308	1972	2021	1442	1024	779	739	895	1443	1686	1874
Košetice	3783	4153	2428	2261	1498	1161	943	958	1020	1847	2015	2759
	3534	3762	2196	2282	1517	1111	918	933	959	1812	1952	3126
Rigi	2602	2836	2354	2077	1476	1099	819	787	974	1400	1626	2063
	2213	2409	2135	2110	1455	1064	820	783	949	1281	1651	1844
La Tardière	2567	2315	2117	1911	1371	1082	657	681	796	1230	1586	2190
	2290	2210	1970	2070	1360	1090	730	680	835	1235	1430	2130
Peyrusse Vieille	2323	2455	2210	1760	1250	965	671	650	913	1193	1485	2188
	2270	2295	2030	1800	1340	1000	660	680	850	1185	1350	2115

ETHENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	457	592	162	87	75	61	225	92	89	179	185	251
	517	429	153	55	78	62	141	86	83	160	172	234
Auchencorth Moss	638	506	249	126	123	62	61	76	141	241	325	399
	566	403	111	94	69	51	51	51	77	120	214	300
Zingst	-	-	1451	551	255	268	326	352	427	720	753	1109
	-	-	1219	462	221	241	334	328	440	518	557	870
Neuglobsow	-	-	1418	705	368	322	308	491	512	706	1264	1118
	-	-	1433	412	366	360	316	433	427	767	947	1098
Waldhof	-	-	1547	631	386	266	309	508	433	760	981	1034
	-	-	1402	479	374	250	339	538	481	761	950	989
Schmücke	-	-	1379	801	418	296	333	368	367	823	1302	1244
	-	-	1214	690	342	267	282	341	371	709	764	1146
Schauinsland	-	-	1093	519	567	306	376	293	395	480	823	-
	-	-	1120	433	456	323	364	288	321	440	600	-
Hohenpeissenberg	2477	692	445	356	272	203	137	127	218	573	683	1049
	2767	467	225	296	196	182	129	106	187	504	593	557
Košetice	1129	847	269	287	159	197	109	119	138	614	723	1037
	1007	800	186	151	115	135	100	101	133	475	645	1131
Rigi	1334	865	516	336	279	212	158	178	232	505	663	836
	748	474	340	276	191	192	151	138	202	351	478	548
La Tardière	1194	671	529	366	287	262	257	239	260	555	699	1188
	1120	640	550	390	300	250	230	200	215	490	620	1070
Peyrusse Vieille	711	651	441	171	206	183	199	183	184	264	283	1370
	920	615	330	160	180	175	140	160	170	255	260	1410

PROPANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	944	1418	1514	635	329	92	137	110	163	411	589	853
	923	1318	1520	474	322	78	139	107	175	349	569	713
Auchencorth Moss	1659	1523	1086	722	387	202	162	256	459	625	871	1249
	1526	1417	818	660	322	147	109	169	311	445	790	1145
Zingst	-	-	1199	708	483	243	235	459	625	1234	1094	1674
	-	-	1102	641	416	221	239	442	671	962	1024	1450
Neuglobsow	-	-	1156	759	470	360	350	549	684	1160	1425	1911
	-	-	1118	769	455	322	304	423	558	1020	1337	2051
Waldhof	-	-	1175	783	518	321	432	665	686	1261	1173	1658
	-	-	1054	834	438	270	443	607	609	1195	1158	1382
Schmücke	-	-	1044	967	572	401	631	560	542	1369	1354	1785
	-	-	1179	988	521	333	493	586	563	1164	1334	1724
Schauinsland	-	-	845	787	575	446	364	229	589	768	1156	-
	-	-	793	753	556	479	344	180	538	792	1235	-
Hohenpeissenberg	1658	1144	816	634	366	273	229	206	288	599	739	1030
	1685	1084	659	611	331	253	235	189	277	550	774	848
Košetice	1784	1837	766	491	264	220	166	174	209	719	852	1188
	1656	1648	801	429	200	170	161	139	178	771	861	1322
Rigi	1305	1261	888	667	384	318	263	229	350	586	725	996
	1078	1070	734	655	331	309	245	213	326	516	724	822
La Tardière	1379	1081	888	681	348	288	248	216	240	510	744	1050
	1200	1040	690	770	320	260	210	210	230	525	610	1000
Peyrusse Vieille	1147	1160	891	1438	278	219	177	288	394	475	593	2370
	1050	1030	730	610	280	230	180	260	280	470	520	2605

PROPENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	61	57	33	32	48	31	49	39	41	28	42	30
	54	42	34	26	28	31	47	37	35	24	37	29
Auchencorth Moss	150	113	86	43	69	29	26	35	64	110	133	121
	103	80	51	29	23	23	23	23	40	40	51	69
Zingst	-	-	589	166	85	70	76	116	166	188	137	173
	-	-	416	76	57	48	56	77	109	90	124	164
Neuglobsow	-	-	496	224	64	163	103	93	100	152	248	248
	-	-	482	75	63	66	68	85	97	110	230	230
Waldhof	-	-	619	305	78	47	187	185	189	158	152	222
	-	-	609	201	61	48	45	88	105	117	156	200
Schmücke	-	-	566	309	99	94	73	105	295	218	221	392
	-	-	483	346	81	53	67	77	106	134	209	339
Schauinsland	-	-	378	116	79	125	112	81	102	98	324	-
	-	-	499	71	80	107	66	67	78	92	242	-
Hohenpeissenberg	265	67	44	31	29	23	16	19	27	62	91	127
	246	53	26	26	21	20	14	17	21	59	66	69
Košetice	182	133	35	58	30	43	21	22	34	95	206	243
	158	115	27	31	23	22	21	21	24	87	157	250
Rigi	153	86	62	54	51	45	41	49	50	81	97	105
	87	56	51	47	41	42	39	41	45	61	67	64
La Tardière	204	148	130	113	98	94	92	82	86	138	144	196
	210	135	130	120	100	110	80	80	75	130	110	210
Peyrusse Vieille	120	118	69	50	60	52	73	51	69	105	58	270
	110	120	60	50	60	50	60	50	50	55	50	280

ETHYNE (ACETYLENE)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	551	802	657	362	193	86	108	63	100	210	280	402
	610	662	616	296	202	61	62	60	90	166	257	382
Auchencorth Moss	400	450	291	227	134	69	58	79	113	135	197	283
	332	406	268	231	129	74	55	74	111	120	175	268
Zingst	-	-	821	316	125	75	77	172	201	432	441	564
	-	-	821	141	82	53	75	168	231	298	353	549
Neuglobsow	-	-	751	653	604	431	384	619	810	958	1142	1255
	-	-	676	711	545	481	443	624	758	864	984	1186
Waldhof	-	-	727	546	588	436	344	613	605	930	978	1076
	-	-	579	519	640	446	359	588	609	823	1056	1142
Schmücke	-	-	612	708	606	475	451	651	643	1070	828	1106
	-	-	707	698	542	510	500	692	701	1023	682	1005
Schauinsland	-	-	543	829	422	368	494	633	722	911	760	-
	-	-	515	880	399	237	491	604	779	857	794	-
Hohenpeissenberg	2049	848	630	538	324	216	160	145	218	626	598	947
	2244	639	436	485	280	201	144	136	197	483	558	615
Košetice	2343	2107	992	1030	579	457	274	346	520	1085	548	762
	2367	1629	900	986	570	381	285	346	466	1092	355	871
Rigi	1063	849	551	427	226	178	130	129	201	389	422	548
	693	574	383	385	192	169	119	108	191	254	308	377
La Tardière	806	695	558	478	210	138	120	112	119	303	333	728
	710	575	540	480	190	150	100	90	110	230	270	670
Peyrusse Vieille	680	761	574	334	184	146	100	89	118	253	251	720
	600	785	430	350	180	110	60	80	130	230	260	740

N-BUTANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	364	593	507	209	91	67	41	41	41	138	327	381
	368	551	476	130	66	14	40	32	37	109	204	271
Auchencorth Moss	596	561	353	211	112	85	80	113	184	237	336	462
	529	486	240	141	79	62	50	70	120	161	302	409
Zingst	-	-	745	660	465	386	520	621	733	981	847	1236
	-	-	687	606	464	398	445	667	742	788	848	1140
Neuglobsow	-	-	185	94	69	75	73	85	134	182	292	338
	-	-	171	82	71	68	57	79	94	154	285	339
Waldhof	-	-	181	144	89	48	239	148	135	341	225	366
	-	-	140	117	82	38	81	106	84	213	210	348
Schmücke	-	-	152	161	88	65	64	83	156	198	234	355
	-	-	170	105	81	59	52	75	87	145	199	360
Schauinsland	-	-	137	104	108	107	117	36	94	126	255	-
	-	-	125	92	74	106	72	26	64	125	288	-
Hohenpeissenberg	665	386	250	178	116	98	92	82	111	224	287	409
	704	373	179	165	103	87	88	77	103	222	292	314
Košetice	664	635	275	264	229	122	81	81	97	278	390	498
	612	592	269	175	89	75	73	64	80	248	406	522
Rigi	502	435	299	225	151	154	139	113	162	244	311	378
	408	356	256	204	123	151	124	102	146	193	282	302
La Tardière	477	361	321	240	133	188	183	161	121	198	302	420
	400	305	260	240	120	140	140	110	110	195	290	400
Peyrusse Vieille	366	369	249	259	90	73	70	82	82	145	163	983
	350	340	210	130	80	70	80	80	80	135	150	1105

2-METHYLPROPANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Auchencorth Moss	352	341	221	133	74	54	49	67	108	144	196	272
	310	302	161	99	62	41	29	50	79	99	170	240
Zingst	-	-	186	92	71	41	41	154	158	271	197	284
	-	-	181	79	48	31	44	85	142	158	165	257
Neuglobsow	-	-	799	414	121	126	124	232	257	369	496	642
	-	-	756	225	135	104	104	176	176	325	434	667
Waldhof	-	-	842	397	157	92	166	271	206	425	450	558
	-	-	853	204	93	64	158	213	224	421	415	527
Schmücke	-	-	801	420	151	119	157	205	276	341	512	664
	-	-	829	342	141	108	109	155	156	246	487	635
Schauinsland	-	-	722	272	166	190	160	74	189	227	381	-
	-	-	736	172	131	194	153	56	143	251	388	-
Hohenpeissenberg	404	229	156	117	73	67	62	51	74	169	170	239
	421	216	108	105	69	58	60	47	62	143	173	178
Košetice	427	413	172	146	83	103	63	72	61	199	317	342
	392	381	142	108	67	54	52	49	50	150	332	377
Rigi	289	256	180	131	81	81	70	57	86	151	176	216
	236	216	150	116	66	79	65	51	78	114	153	171
La Tardière	264	220	201	267	53	78	144	70	50	96	866	222
	230	160	210	140	40	70	130	40	45	95	160	240
Peyrusse Vieille	209	214	160	374	136	47	48	77	58	99	110	750
	180	165	160	190	50	35	50	50	50	90	100	840

BUTENES

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Auchencorth Moss	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Neuglobsow	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Schauinsland	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Hohenpeissenberg	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Rigi	92	71	63	64	60	72	79	72	79	94	86	70
	71	61	60	64	59	72	79	69	77	84	76	53
La Tardière	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Peyrusse Vieille	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-

1-BUTENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Auchencorth Moss	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Zingst	-	-	57	21	10	9	9	8	9	10	23	32
	-	-	50	14	12	10	8	8	8	8	25	29
Neuglobsow	-	-	68	26	6	10	10	12	12	22	42	42
	-	-	60	17	6	9	7	9	12	9	42	36
Waldhof	-	-	61	29	12	6	9	14	21	21	30	50
	-	-	58	26	11	5	9	14	13	21	31	37
Schmücke	-	-	53	31	12	10	10	9	13	26	37	60
	-	-	50	19	11	10	8	8	11	23	34	51
Schauinsland	-	-	43	19	11	15	13	10	9	13	31	-
	-	-	45	10	11	11	10	9	9	10	28	-
Hohenpeissenberg	41	13	9	9	7	6	6	6	7	13	17	24
	36	11	7	8	6	6	5	6	6	12	14	14
Košetice	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Rigi	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
La Tardière	39	38	46	52	43	36	30	31	31	43	30	41
	40	40	40	50	40	40	30	30	30	45	30	40
Peyrusse Vieille	21	24	13	15	13	16	17	10	11	8	17	55
	20	20	10	20	10	10	20	5	10	5	10	50

TRANS_2_BUTENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Auchencorth Moss	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Zingst	-	-	30	20	16	13	10	13	16	13	22	34
	-	-	29	23	12	12	10	13	13	14	22	36
Neuglobsow	-	-	35	19	12	12	13	17	13	15	33	38
	-	-	29	17	13	11	11	15	13	12	29	37
Waldhof	-	-	29	23	16	11	12	18	19	16	23	34
	-	-	29	23	15	12	10	15	12	15	25	35
Schmücke	-	-	28	23	14	15	11	14	16	16	31	65
	-	-	27	25	13	13	10	13	12	16	30	66
Schauinsland	-	-	24	18	17	16	12	12	11	10	29	-
	-	-	23	17	16	15	12	12	10	10	27	-
Hohenpeissenberg	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Košetice	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Rigi	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
La Tardière	9	7	8	9	5	6	5	6	5	5	6	6
	5	5	5	10	5	5	5	5	5	5	5	5
Peyrusse Vieille	6	5	5	5	5	5	7	5	5	5	5	5
	5	5	5	5	5	5	5	5	5	5	5	5

CIS_2_BUTENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Auchencorth Moss	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Zingst	-	-	20	15	11	-	5	6	6	7	11	15
	-	-	18	15	11	-	6	6	5	7	11	15
Neuglobsow	-	-	25	13	7	10	7	10	6	-	18	17
	-	-	22	12	7	9	7	7	5	-	17	17
Waldhof	-	-	21	15	10	-	11	9	8	9	14	18
	-	-	19	19	9	-	12	10	9	9	13	18
Schmücke	-	-	18	12	7	9	8	-	-	10	15	28
	-	-	18	11	10	9	9	-	-	10	17	22
Schauinsland	-	-	16	11	9	11	-	-	-	9	15	-
	-	-	16	10	9	10	-	-	-	8	14	-
Hohenpeissenberg	12	7	6	5	4	3	3	3	3	5	6	8
	12	7	6	5	4	3	3	3	3	5	5	6
Košetice	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Rigi	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
La Tardière	5	6	7	7	6	5	6	6	7	9	8	8
	5	5	5	5	5	5	5	5	5	10	5	5
Peyrusse Vieille	5	5	5	5	5	5	5	5	5	7	6	9
	5	5	5	5	5	5	5	5	5	5	5	5

N-PENTANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	113	187	127	37	22	18	18	12	12	40	100	92
	114	170	111	28	22	6	13	11	10	27	61	77
Auchencorth Moss	75	74	54	40	28	25	26	34	50	58	88	105
	60	50	30	20	20	20	20	20	30	40	80	100
Zingst	-	-	103	36	43	23	30	43	121	100	117	158
	-	-	97	27	32	17	26	39	111	70	114	165
Neuglobsow	-	-	135	59	32	43	49	57	116	109	164	163
	-	-	97	60	28	37	31	68	70	112	164	159
Waldhof	-	-	103	54	44	28	49	140	89	194	124	149
	-	-	100	49	31	26	43	119	61	174	108	118
Schmücke	-	-	86	63	51	50	33	85	93	174	141	179
	-	-	96	54	45	44	31	57	85	126	124	188
Schauinsland	-	-	106	55	69	82	47	32	86	102	124	-
	-	-	60	47	60	81	53	32	60	96	141	-
Hohenpeissenberg	234	114	79	78	72	72	54	46	73	141	119	137
	230	99	46	64	54	43	50	40	56	106	100	89
Košetice	217	192	85	83	62	64	44	54	58	153	235	197
	189	186	73	63	48	49	32	43	50	175	166	219
Rigi	194	160	122	135	105	138	115	77	155	200	177	149
	143	106	95	102	73	102	84	54	111	115	123	105
La Tardière	200	215	403	431	412	412	278	164	154	210	280	208
	180	245	330	400	390	410	270	190	145	195	170	210
Peyrusse Vieille	149	173	94	57	69	25	34	28	51	51	70	140
	130	105	70	40	30	25	30	20	40	40	65	140

2-METHYLBUTANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Auchencorth Moss	179	180	104	64	39	37	38	46	77	81	122	149
	160	150	60	40	30	20	20	30	50	60	100	140
Zingst	-	-	126	54	81	54	44	78	106	133	156	182
	-	-	117	37	40	36	36	78	102	83	167	171
Neuglobsow	-	-	122	81	60	93	104	96	126	116	205	206
	-	-	111	68	50	71	92	97	95	123	206	213
Waldhof	-	-	121	90	82	43	124	164	150	172	158	172
	-	-	89	75	80	38	77	119	134	176	139	157
Schmücke	-	-	97	104	79	91	49	111	168	168	163	212
	-	-	102	73	77	71	52	94	83	120	144	219
Schauinsland	-	-	98	78	92	126	71	56	109	98	143	-
	-	-	68	55	83	118	75	45	76	92	147	-
Hohenpeissenberg	325	156	107	114	94	93	92	86	107	170	163	192
	372	143	79	105	88	81	91	76	91	166	145	135
Košetice	300	233	101	99	83	108	70	73	70	158	244	239
	256	210	89	73	59	72	56	64	52	134	205	278
Rigi	290	224	169	187	147	187	194	150	222	252	238	219
	226	172	153	169	127	169	167	121	190	166	189	168
La Tardière	196	148	174	211	78	98	141	111	65	115	370	186
	170	135	140	140	70	90	120	80	55	100	120	190
Peyrusse Vieille	169	143	101	69	79	41	57	68	58	70	76	178
	150	125	100	50	70	45	50	40	50	50	70	175

N-HEXANE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	35	52	32	11	11	14	7	5	9	11	23	27
	38	51	35	7	8	5	5	5	5	8	16	21
Auchencorth Moss	40	37	26	18	16	15	15	17	19	25	27	29
	39	31	11	11	11	11	11	11	11	20	20	31
Zingst	-	-	59	26	66	25	26	28	55	66	36	52
	-	-	57	23	24	15	22	25	39	30	28	51
Neuglobsow	-	-	63	33	31	83	45	32	32	37	52	56
	-	-	49	32	27	27	32	29	25	33	53	61
Waldhof	-	-	42	32	48	18	89	151	108	55	36	45
	-	-	37	27	39	16	37	39	40	50	35	40
Schmücke	-	-	39	39	34	32	23	31	28	49	37	116
	-	-	36	33	33	22	24	29	27	30	40	68
Schauinsland	-	-	38	34	33	70	88	32	29	28	50	-
	-	-	39	31	33	42	27	19	24	27	34	-
Hohenpeissenberg	70	29	19	15	14	11	11	11	14	24	28	41
	66	26	12	13	11	9	10	9	13	22	26	28
Košetice	74	60	26	23	15	14	12	10	13	34	47	61
	64	54	27	14	10	10	11	9	11	28	45	71
Rigi	46	35	22	23	22	24	22	18	24	27	30	36
	32	25	17	19	16	23	22	17	22	21	25	25
La Tardière	59	44	48	82	27	40	56	24	29	48	76	47
	50	35	50	40	20	40	40	20	30	50	30	50
Peyrusse Vieille	44	36	19	16	19	21	39	12	19	18	24	70
	50	30	20	10	20	10	10	10	10	10	25	70

ISOPRENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	7	7	7	7	7	7	48	28	26	7	7	7
	7	7	7	7	7	7	7	37	7	7	7	7
Auchencorth Moss	-	-	-	-	-	29	23	42	27	18	-	-
	-	-	-	-	-	21	11	21	21	11	-	-
Zingst	-	-	13	11	14	61	353	277	44	34	6	6
	-	-	11	8	6	47	225	139	17	10	6	6
Neuglobsow	-	-	13	15	11	101	326	215	35	11	-	10
	-	-	12	14	10	70	184	110	31	11	-	9
Waldhof	-	-	13	15	15	29	69	48	22	13	8	7
	-	-	12	17	10	29	81	46	16	8	8	7
Schmücke	-	-	11	13	20	36	36	26	44	27	9	10
	-	-	12	12	15	29	35	25	14	8	9	12
Schauinsland	-	-	16	14	17	100	88	45	29	17	18	-
	-	-	14	13	16	84	84	29	15	15	8	-
Hohenpeissenberg	9	3	5	14	21	54	98	34	18	12	8	6
	7	2	3	8	12	19	25	20	9	7	5	4
Košetice	8	9	4	17	29	144	186	101	23	10	18	6
	4	4	4	10	19	77	90	85	19	10	9	4
Rigi	10	10	10	26	34	69	120	77	33	24	16	11
	9	7	7	13	18	29	60	40	19	17	12	9
La Tardière	6	6	7	28	84	180	402	334	106	51	12	7
	5	5	5	20	10	130	280	265	100	25	5	5
Peyrusse Vieille	5	6	5	80	354	693	1700	756	586	120	16	16
	5	5	5	50	190	425	1220	790	440	40	10	15

BENZENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	207	311	203	114	65	33	41	24	50	79	108	140
	215	298	199	96	64	25	32	23	40	63	97	136
Auchencorth Moss	204	220	129	67	45	31	24	33	58	62	95	135
	160	200	111	62	40	31	22	31	49	49	89	129
Zingst	-	-	379	235	135	90	80	95	152	223	279	382
	-	-	349	235	105	68	71	91	160	138	198	299
Neuglobsow	-	-	354	228	151	114	66	123	163	262	430	418
	-	-	286	237	170	126	53	111	102	247	401	378
Waldhof	-	-	332	281	137	73	95	132	169	295	334	332
	-	-	310	277	131	66	83	124	131	267	331	353
Schmücke	-	-	349	293	160	119	82	121	141	334	406	455
	-	-	318	288	128	116	82	110	153	307	263	428
Schauinsland	-	-	301	236	165	113	113	78	145	203	262	-
	-	-	266	234	182	113	114	73	110	170	226	-
Hohenpeissenberg	557	243	169	131	75	52	38	41	63	156	151	244
	609	190	114	123	64	48	39	39	60	132	142	164
Košetice	382	311	142	119	56	34	24	31	46	225	296	448
	365	256	117	97	53	28	24	30	37	201	241	461
Rigi	371	309	207	147	82	64	48	51	74	140	159	216
	250	212	139	131	68	60	44	45	70	103	127	156
La Tardière	239	201	162	128	74	76	54	44	59	114	117	227
	220	165	140	120	70	70	50	40	50	90	90	210
Peyrusse Vieille	194	210	164	90	48	36	33	30	49	89	76	220
	180	205	120	90	50	35	30	30	40	80	70	230

TOLUENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Auchencorth Moss	107	137	75	28	23	25	20	30	44	43	62	70
	81	110	39	10	21	21	10	21	29	29	50	60
Zingst	-	-	203	140	239	285	219	218	363	651	458	318
	-	-	135	134	191	247	253	217	318	710	444	330
Neuglobsow	-	-	188	219	216	456	271	370	266	1206	1091	621
	-	-	158	139	207	288	187	295	279	1312	960	623
Waldhof	-	-	174	222	269	215	313	346	319	1274	526	309
	-	-	145	182	224	224	282	296	292	1387	561	304
Schmücke	-	-	176	439	450	483	637	599	668	1081	634	405
	-	-	175	459	395	385	634	441	676	1076	652	354
Schauinsland	-	-	202	242	288	360	386	264	262	1062	908	-
	-	-	199	212	305	299	331	239	163	1251	833	-
Hohenpeissenberg	310	122	84	84	76	59	54	60	83	125	140	166
	343	97	66	70	61	46	52	52	70	119	108	107
Košetice	218	141	69	66	54	53	29	35	36	123	200	223
	185	138	57	54	39	34	24	28	30	94	167	242
Rigi	271	192	141	143	115	139	120	101	158	189	167	149
	177	128	111	119	91	126	101	79	118	121	124	97
La Tardière	163	160	173	339	92	160	617	94	64	120	194	192
	165	120	140	130	70	150	190	70	60	105	100	160
Peyrusse Vieille	107	113	91	60	68	70	642	57	74	56	49	215
	100	100	90	50	60	75	110	40	80	55	40	225

ETHYLBENZENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Auchencorth Moss	21	24	20	12	12	12	12	12	14	20	19	14
	9	20	9	9	9	9	9	9	9	20	9	9
Zingst	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Neuglobsow	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Waldhof	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Schmücke	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Schauinsland	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Hohenpeissenberg	50	19	15	16	14	12	10	11	15	22	24	29
	57	14	10	13	12	10	9	9	14	23	19	17
Košetice	32	22	7	8	6	7	4	3	4	15	23	24
	26	19	6	9	5	4	2	2	2	10	19	23
Rigi	42	31	22	25	21	30	22	21	31	36	28	29
	28	21	18	21	17	27	21	19	28	30	21	20
La Tardière	29	29	34	36	22	34	39	30	23	33	32	40
	30	20	30	30	20	40	40	20	20	30	30	30
Peyrusse Vieille	15	17	13	6	9	6	8	9	9	14	20	58
	10	15	10	5	5	5	5	10	10	13	8	60

m+p-XYLENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Auchencorth Moss	38	53	40	24	17	17	17	19	22	39	32	23
	9	29	20	9	9	9	9	20	20	20	20	9
Zingst	-	-	65	28	65	23	17	35	35	112	98	83
	-	-	67	16	7	8	9	17	34	80	93	88
Neuglobsow	-	-	86	57	17	66	61	61	47	143	191	127
	-	-	62	22	12	19	14	33	29	144	158	110
Waldhof	-	-	64	61	24	7	123	63	57	151	123	97
	-	-	62	66	12	4	131	40	39	136	104	91
Schmücke	-	-	71	240	137	119	68	90	72	153	142	133
	-	-	67	205	147	122	65	93	74	145	145	132
Schauinsland	-	-	96	56	43	44	39	20	24	102	151	-
	-	-	115	23	38	26	15	8	25	121	127	-
Hohenpeissenberg	112	41	30	31	29	23	19	20	33	51	62	71
	125	33	22	25	21	16	17	16	27	46	46	41
Kosetice	83	44	15	23	16	19	8	8	10	37	67	63
	59	32	13	19	14	9	9	9	10	32	62	58
Rigi	106	68	50	57	46	61	43	39	58	90	72	79
	69	47	38	43	35	50	38	35	47	66	49	54
La Tardière	70	80	92	82	69	108	112	93	69	93	90	99
	70	60	80	60	60	90	110	70	70	90	80	80
Peyrusse Vieille	23	31	27	10	24	14	21	13	21	25	57	170
	20	25	20	10	20	15	20	10	20	20	25	185

o-XYLENE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pallas	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Auchencorth Moss	22	24	19	15	12	11	14	11	13	20	15	13
	9	20	9	9	9	9	9	9	9	20	9	9
Zingst	-	-	25	11	40	18	12	15	25	51	42	39
	-	-	24	8	5	13	11	7	19	28	39	41
Neuglobsow	-	-	33	27	8	35	35	31	23	46	122	62
	-	-	20	12	9	17	21	8	13	45	79	55
Waldhof	-	-	23	25	16	-	59	30	37	58	77	54
	-	-	23	11	11	-	78	18	33	56	60	48
Schmücke	-	-	24	81	41	45	26	29	24	52	61	74
	-	-	21	59	46	38	25	27	24	46	62	75
Schauinsland	-	-	36	23	32	26	30	9	12	33	74	-
	-	-	48	15	29	16	18	10	8	38	81	-
Hohenpeissenberg	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Kosetice	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Rigi	39	25	18	21	19	27	21	18	25	30	26	33
	29	18	13	17	17	23	20	16	21	23	17	24
La Tardière	27	24	29	23	16	24	39	23	14	21	24	30
	30	20	20	20	20	20	30	10	10	20	20	20
Peyrusse Vieille	9	11	8	6	9	6	8	7	10	8	15	50
	10	5	5	5	5	5	5	5	5	5	8	55

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

METHANAL (FORMALDEHYDE)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	1.451	1.227	1.151	1.831	1.223	2.732	2.796	1.599	2.243	1.480	1.344	0.896
	1.329	0.970	1.198	1.868	1.143	1.347	2.154	1.630	2.000	1.425	1.337	0.978
Peyrusse Vieille	0.841	0.810	1.210	1.289	2.052	2.410	2.691	2.076	-	1.750	0.570	1.335
	0.692	0.714	1.253	1.125	1.558	2.201	2.684	1.740	-	1.650	0.599	1.224

ETHANAL (ACETALDEHYDE)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	1.309	1.018	0.695	1.055	1.085	1.087	1.234	0.789	0.991	0.944	1.075	0.914
	1.361	0.862	0.736	0.997	1.064	1.137	1.007	0.770	0.989	0.772	1.118	0.966
Peyrusse Vieille	0.652	0.553	0.623	0.838	0.838	0.839	1.080	0.668	-	0.789	0.418	0.966
	0.580	0.444	0.608	0.758	0.647	0.818	0.990	0.586	-	0.768	0.323	0.887

PROPANONE (ACETONE)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	1.756	1.939	1.580	3.130	2.942	2.503	2.709	2.366	3.006	2.186	1.990	1.554
	1.718	1.535	1.829	2.753	3.051	2.501	2.168	2.380	2.652	1.938	1.816	1.567
Peyrusse Vieille	1.159	1.317	1.727	2.629	2.613	2.310	2.587	2.653	-	2.108	1.109	1.505
	1.147	1.084	1.512	2.895	2.151	2.606	2.719	2.237	-	2.132	1.057	1.477

PROPANAL

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	0.198	0.155	0.157	0.224	0.227	0.107	0.162	0.060	0.042	0.120	0.217	0.351
	0.184	0.140	0.167	0.209	0.226	0.081	0.092	0.015	0.041	0.119	0.192	0.373
Peyrusse Vieille	0.067	0.058	0.122	0.148	0.101	0.053	0.015	0.031	-	0.106	0.094	0.313
	0.055	0.050	0.112	0.125	0.098	0.016	0.015	0.016	-	0.112	0.064	0.323

2-PROPENAL (ACROLEIN)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	0.015	0.026	0.015	0.027	-	-	-	-	-	-	-	-
	0.015	0.015	0.015	0.016	-	-	-	-	-	-	-	-
Peyrusse Vieille	0.015	0.015	0.015	-	0.015	-	-	-	-	-	-	-
	0.015	0.015	0.016	-	0.016	-	-	-	-	-	-	-

2-BUTANONE (METHYLETHYLKETONE)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	0.493	0.581	0.355	0.524	0.768	0.449	0.337	0.218	0.378	0.527	0.992	0.394
	0.510	0.558	0.343	0.466	0.644	0.473	0.244	0.242	0.427	0.486	1.053	0.376
Peyrusse Vieille	0.282	0.316	0.340	0.488	0.261	0.236	0.189	0.130	-	0.281	0.184	0.353
	0.275	0.242	0.333	0.486	0.251	0.299	0.138	0.106	-	0.293	0.175	0.376

3-BUTEN-2-ONE (METHYLVINYLKETONE)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Peyrusse Vieille	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-

2-METHYL PROPENAL (METHACROLEIN)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	0.022	0.011	0.011	0.012	0.035	0.071	0.164	0.079	0.147	0.045	0.022	0.015
	0.019	0.011	0.011	0.012	0.019	0.049	0.085	0.076	0.114	0.031	0.013	0.012
Peyrusse Vieille	0.011	0.011	0.011	0.018	0.236	0.193	0.385	0.295	-	0.080	0.015	0.016
	0.011	0.011	0.012	0.011	0.037	0.175	0.440	0.324	-	0.057	0.012	0.012

BENZENECARBALDEHYDE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	0.087	0.118	0.056	0.081	0.170	0.176	0.176	0.107	0.088	0.198	0.168	0.063
	0.090	0.095	0.056	0.067	0.100	0.172	0.148	0.106	0.071	0.213	0.080	0.051
Peyrusse Vieille	0.046	0.040	0.076	-	0.108	0.171	0.225	0.207	-	0.062	0.029	0.053
	0.044	0.042	0.040	-	0.043	0.206	0.237	0.243	-	0.036	0.017	0.051

PENTANAL

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
Peyrusse Vieille	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-

ETHANEDIAL (GLYOXAL)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	0.024	0.038	0.017	0.029	0.019	0.011	0.053	0.019	0.054	0.012	0.016	0.020
	0.011	0.011	0.011	0.024	0.017	0.011	0.039	0.011	0.044	0.012	0.012	0.012
Peyrusse Vieille	0.011	0.018	0.020	0.054	0.070	0.027	0.044	0.041	-	0.021	0.012	0.034
	0.011	0.011	0.012	0.021	0.040	0.012	0.045	0.036	-	0.012	0.012	0.031

HEXANAL

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	0.081	0.081	0.095	0.097	0.147	0.186	0.185	0.103	0.097	0.133	0.093	0.047
	0.071	0.089	0.104	0.102	0.139	0.120	0.151	0.096	0.097	0.142	0.085	0.051
Peyrusse Vieille	0.015	0.023	0.034	0.088	0.125	0.152	0.105	0.076	-	0.074	0.049	0.065
	0.015	0.015	0.016	0.079	0.095	0.129	0.099	0.074	-	0.076	0.044	0.065

2-OXOPROPANAL (METHYLGLYOXAL)

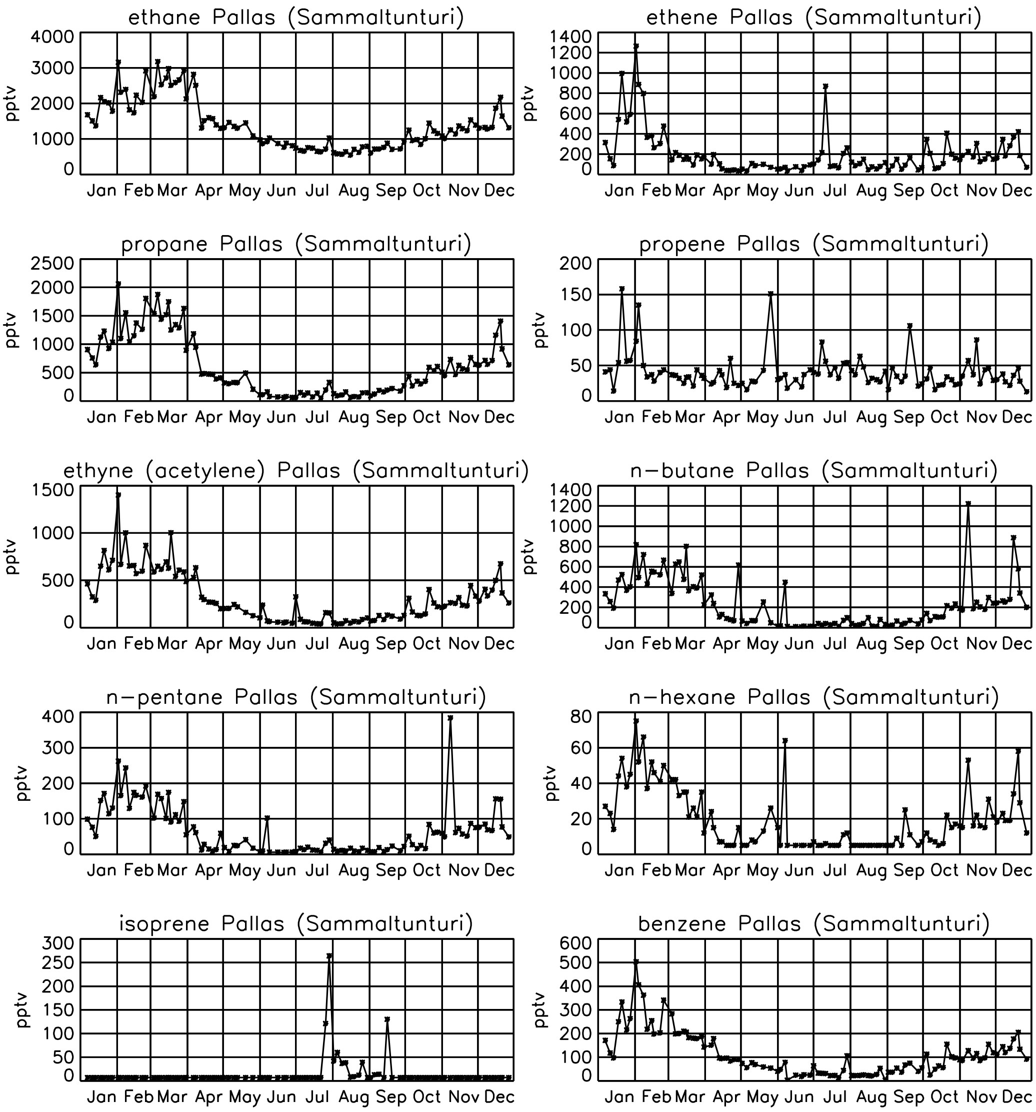
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
La Tardière	0.028	0.045	0.026	0.048	0.029	0.093	0.146	0.038	0.089	0.041	0.020	0.029
	0.027	0.043	0.015	0.054	0.023	0.044	0.095	0.032	0.070	0.017	0.017	0.016
Peyrusse Vieille	0.015	0.021	0.034	0.059	0.110	0.200	0.368	0.142	-	0.049	0.028	0.066
	0.015	0.015	0.016	0.063	0.068	0.095	0.267	0.156	-	0.048	0.017	0.066

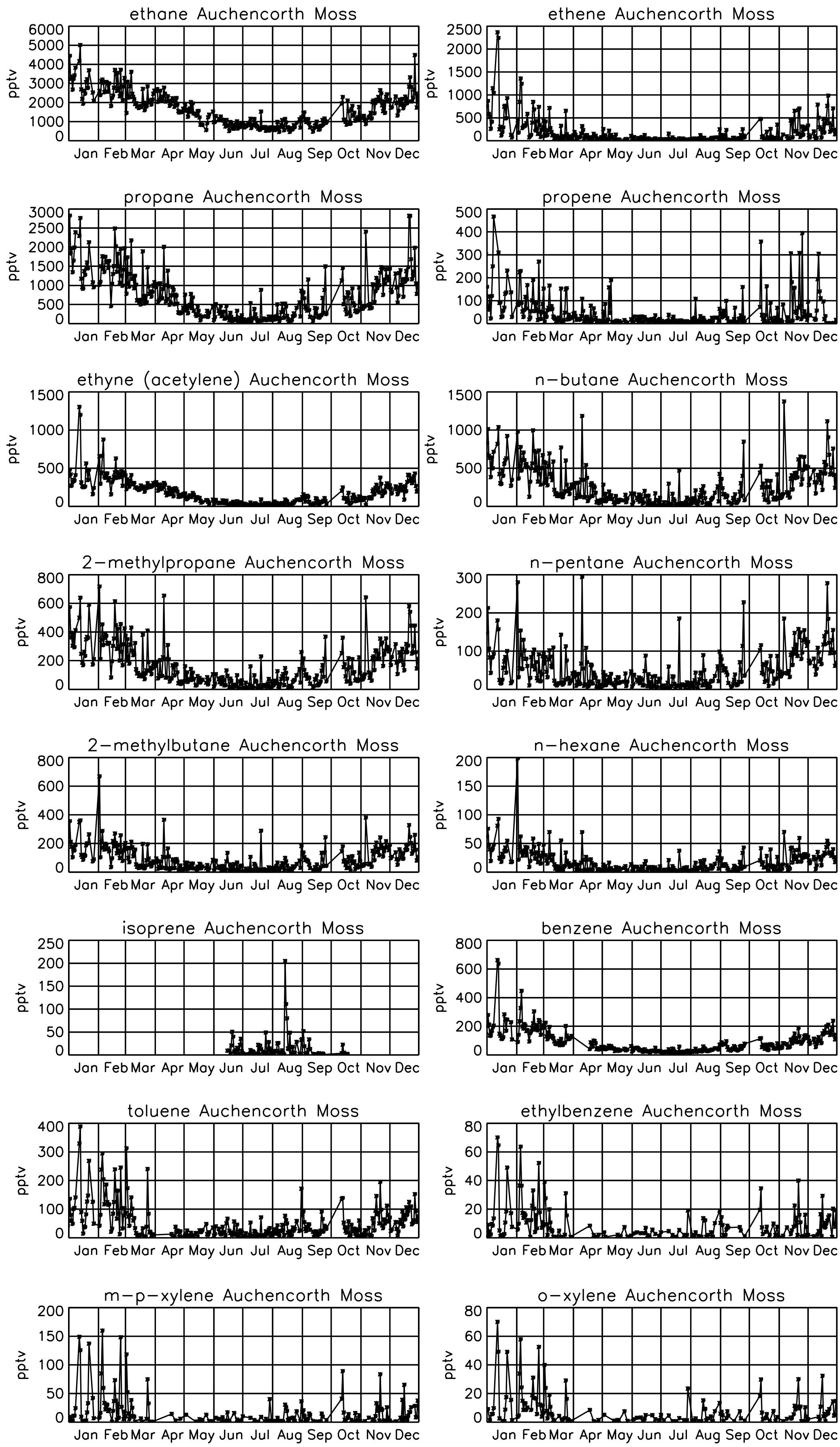
Appendix B

Time series of VOC measured in 2010

Explanations and synonyms to component names

ethyne:	acetylene
butane:	n-butane
isobutane:	i-butane
pentane:	n-pentane
isopentane:	i-pentane
hexane:	n-hexane
methanal:	formaldehyde
ethanal:	acetaldehyde
propanone:	acetone
N2propenal:	2-propenal (acrolein)
N2butanone:	2-butanone (methyl ethyl ketone)
N3buten2one:	3-buten-2-one (methyl vinyl ketone)
N2methylpropenal:	2-methyl propenal (methacrolein)
benzenecarbaldehyde:	benzaldehyde
ethanedial:	glyoxal
N2oxoproanal:	2-oxopropanal (methyl glyoxal)


ethane Pallas (Sammaltunturi)
ethene Pallas (Sammaltunturi)
propane Pallas (Sammaltunturi)
propene Pallas (Sammaltunturi)
ethyne (acetylene) Pallas (Sammaltunturi)
n−butane Pallas (Sammaltunturi)
n−pentane Pallas (Sammaltunturi)
n−hexane Pallas (Sammaltunturi)
isoprene Pallas (Sammaltunturi)
benzene Pallas (Sammaltunturi)
pptv
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec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ethene Auchencorth Moss
propane Auchencorth Moss
propene Auchencorth Moss
ethyne (acetylene) Auchencorth Moss
n−butane Auchencorth Moss
2−methylpropane Auchencorth Moss
n−pentane Auchencorth Moss
2−methylbutane Auchencorth Moss
n−hexane Auchencorth Moss
isoprene Auchencorth Moss
benzene Auchencorth Moss
toluene Auchencorth Moss
ethylbenzene Auchencorth Moss
m−p−xylene Auchencorth Moss
o−xylene Auchencorth Moss
pptv
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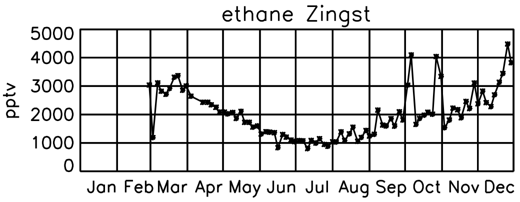
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pptv
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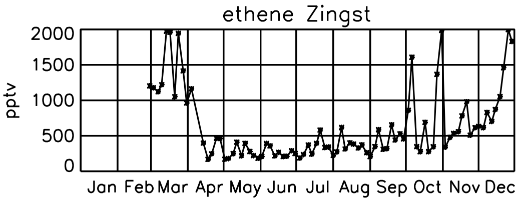
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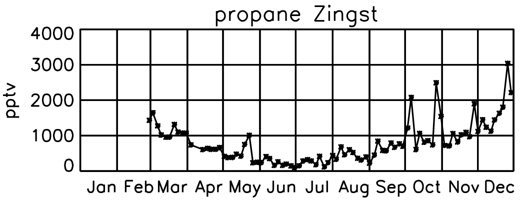
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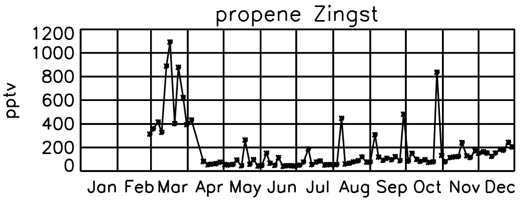
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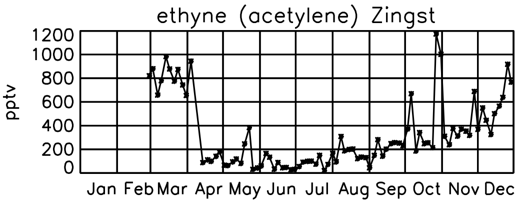
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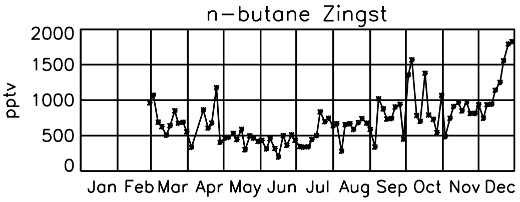
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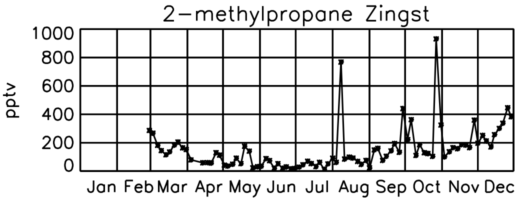
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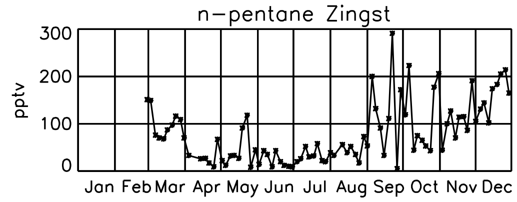
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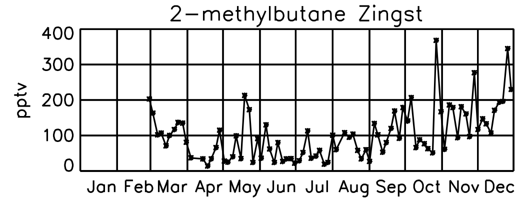
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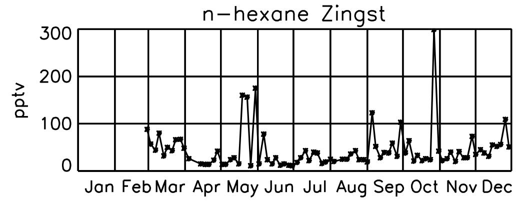
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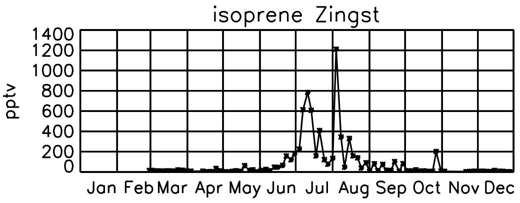
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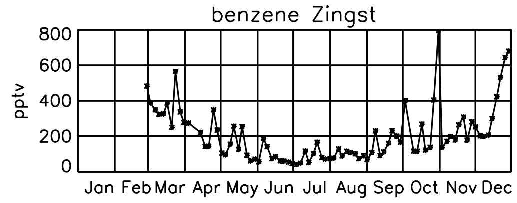
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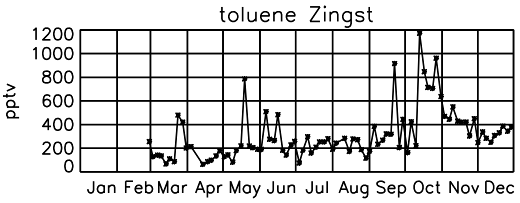
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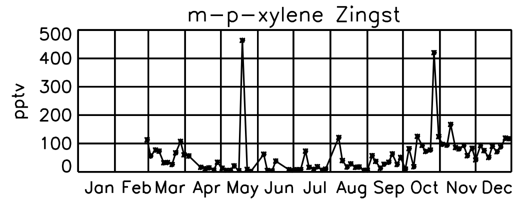
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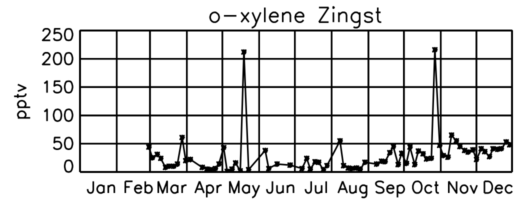
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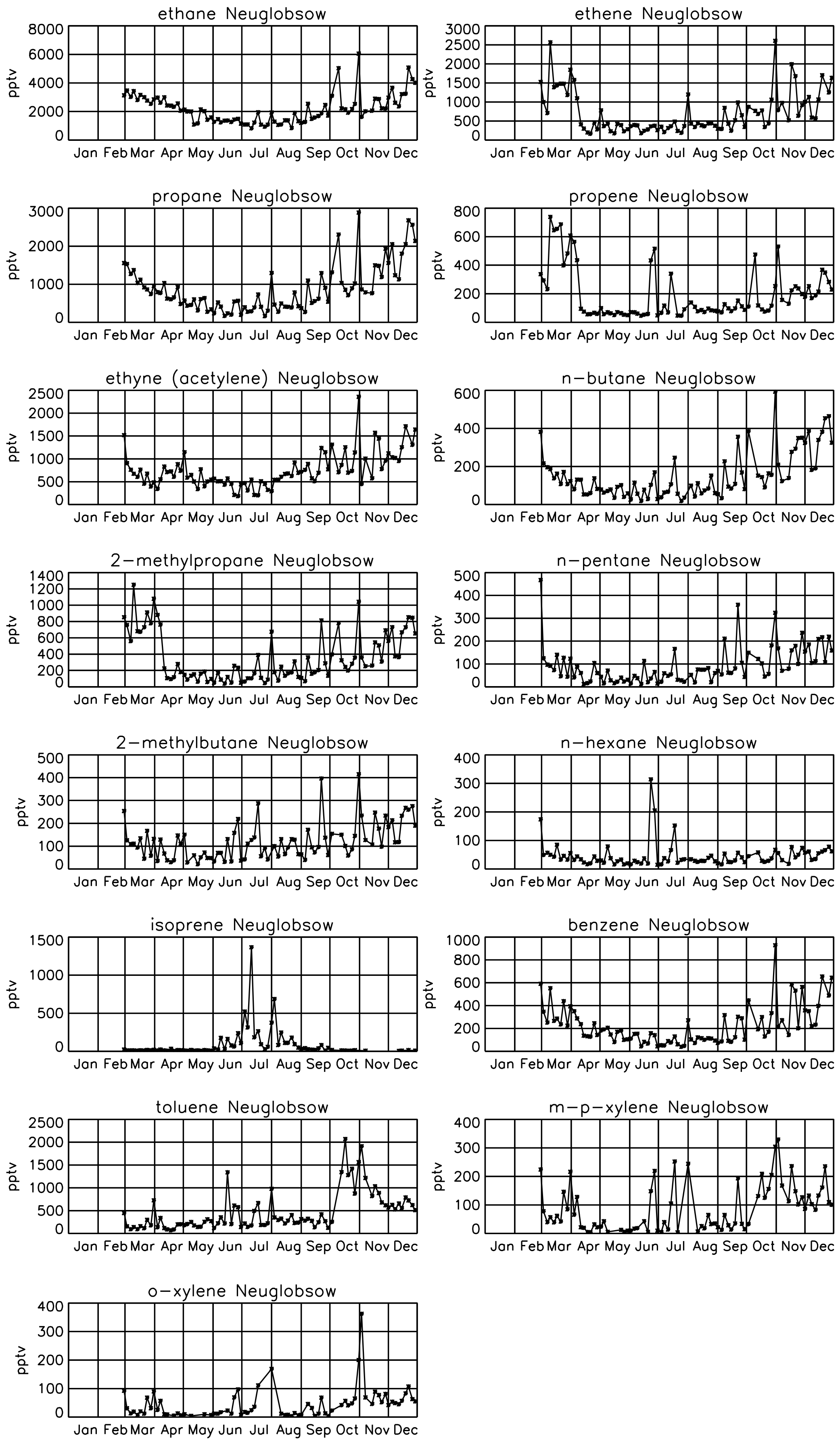
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ethene Neuglobsow
propane Neuglobsow
propene Neuglobsow
ethyne (acetylene) Neuglobsow
n−butane Neuglobsow
2−methylpropane Neuglobsow
n−pentane Neuglobsow
2−methylbutane Neuglobsow
n−hexane Neuglobsow
isoprene Neuglobsow
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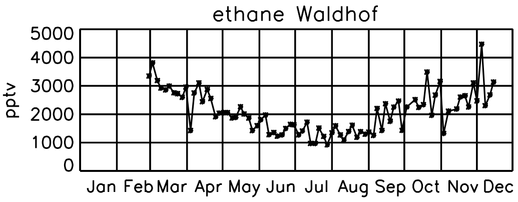
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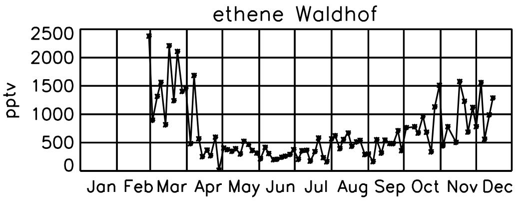
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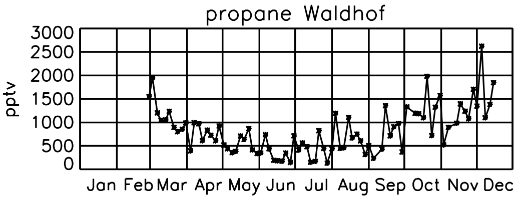
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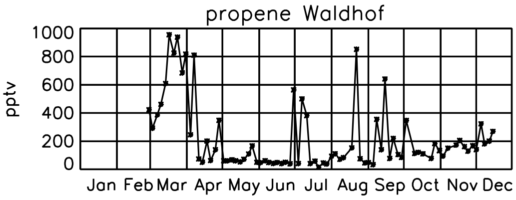
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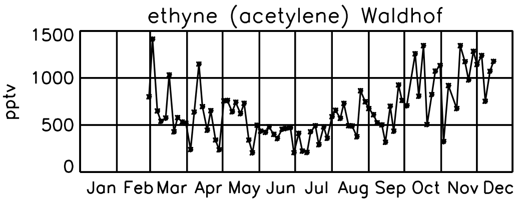
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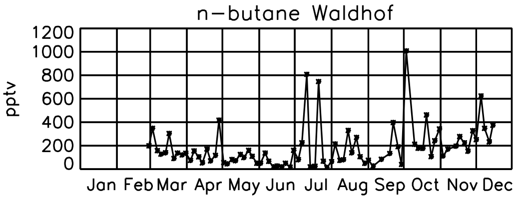
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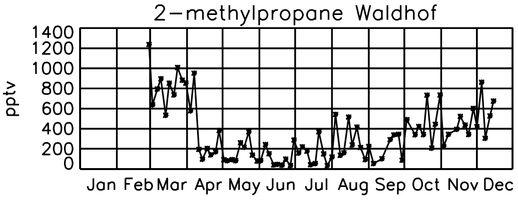
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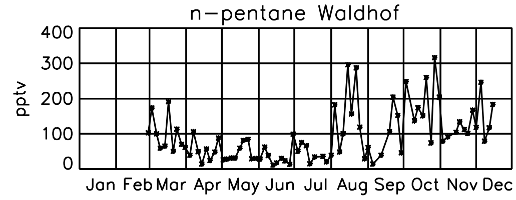
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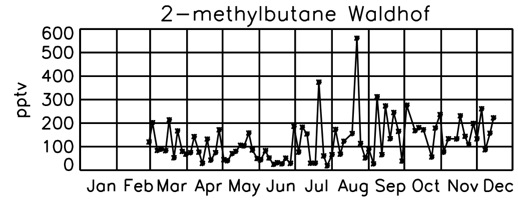
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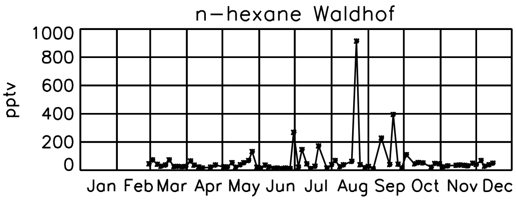
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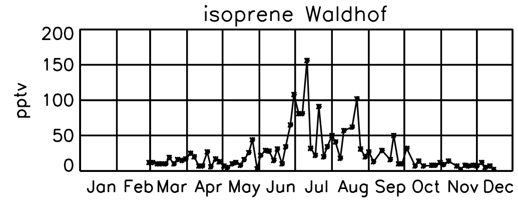
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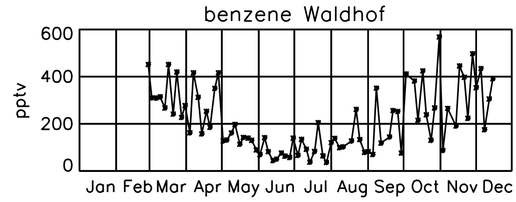
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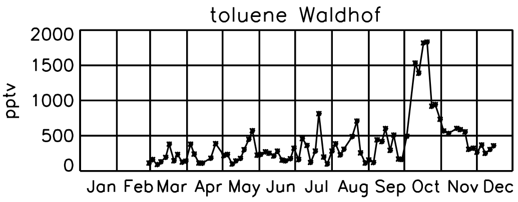
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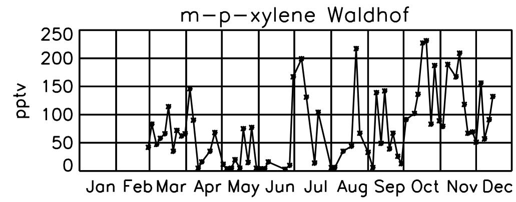
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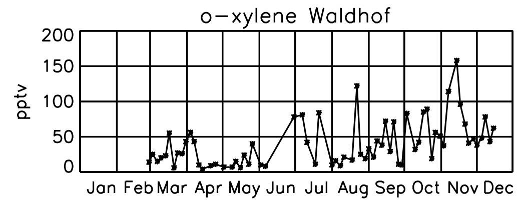
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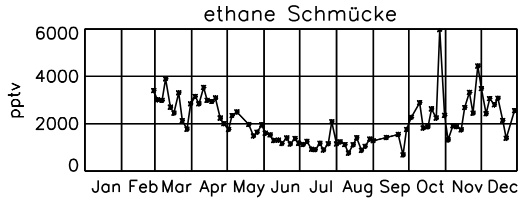
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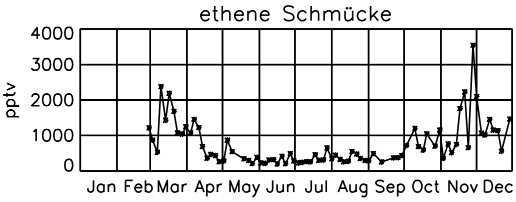
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1000
0
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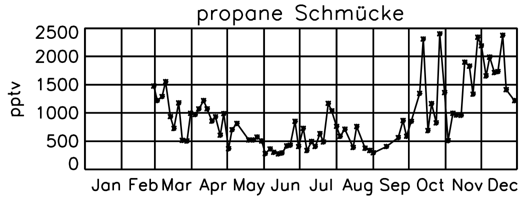
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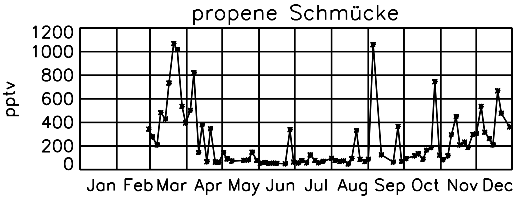
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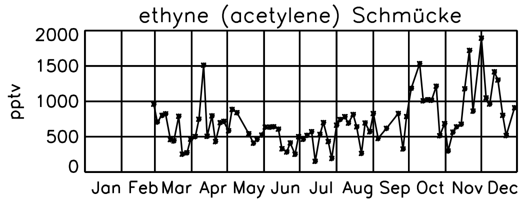
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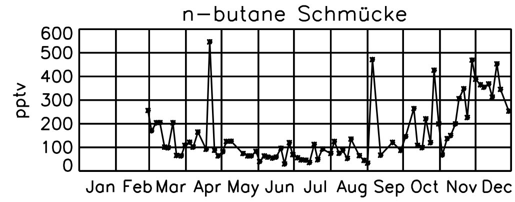
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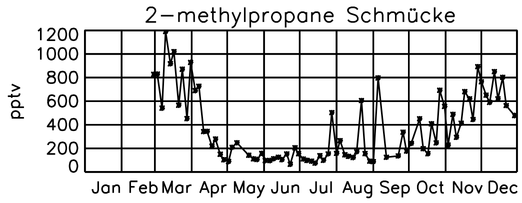
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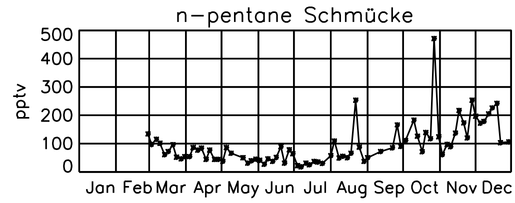
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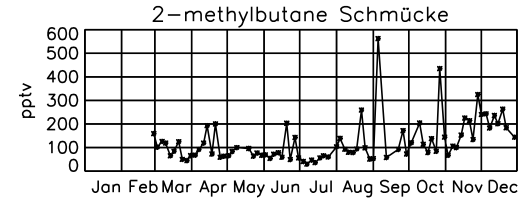
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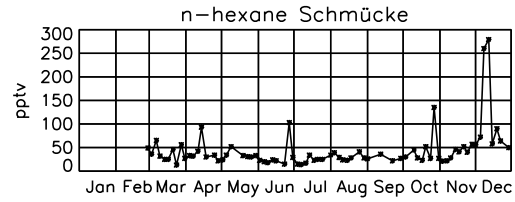
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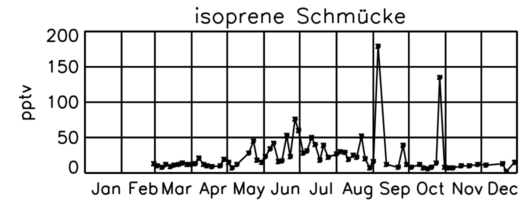
isoprene Schmücke
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pptv
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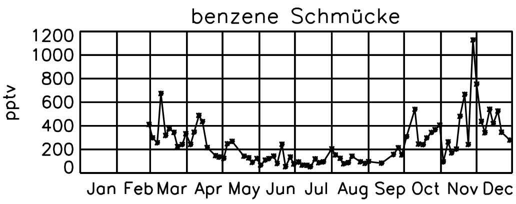
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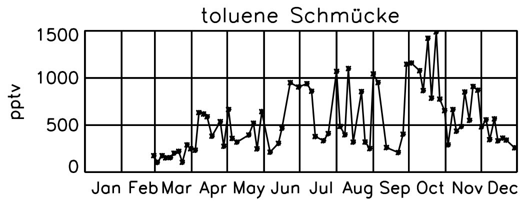
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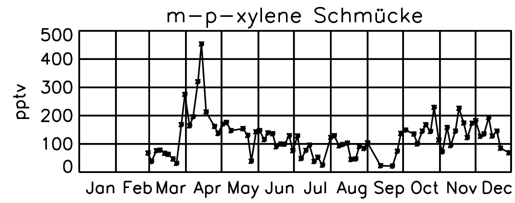
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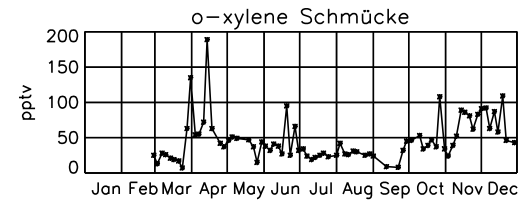
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pptv
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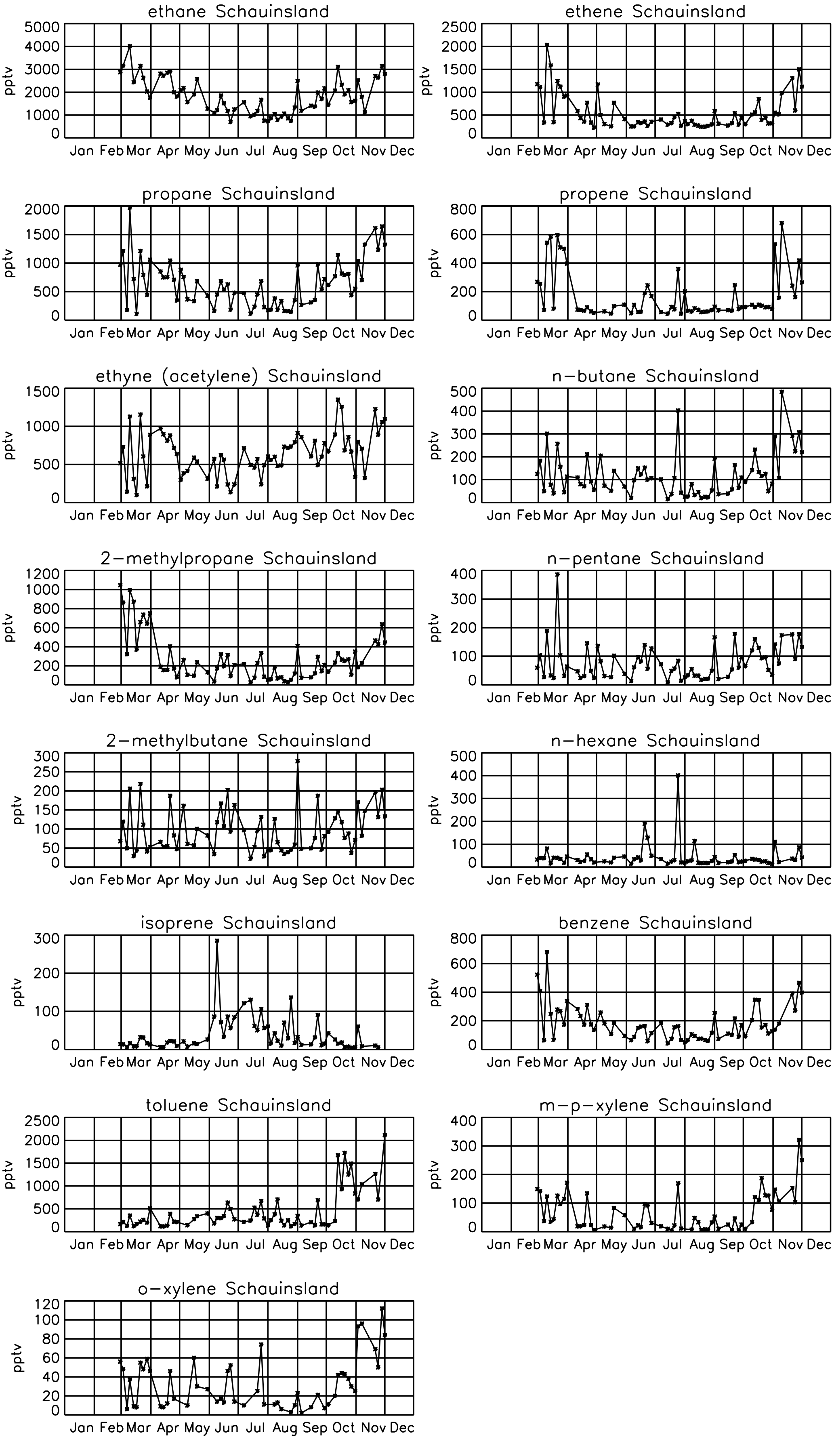
ethane Schauinsland
ethene Schauinsland
propane Schauinsland
propene Schauinsland
ethyne (acetylene) Schauinsland
n−butane Schauinsland
2−methylpropane Schauinsland
n−pentane Schauinsland
2−methylbutane Schauinsland
n−hexane Schauinsland
isoprene Schauinsland
benzene Schauinsland
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pptv
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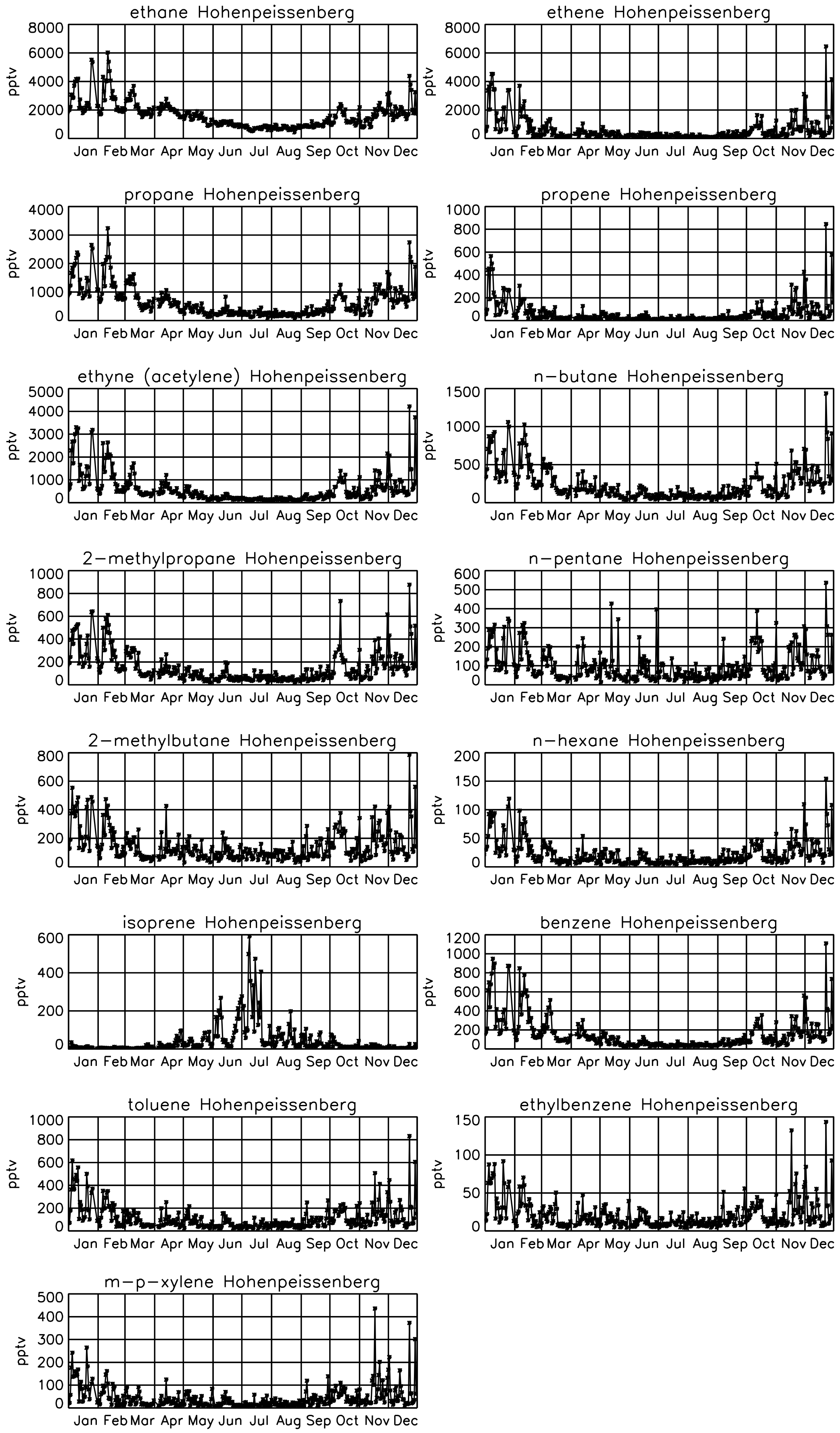
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ethene Hohenpeissenberg
propane Hohenpeissenberg
propene Hohenpeissenberg
ethyne (acetylene) Hohenpeissenberg
n−butane Hohenpeissenberg
2−methylpropane Hohenpeissenberg
n−pentane Hohenpeissenberg
2−methylbutane Hohenpeissenberg
n−hexane Hohenpeissenberg
isoprene Hohenpeissenberg
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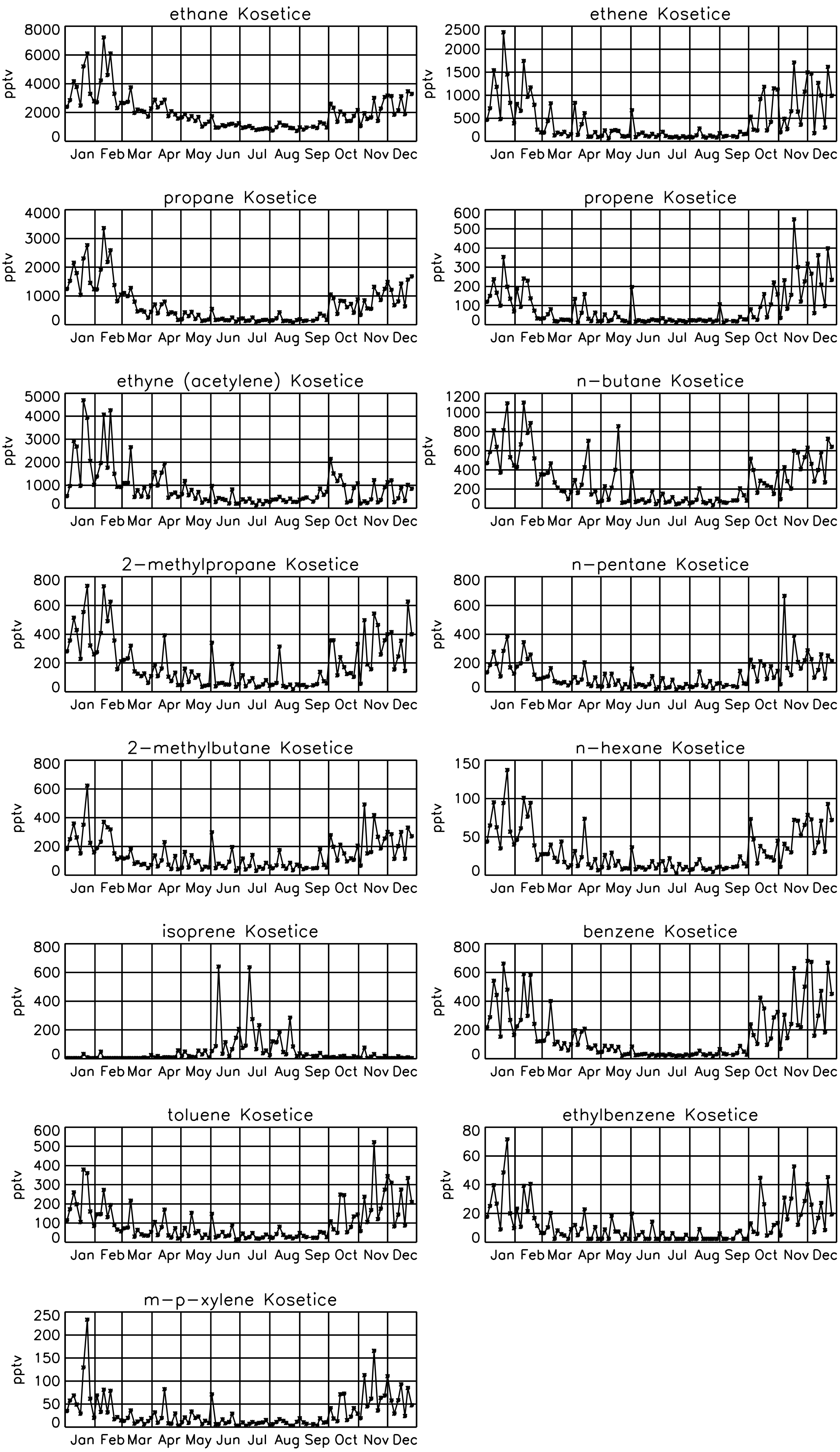
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ethene Kosetice
propane Kosetice
propene Kosetice
ethyne (acetylene) Kosetice
n−butane Kosetice
2−methylpropane Kosetice
n−pentane Kosetice
2−methylbutane Kosetice
n−hexane Kosetice
isoprene Kosetice
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toluene Kosetice
ethylbenzene Kosetice
m−p−xylene Kosetice
pptv
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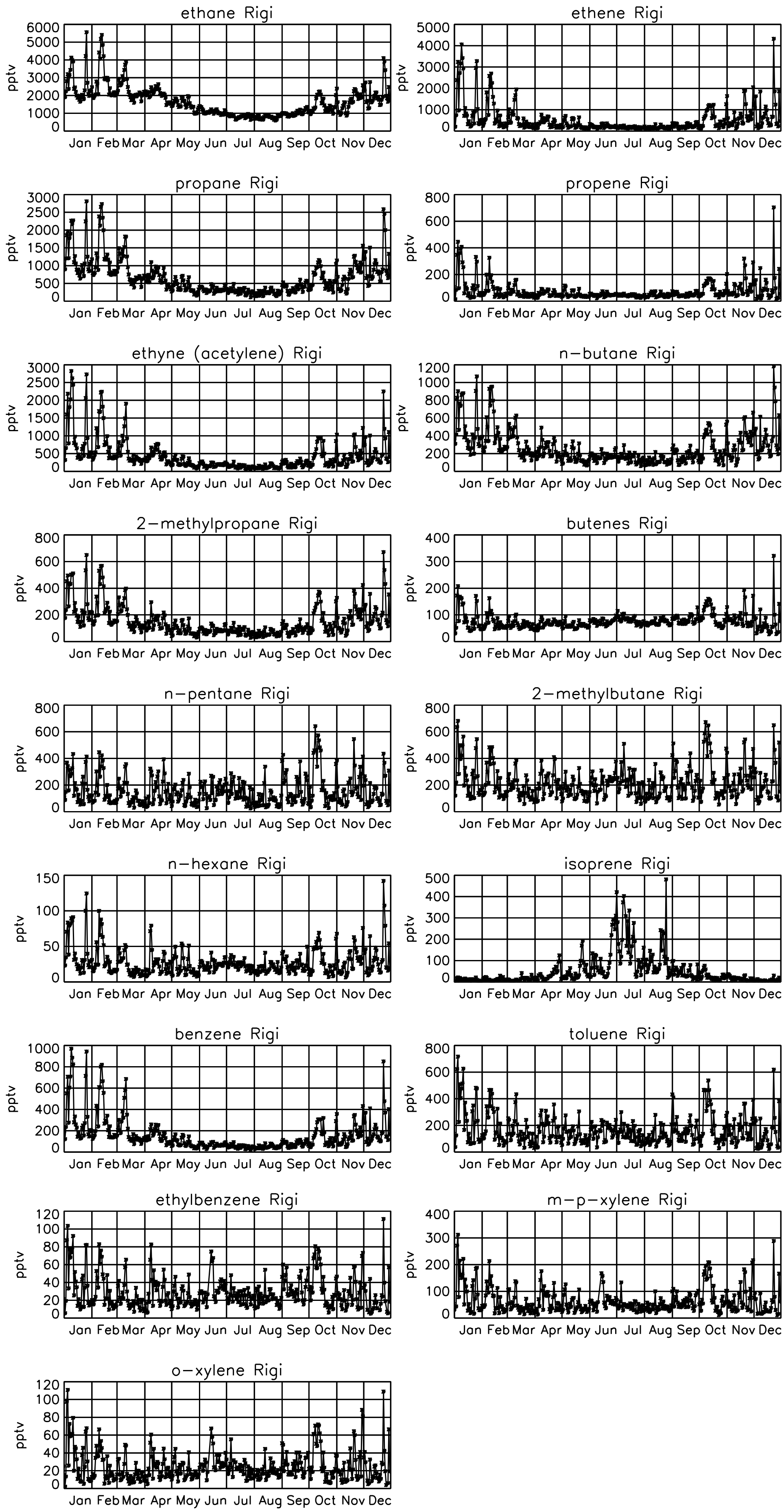
ethane Rigi
ethene Rigi
propane Rigi
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ethyne (acetylene) Rigi
n−butane Rigi
2−methylpropane Rigi
butenes Rigi
n−pentane Rigi
2−methylbutane Rigi
n−hexane Rigi
isoprene Rigi
benzene Rigi
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o−xylene Rigi
pptv
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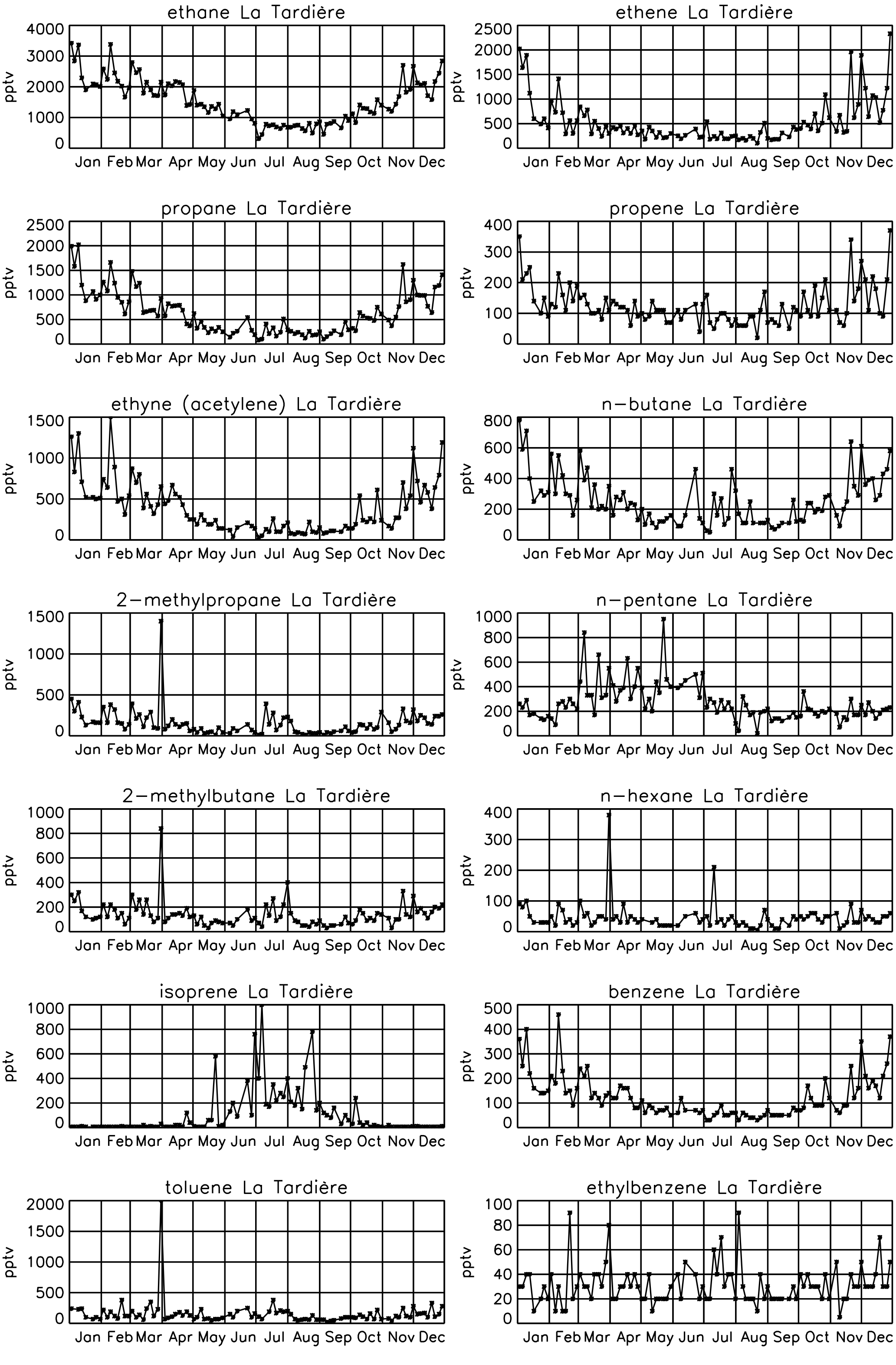
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ethene La Tardière
propane La Tardière
propene La Tardière
ethyne (acetylene) La Tardière
n−butane La Tardière
2−methylpropane La Tardière
n−pentane La Tardière
2−methylbutane La Tardière
n−hexane La Tardière
isoprene La Tardière
benzene La Tardière
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pptv
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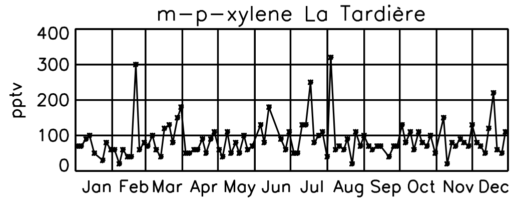
m−p−xylene La Tardière
pptv
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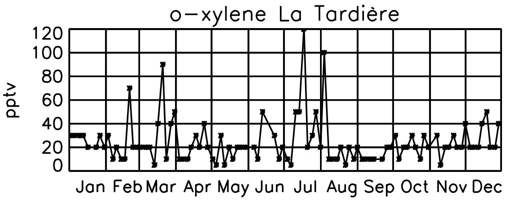
o−xylene La Tardière
pptv
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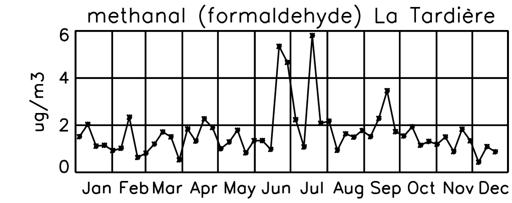
methanal (formaldehyde) La Tardière
ug/m3
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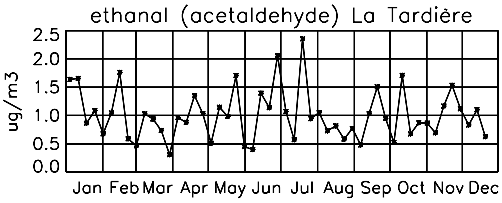
ethanal (acetaldehyde) La Tardière
ug/m3
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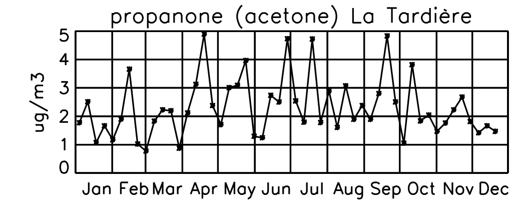
propanone (acetone) La Tardière
ug/m3
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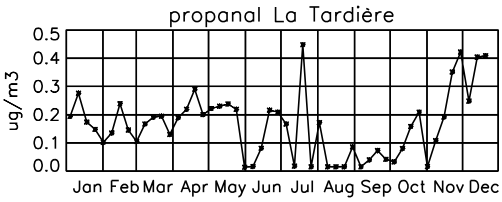
propanal La Tardière
ug/m3
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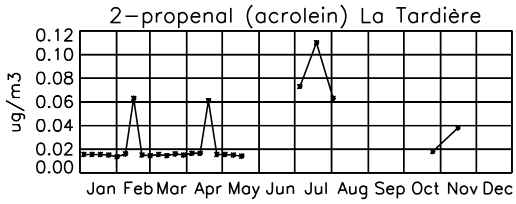
2−propenal (acrolein) La Tardière
ug/m3
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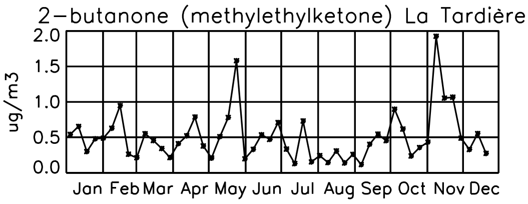
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ug/m3
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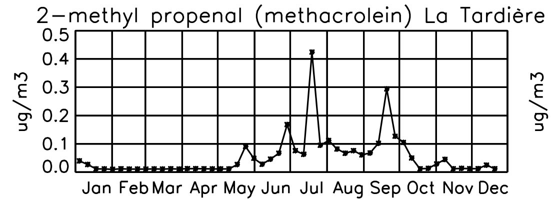
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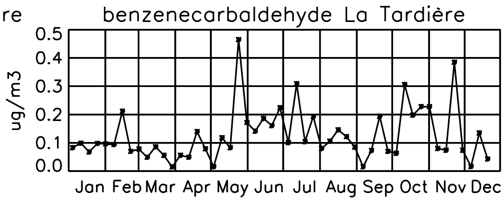
benzenecarbaldehyde La Tardière
ug/m3
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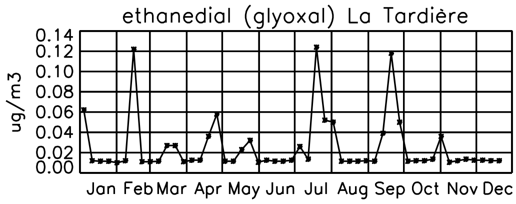
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ug/m3
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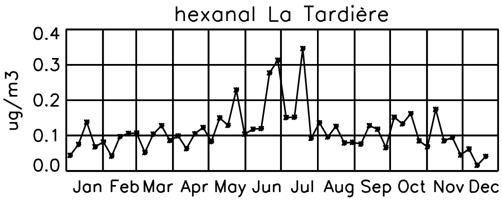
hexanal La Tardière
ug/m3
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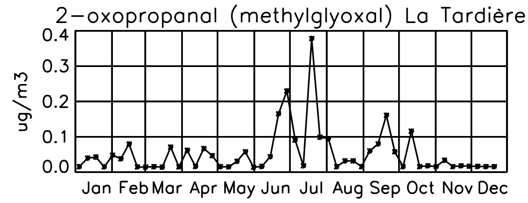
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ug/m3
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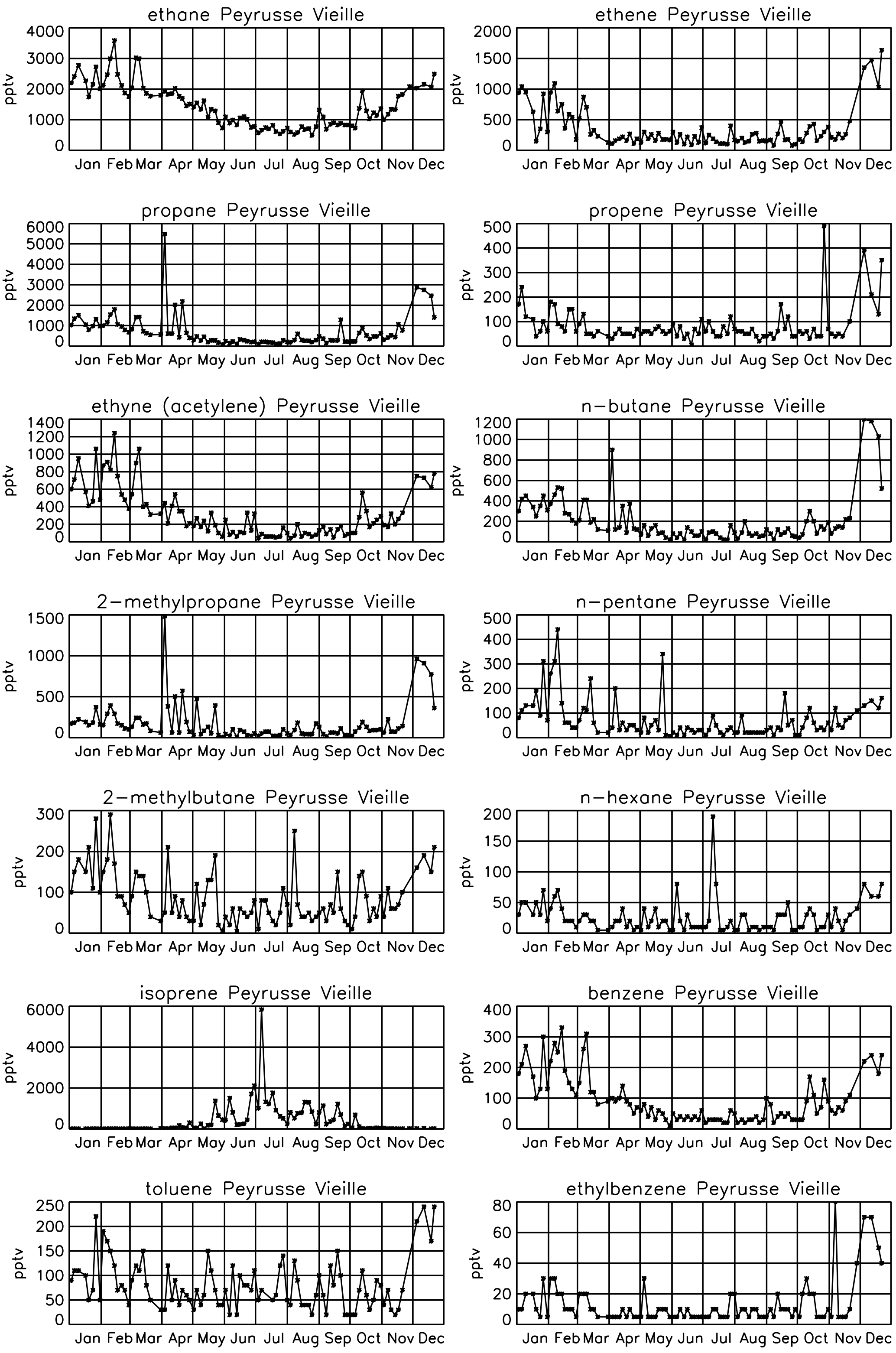
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ethene Peyrusse Vieille
propane Peyrusse Vieille
propene Peyrusse Vieille
ethyne (acetylene) Peyrusse Vieille
n−butane Peyrusse Vieille
2−methylpropane Peyrusse Vieille
n−pentane Peyrusse Vieille
2−methylbutane Peyrusse Vieille
n−hexane Peyrusse Vieille
isoprene Peyrusse Vieille
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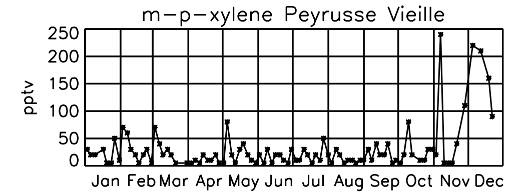
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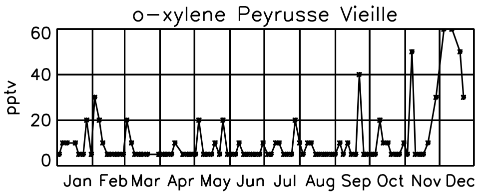
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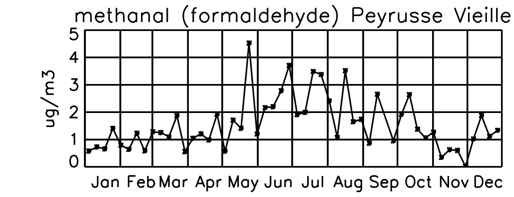
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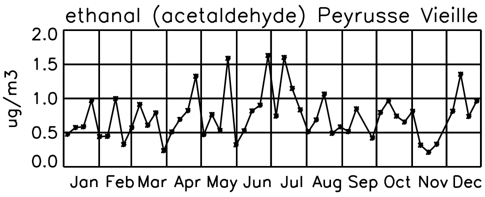
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ug/m3
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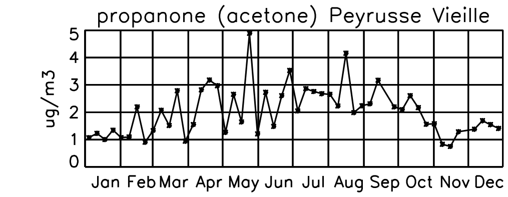
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ug/m3
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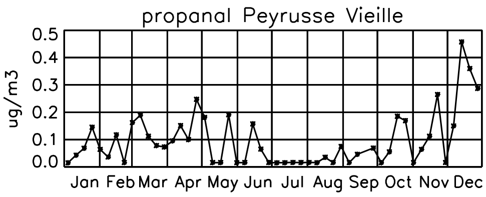
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ug/m3
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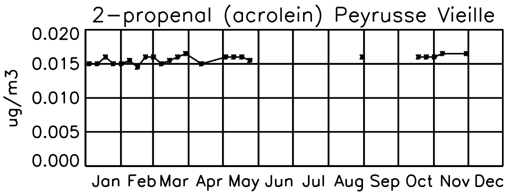
2−propenal (acrolein) Peyrusse Vieille
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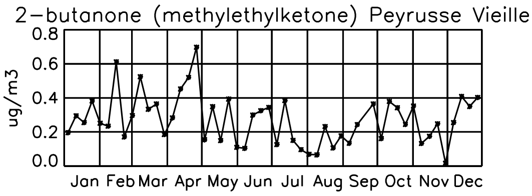
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ug/m3
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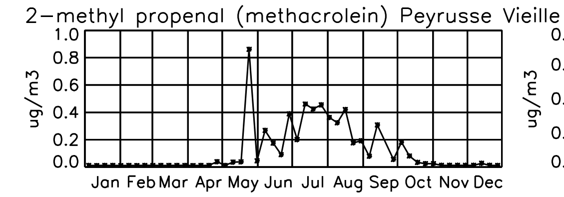
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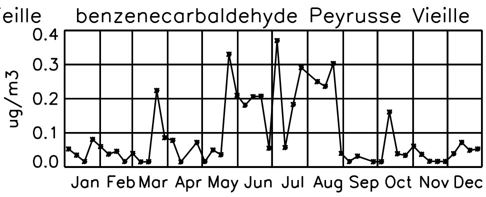
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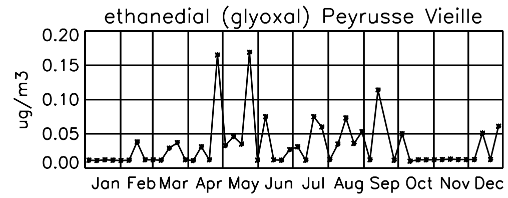
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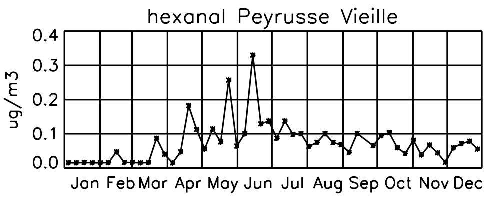
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ug/m3
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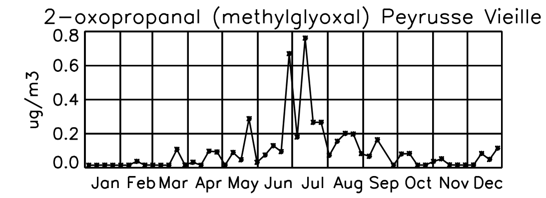
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ug/m3
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec