Supplement for

Possible controls on Arctic clouds by natural aerosols from long-range transport of biogenic emissions and ozone depletion events

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Table S1: Campaign (n=7771) mean, median, 25%, and 75% percentiles for all detected signals that were above the limit of detection for at least 3% of all measurements.

m/Q	possible attribution	mean	med	p25	p75
27.021		2.4	1.9	-6.9	11
33.021	methanol	191	171	130	230
34.019	methanol	17	15	-11	44
41.031		51	43	34	52
42.025	acetonitrile	20	20	9.0	31
43.011		42	38	28	48
44.989	acetaldehyde	354	321	164	487
45.987	NO2+, mostly PAN	78	75	59	92
47.013	formic acid	29	27	-3.1	56
48.981		0.9	0.9	-2.0	3.6
49.014		0.8	0.7	-2.3	3.7
51.001		1.6	1.6	-1.9	5.0
55.041		18	13	4.7	23
56.051		2.1	1.9	-0.9	4.8
57.023		4.9	1.9	-2.6	6.2
57.065		39	32	25	41
58.033		3.7	3.4	0.7	6.1
59.05	acetone	561	523	434	658
59.99		1.1	1.1	-1.4	3.7
60.049	acetone	18	18	13	23
61.03	acetic acid	16	15	4.7	26
62.03		2.3	1.5	-1.1	4.3
63.009	DMS	10	8.9	1.7	16
63.984		0.9	0.9	-1.9	3.6

65.019		3.2	3.1	0.7	5.7
66.964		0.7	0.7	-1.4	2.8
67.056		1.5	0.7	-1.4	3.0
69.069	isoprene	15	12	7.3	17
70.078		0.9	0.8	-1.3	3.0
71.053		4.5	2.4	-0.6	5.4
73.062	MEK	118	105	89	139
74.033		4.3	4.2	1.5	6.9
75.043	proprionic acid	9.2	8.9	5.7	12
76.94		0.3	0.3	-1.7	2.2
77.023		1.2	1.1	-0.8	3.2
79.055	benzene	63	62	57	67
80.059		4.3	4.1	2.2	6.2
80.991		13	13	10	15
81.062		3.8	2.9	0.8	4.9
82.959		6.7	6.6	4.5	8.7
83.081		7.9	6.0	3.0	9.2
84.946		1.1	1.2	-0.9	3.2
84.967		0.4	0.5	-1.7	2.6
85.056		1.5	0.8	-1.9	3.5
87.055	pentanone	16	14	10	20
88.064		1.0	0.9	-1.1	2.9
91.043		3.1	1.8	-10.6	14
93.07	toluene	10	8.4	5.7	11
95.044		2.2	1.2	-1.5	3.8
96.998		1.5	1.6	-2.1	5.0
97.094		3.8	2.4	-1.0	6.0
99.019		3.6	3.4	0.6	6.2
99.076		2.1	1.8	-0.7	4.3
100.947		11	11	7.6	14

101.033		2.7	2.4	-1.5	6.3
102.948		5.8	5.9	1.2	11
104.948		1.5	1.4	-1.0	3.9
105.049		1.0	0.4	-1.4	2.3
105.941		5.6	5.4	-2.1	13
106.07		0.7	0.4	-2.9	3.9
106.946		4.5	3.6	-4.1	12
107.047		2.4	0.4	-5.6	6.6
107.953		8.4	7.9	-10	25
108.072		1.9	0.2	-11	12
109.089		4.8	3.7	0.8	7.0
111.113		5.6	4.5	1.5	7.7
112.111		0.6	0.5	-1.2	2.2
113.041		0.9	0.8	-1.4	3.0
113.112		1.1	1.0	-1.0	3.0
115.05		2.6	2.4	-0.1	5.0
116.911		56	56	52	60
118.928		52	52	47	57
120.085		0.6	0.2	-2.5	3.3
120.941		16	16	13	19
121.065		4.7	1.6	-1.1	4.2
121.958		1.8	1.7	-0.4	3.8
122.091		1.4	1.1	-0.6	2.8
122.959		2.0	2.0	0.1	3.8
123.097		1.4	0.9	-0.9	2.8
124.957		1.8	1.6	-2.0	5.4
125.119		1.7	1.3	-0.9	3.6
129.087		0.7	0.4	-1.7	2.4
134.944		0.7	0.7	-1.0	2.4
135.084		3.2	1.1	-1.1	3.3

137.123	monoterpenes	1.4	1.0	-0.7	2.7
138.119		0.2	0.2	-1.4	1.7
139.129	nopinone	0.6	0.3	-1.4	2.1
141.085		0.6	0.4	-1.2	2.0
143.109		1.2	0.7	-1.2	2.8
149.054		1.8	1.0	-1.1	3.1
151.131		0.6	0.3	-1.4	2.2
153.098		0.4	0.3	-1.3	1.9
159.093		1.0	0.9	-1.3	3.1
160.909		0.5	0.4	-1.3	2.2
161.097		1.3	0.9	-1.9	3.8
165.157		0.6	0.4	-1.3	2.1
175.102		0.5	0.3	-1.4	2.1
177.167		1.4	1.0	-1.6	3.9
179.179		0.7	0.5	-1.1	2.1
180.937		1.3	1.1	-0.6	2.9
181.079		0.5	0.5	-1.3	2.2
182.939		1.1	1.0	-0.6	2.7
205.184	sesquiterpenes	0.4	0.4	-1.2	1.9
330.171		3.0	2.2	-1.8	6.8
355.07	D5	0.3	0.2	-1.0	1.5
358.201		1.2	1.1	-1.6	3.8

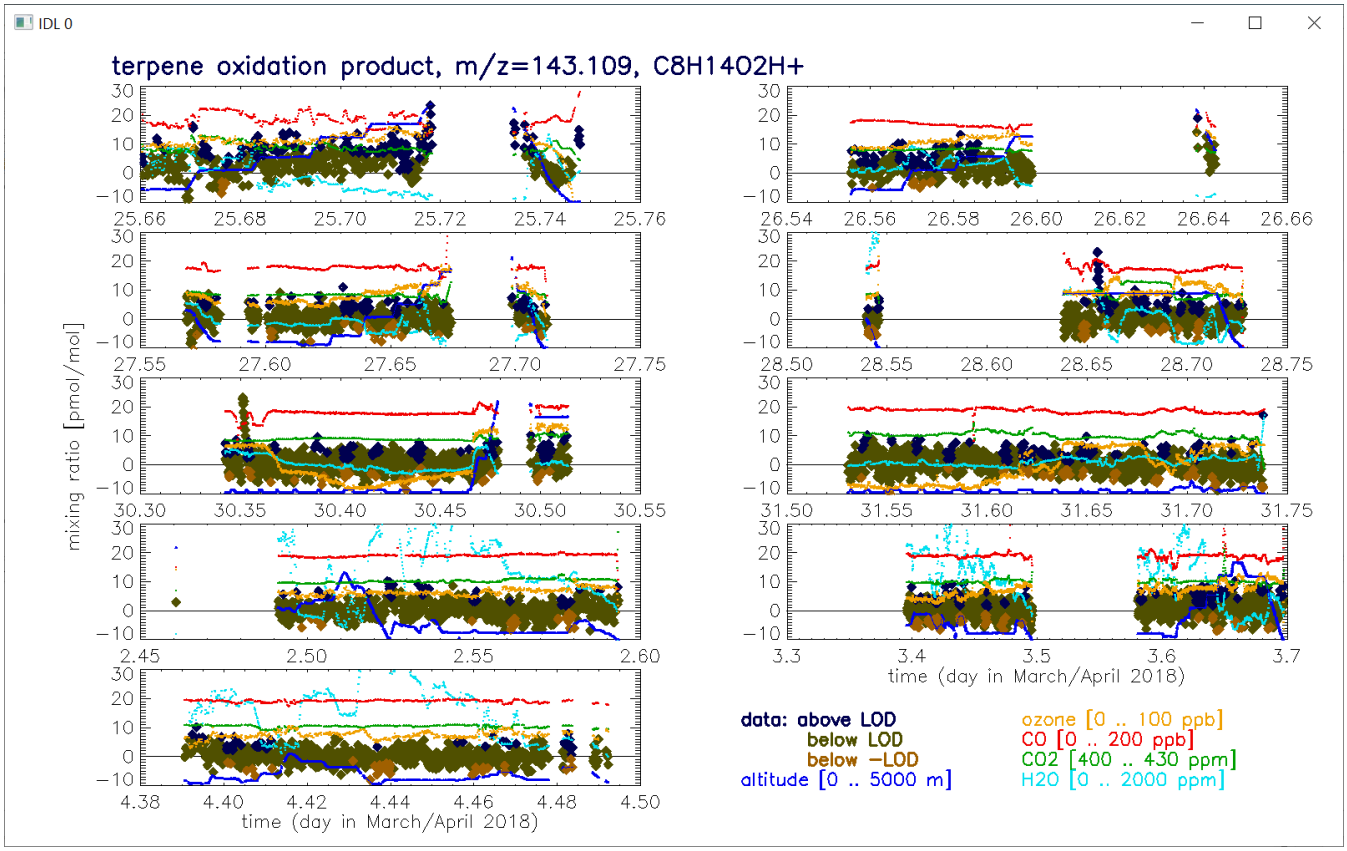
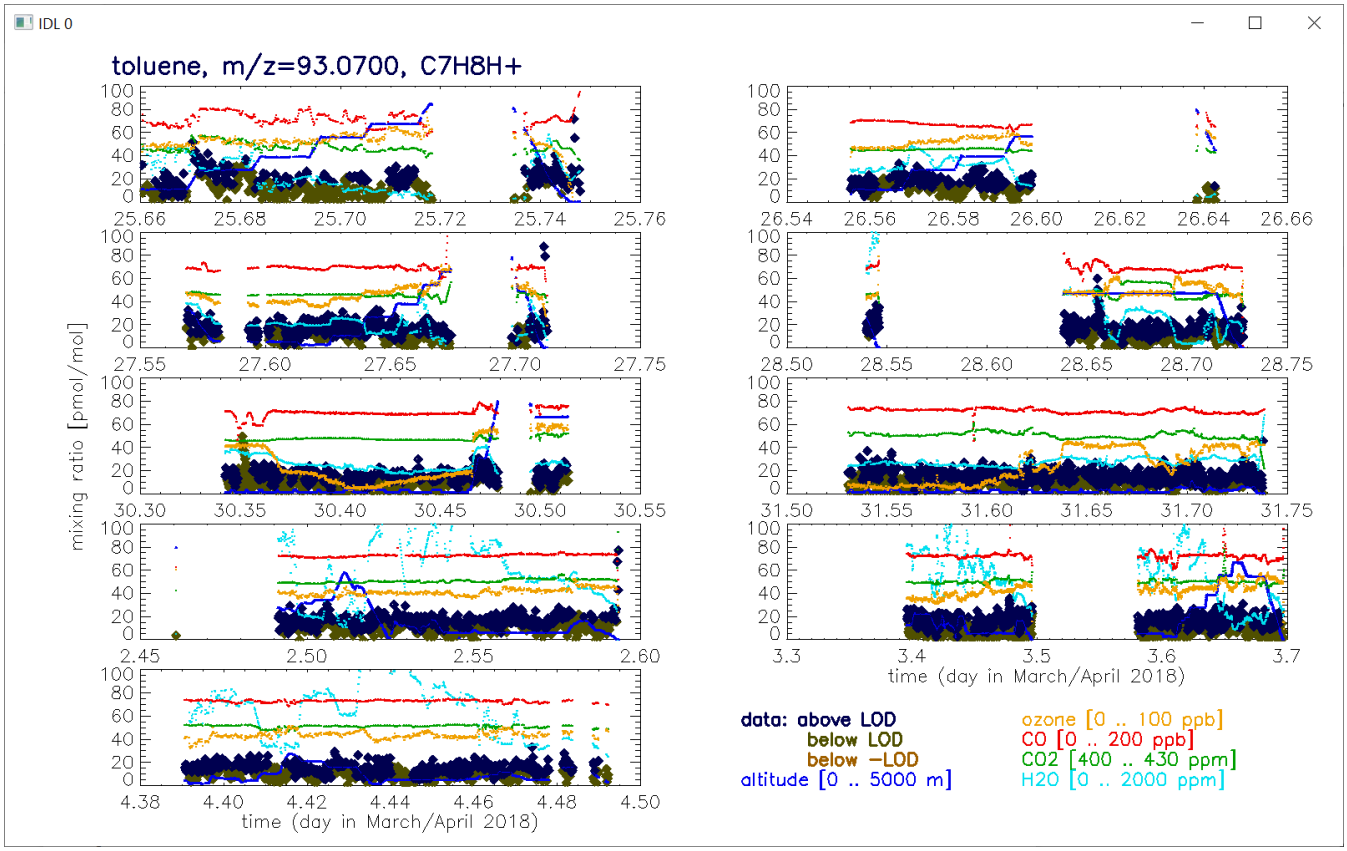


Figure S1: Data and presentation as in Figure 3 but for the signal detected at 143.109 Th. The campaign mean (median) mixing ratio was 1.2 (0.7) pmol/mol for this ion. Measured mixing ratios generally did not emerge above the LOD. The measurements plotted in black (n=812) were above the LOD, and values plotted in brown (n=315) were negative below -LOD. The fraction above LOD was calculated by subtracting the 'brown' points from the 'black' points and dividing the result by the total number of measurements (n=7771). The result is 6.4 % for this ion.



45 **Figure S2:** Data and presentation as in Figure 3 but for toluene.

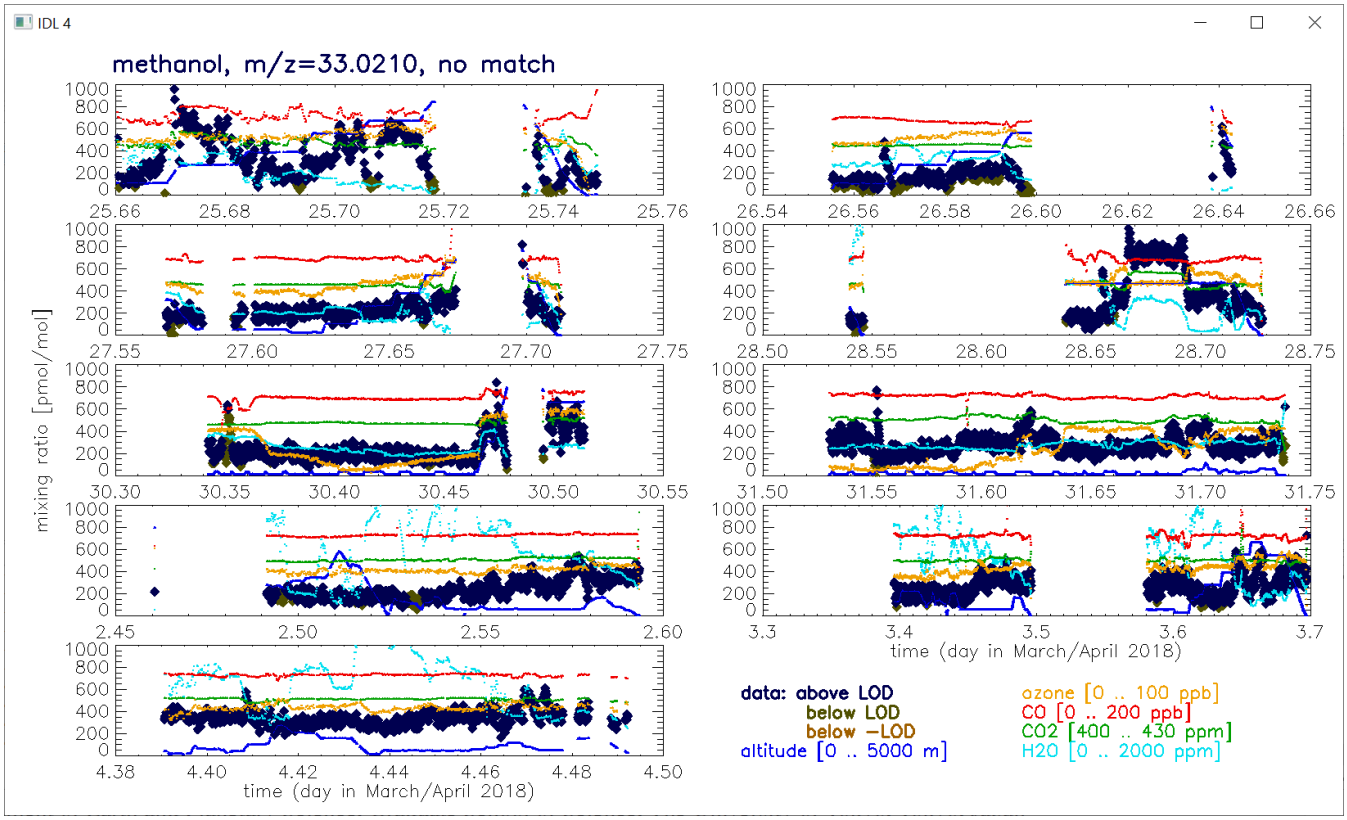


Figure S3: Data and presentation as in Figure 3 but for methanol.

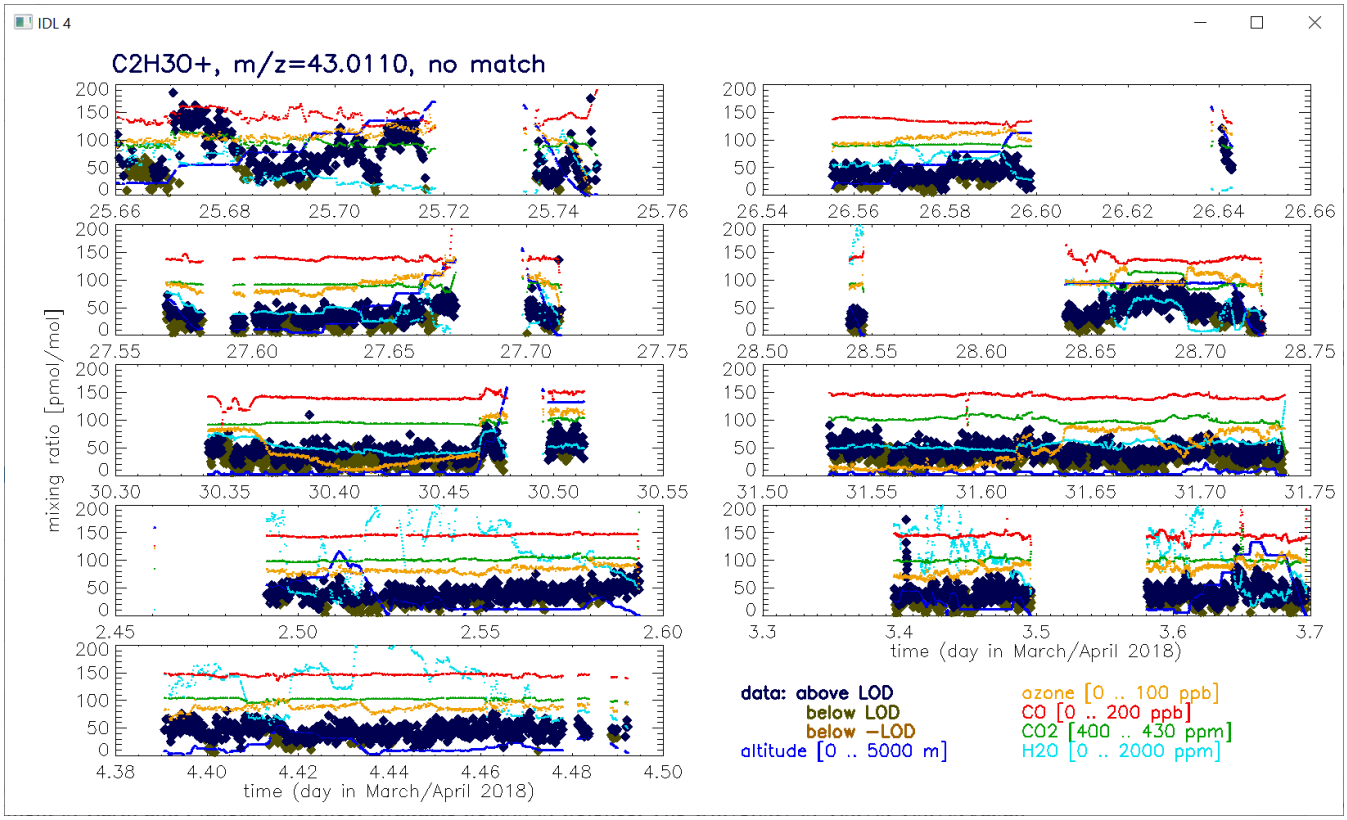


Figure S4: Data and presentation as in Figure 3 but for the signal detected at 43.011 Th.

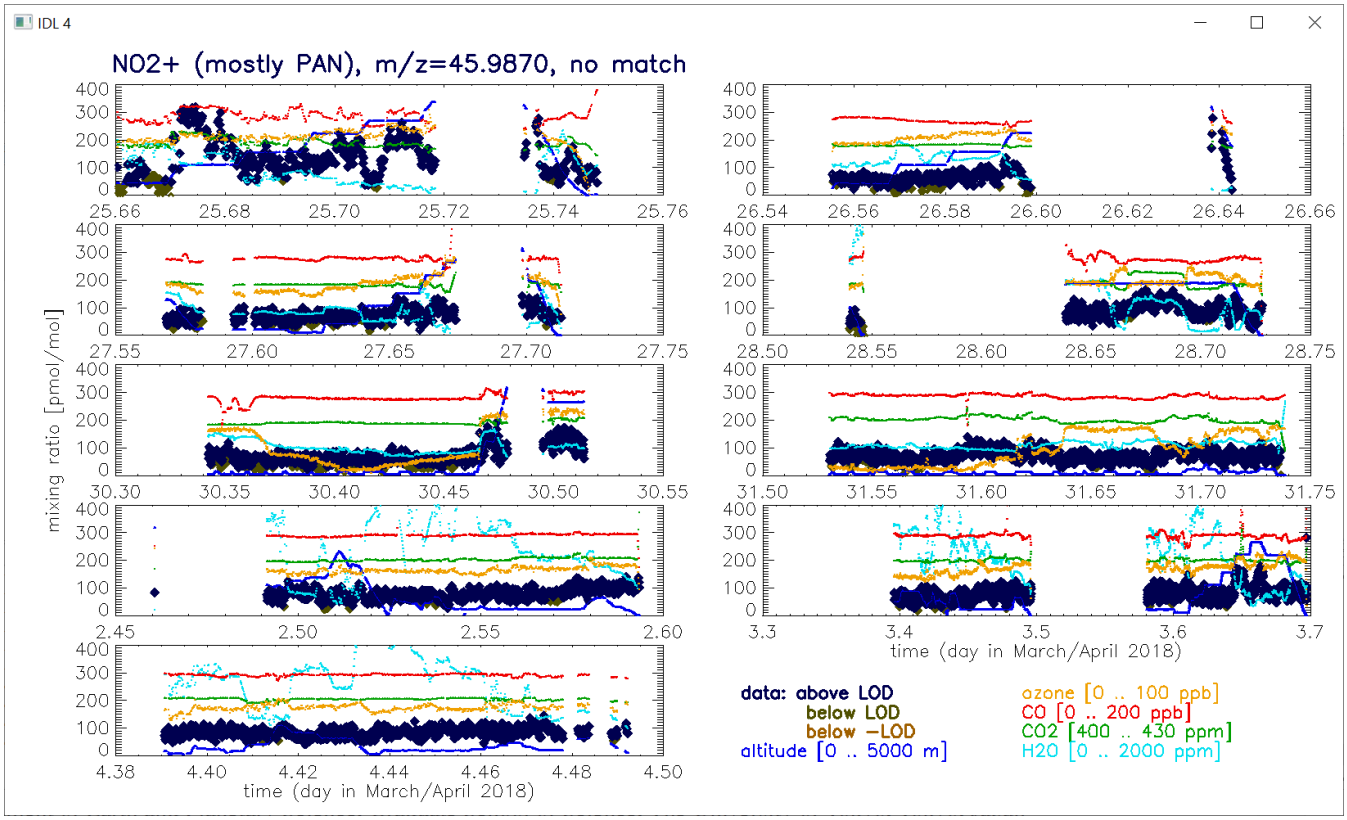


Figure S5: Data and presentation as in Figure 3 but for NO_2^+ (mostly attributed to PAN).

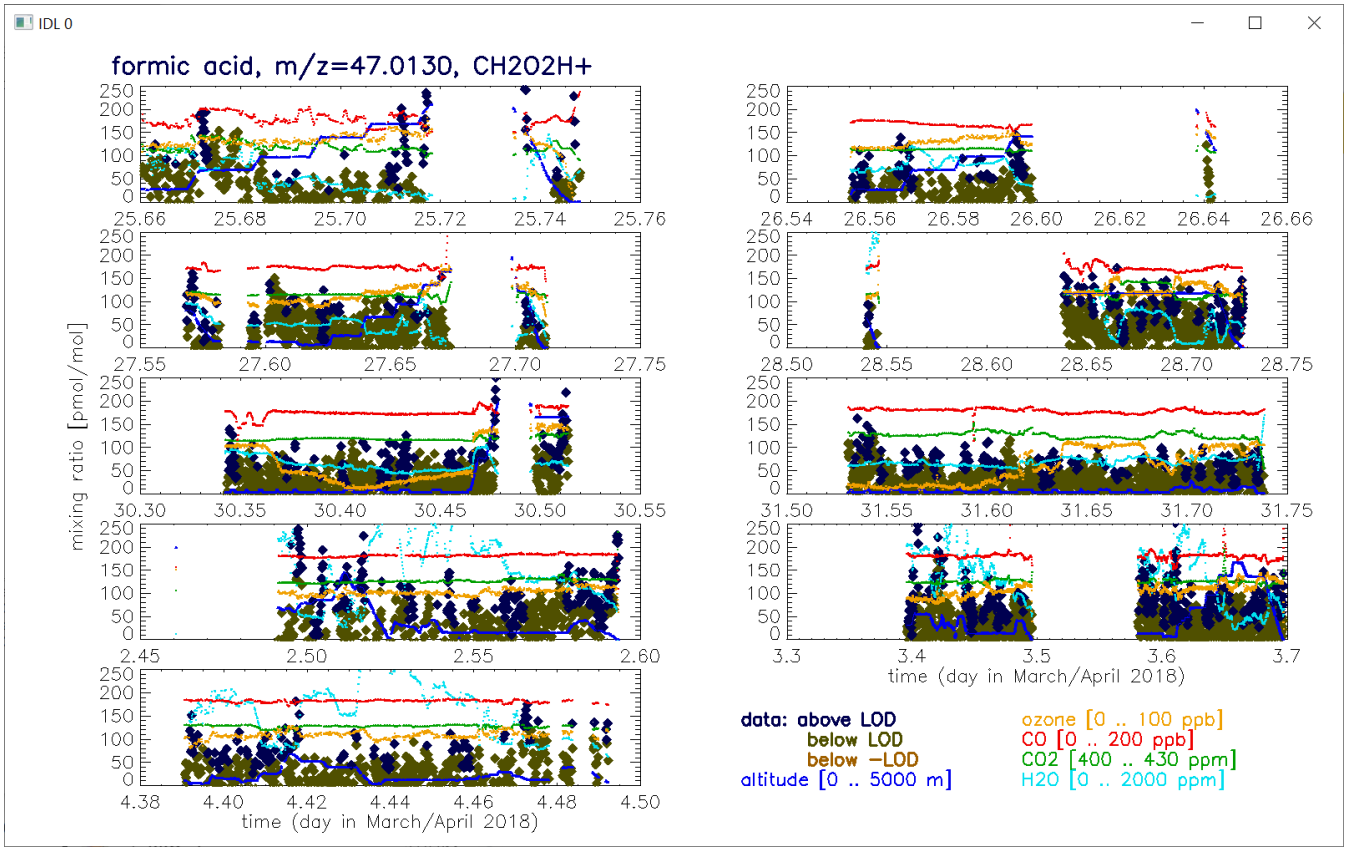
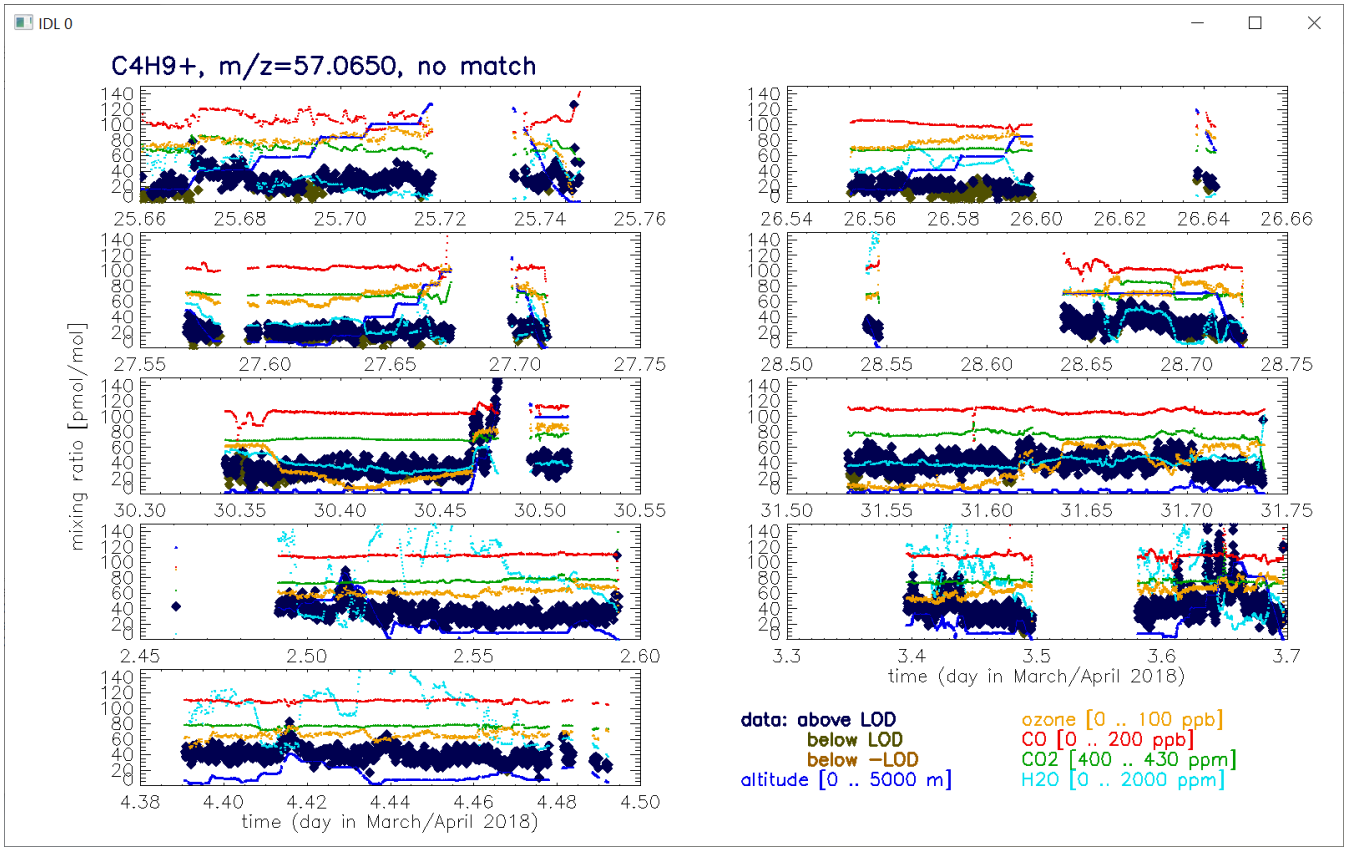


Figure S6: Data and presentation as in Figure 3 but for formic acid.



60 **Figure S7:** Data and presentation as in Figure 3 but for the signal detected at 57.065 Th.

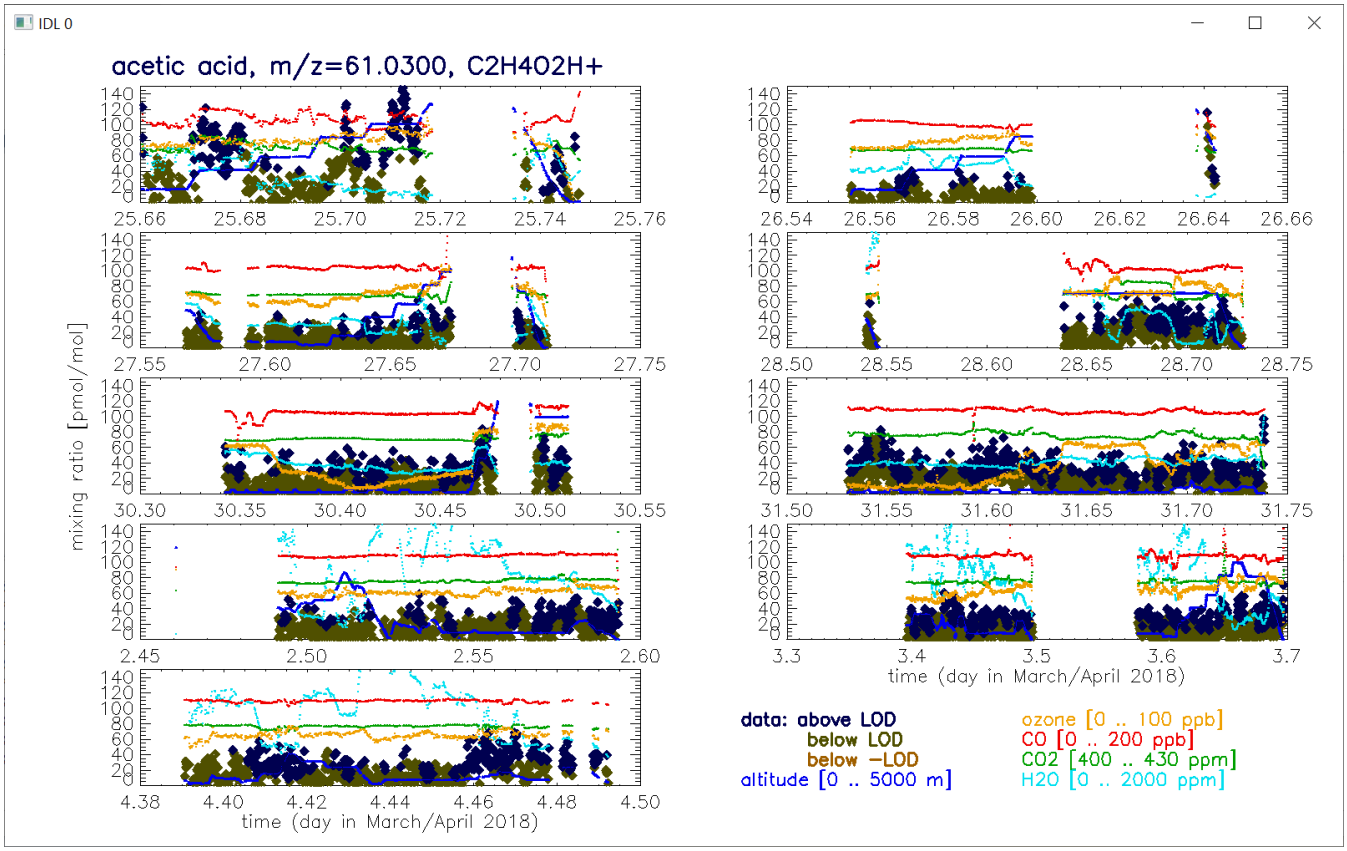


Figure S8: Data and presentation as in Figure 3 but for acetic acid.

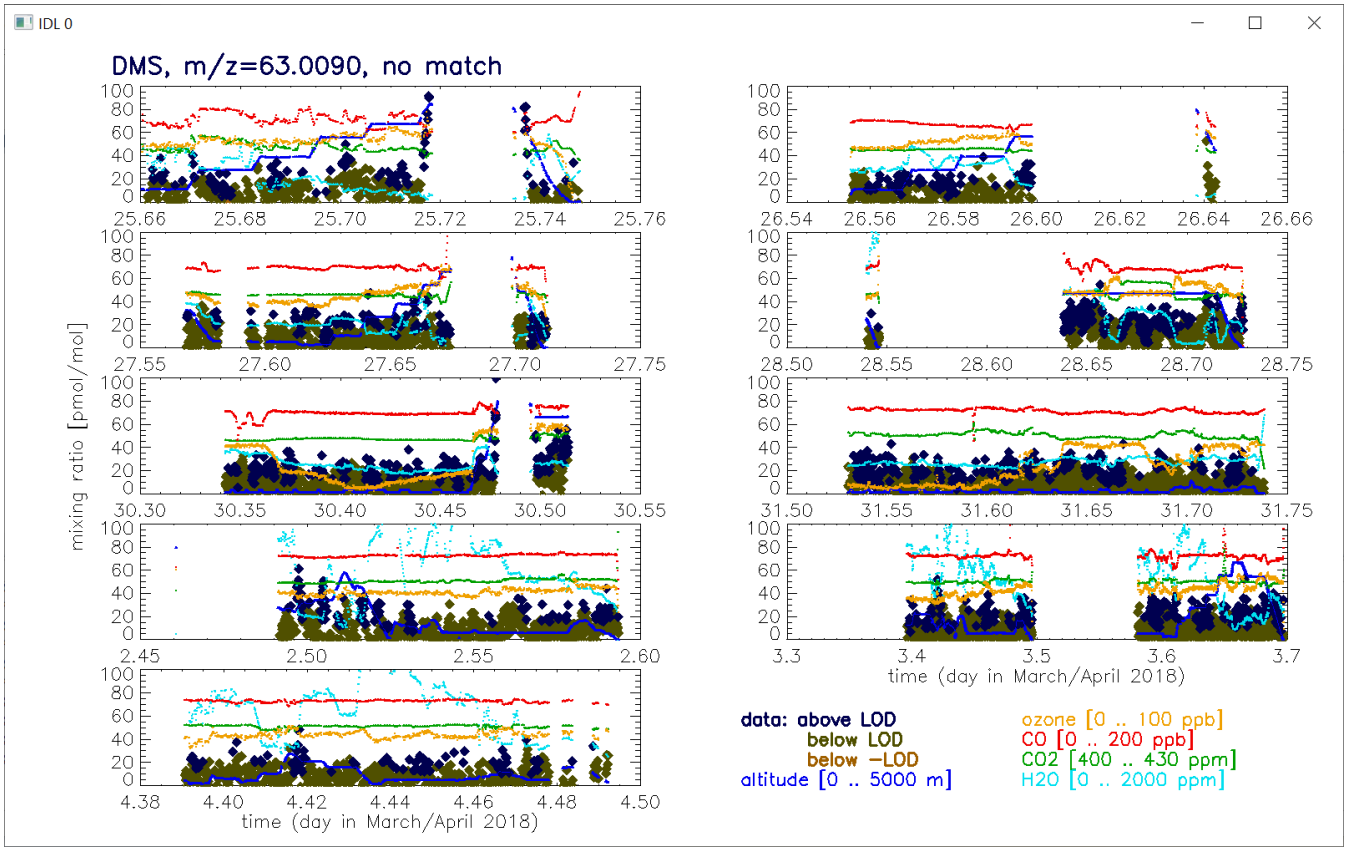


Figure S9: Data and presentation as in Figure 3 but for DMS.

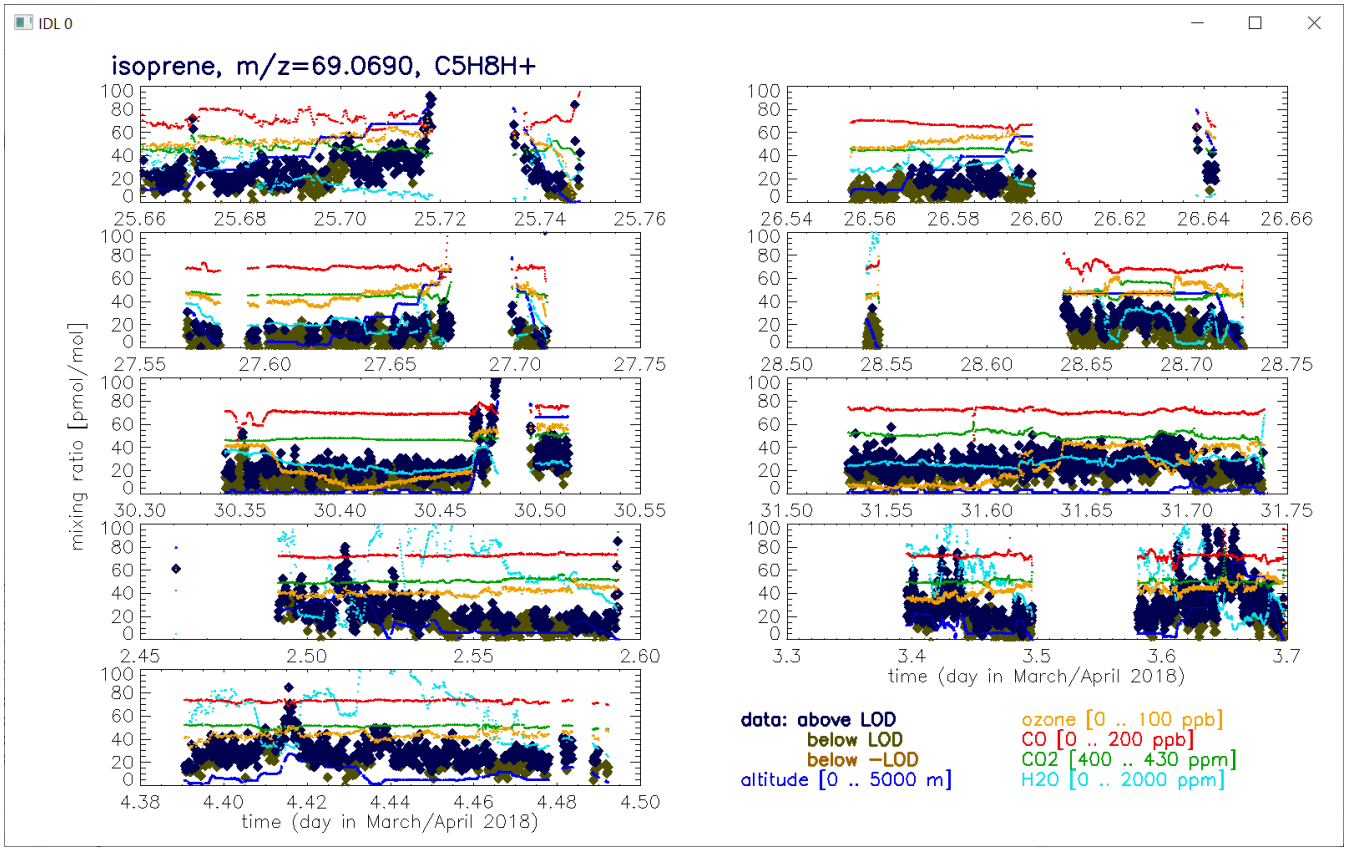


Figure S10: Data and presentation as in Figure 3 but for isoprene.

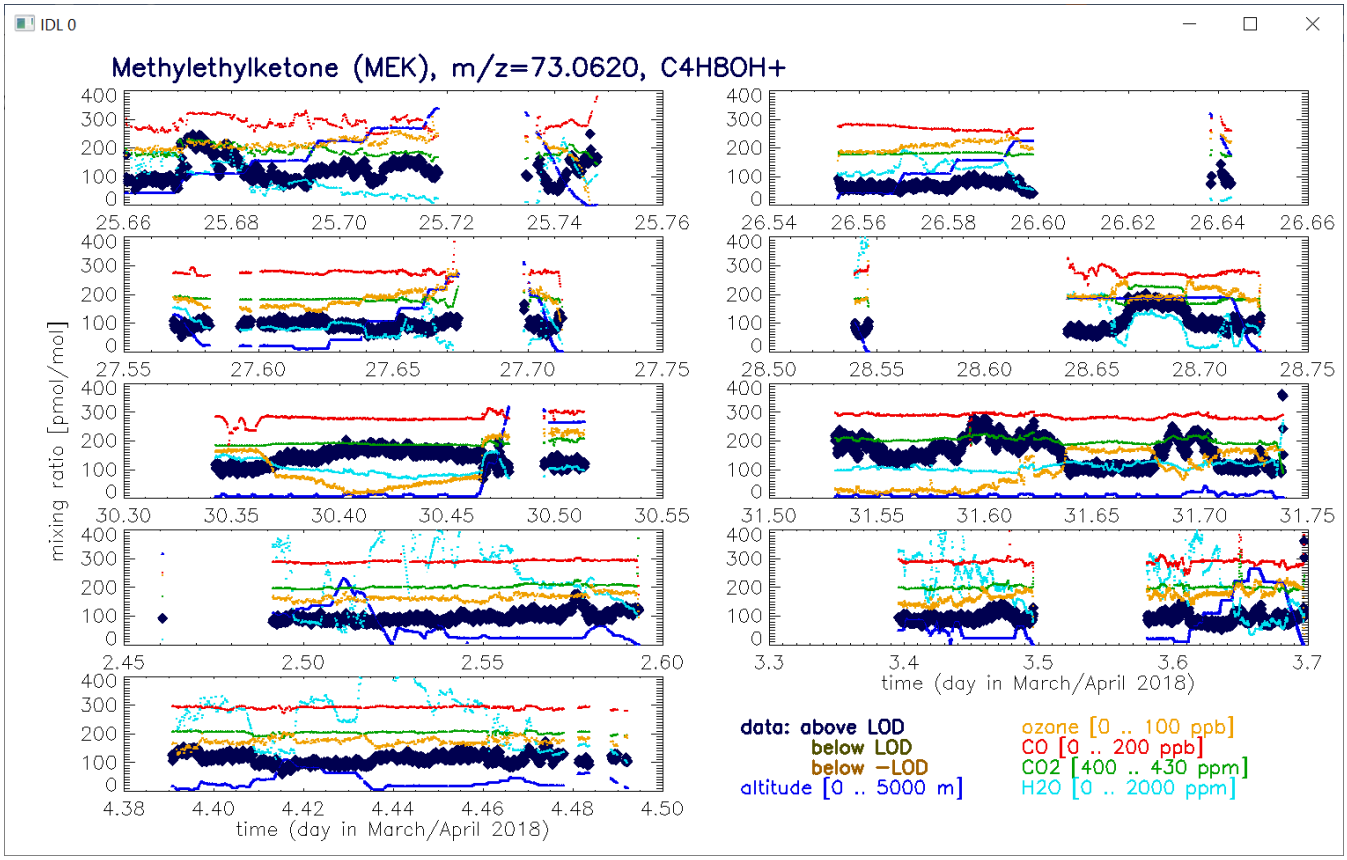


Figure S11: Data and presentation as in Figure 3 but for MEK.

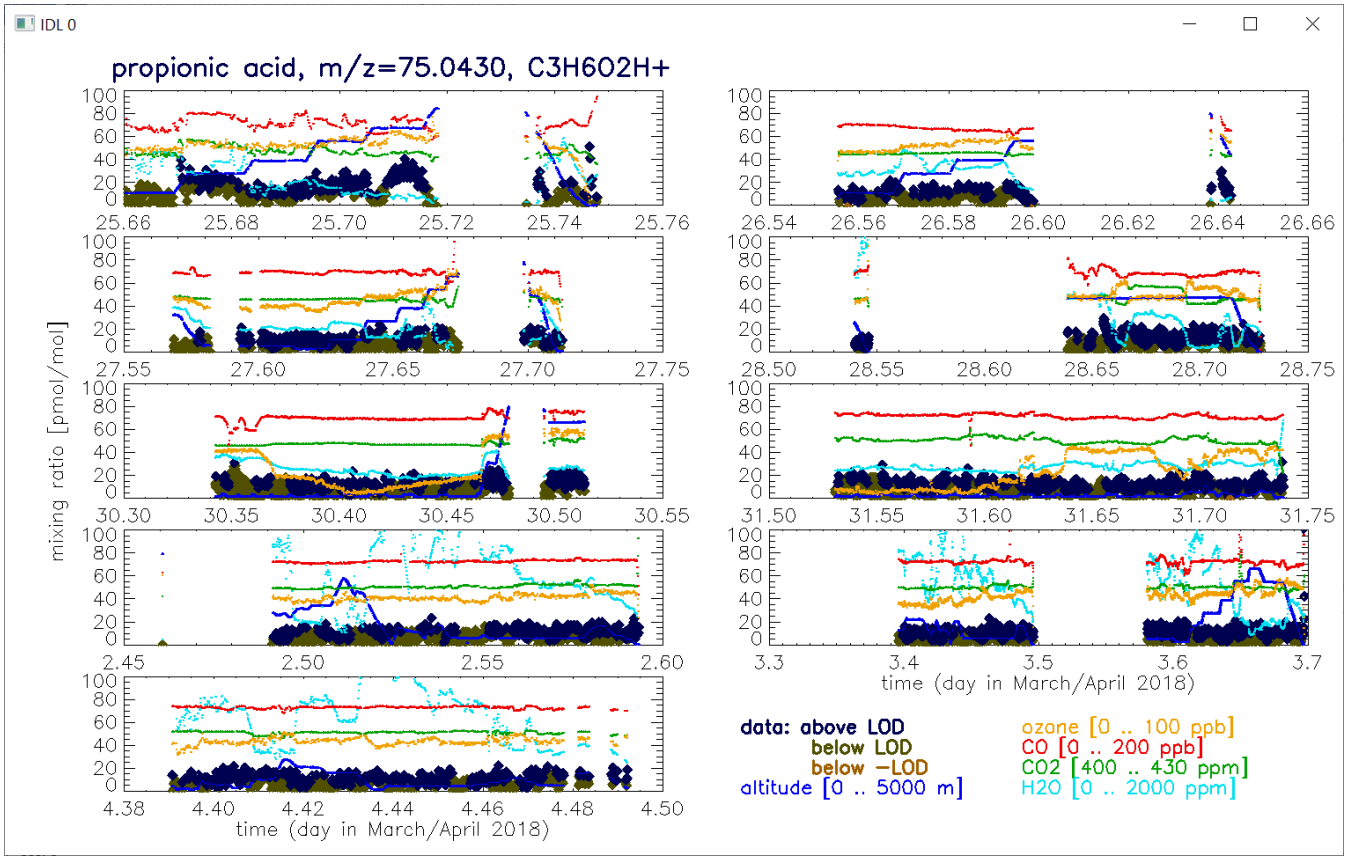


Figure S12: Data and presentation as in Figure 3 but for proprionic acid.

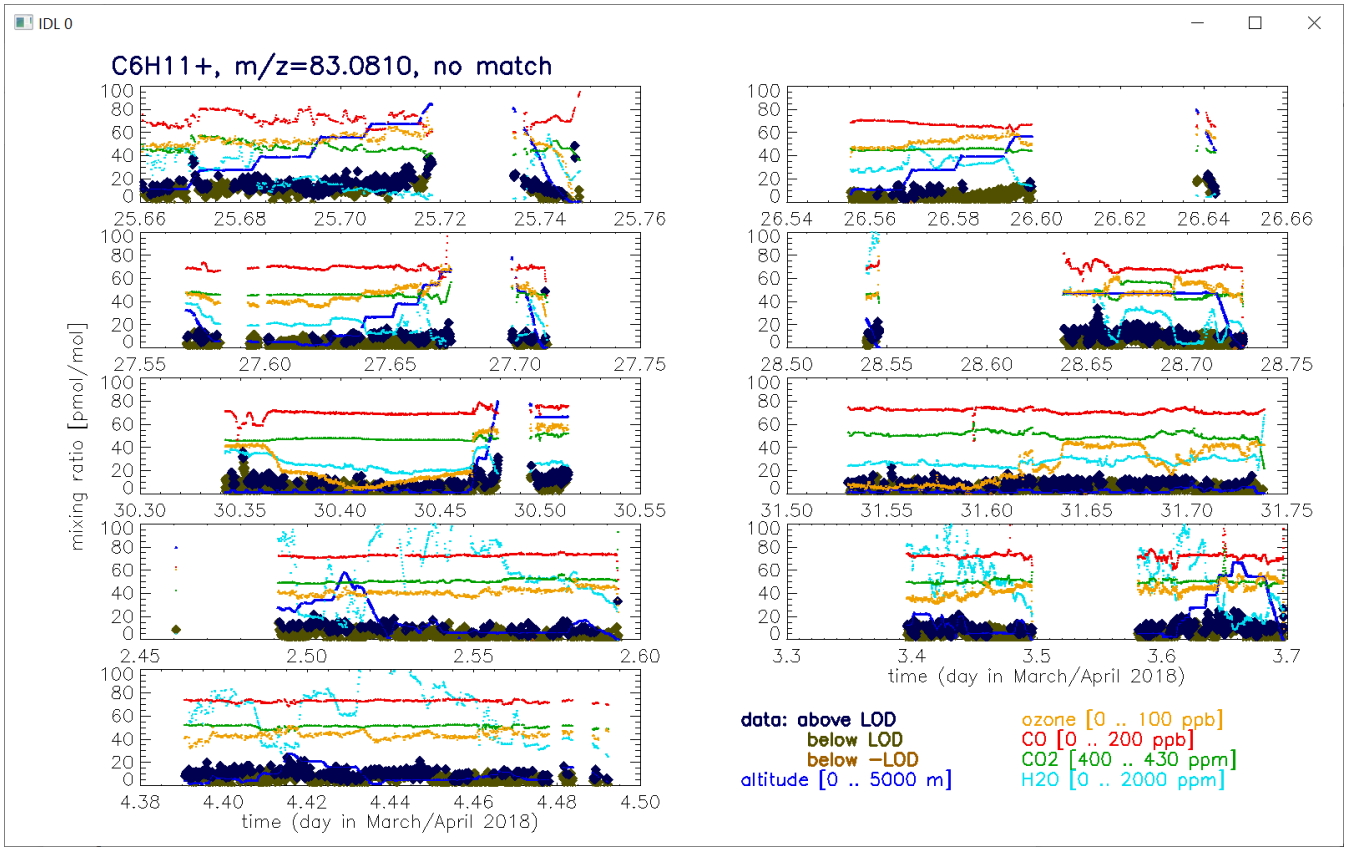


Figure S13: Data and presentation as in Figure 3 but for the signal detected at 83.081 Th.

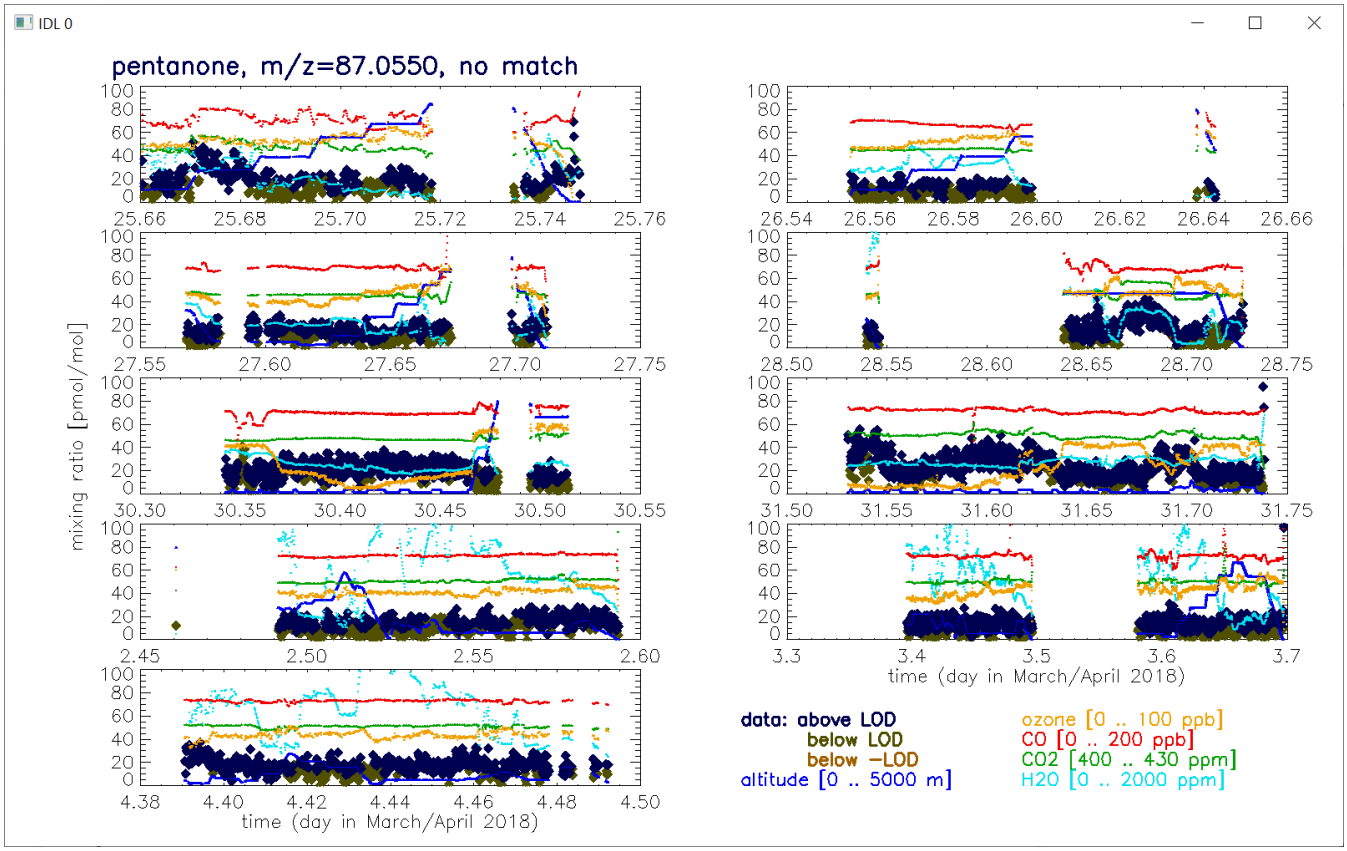


Figure S14: Data and presentation as in Figure 3 but for pentanone.