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Optimization of a gas chromatographic unit for measuring biogenic volatile organic compounds in ambient air

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Supplementary

S1 Composition of NPL calibration standard mixture

Table S1 : Composition of NPL calibration standard mixture (D09 0523, June 2014)

Compounds	nmol/mol	Expanded uncertainty	Compounds	nmol/mol	Expanded uncertainty
ethane	4.22	0.08	isoprene	4.19	0.09
ethene	4.06	0.08	heptane	4.18	0.08
propane	4.25	0.09	benzene	4,00	0.08
propene	4.18	0.08	2.2.4-trimethylpentane	4.15	0.08
2-methylpropane	4.37	0.11	octane	4.2	0.08
butane	4.14	0.08	toluene	3.99	0.1
ethyne	4.3	0.21	ethylbenzene	3.99	0.1
trsn-but-2-ene	4.14	0.08	m-xylene	4.04	0.11
but-1-ene	4.14	0.08	p-xylene	3.98	0.1
ci-but-2-ene	4.19	0.08	o-xylene	3.99	0.1
2-metylbutane	4.21	0.08	1.3.5-trimethylbenzene	4.09	0.11
pentane	4.21	0.08	1.2.4-trimethylbenzene	4.03	0.11
1.3-butadiene	4.13	0.08	1.2.3-trimethylbenzene	4.16	0.11
trans-pent-2-ene	4.13	0.08	α-pinene	3.88	0.08
pent-1-ene	4.14	0.08	β-pinene	3.95	0.2
2-methylpentane	4.23	0.08	limonene	3.99	0.12
hexane	4.15	0.08			

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S2 MnO_2 and thiosulfate scrubber BVOCs test results

As seen on Figure S1, the monoterpenes were unaffected by the scrubber (with a relative deviation of less than ±10%) but for oxygenated compounds, a loss of signal remained even after nine hours: e.g. nopinone (12%), citral (23%), linalool (38%) and menthol (45%).

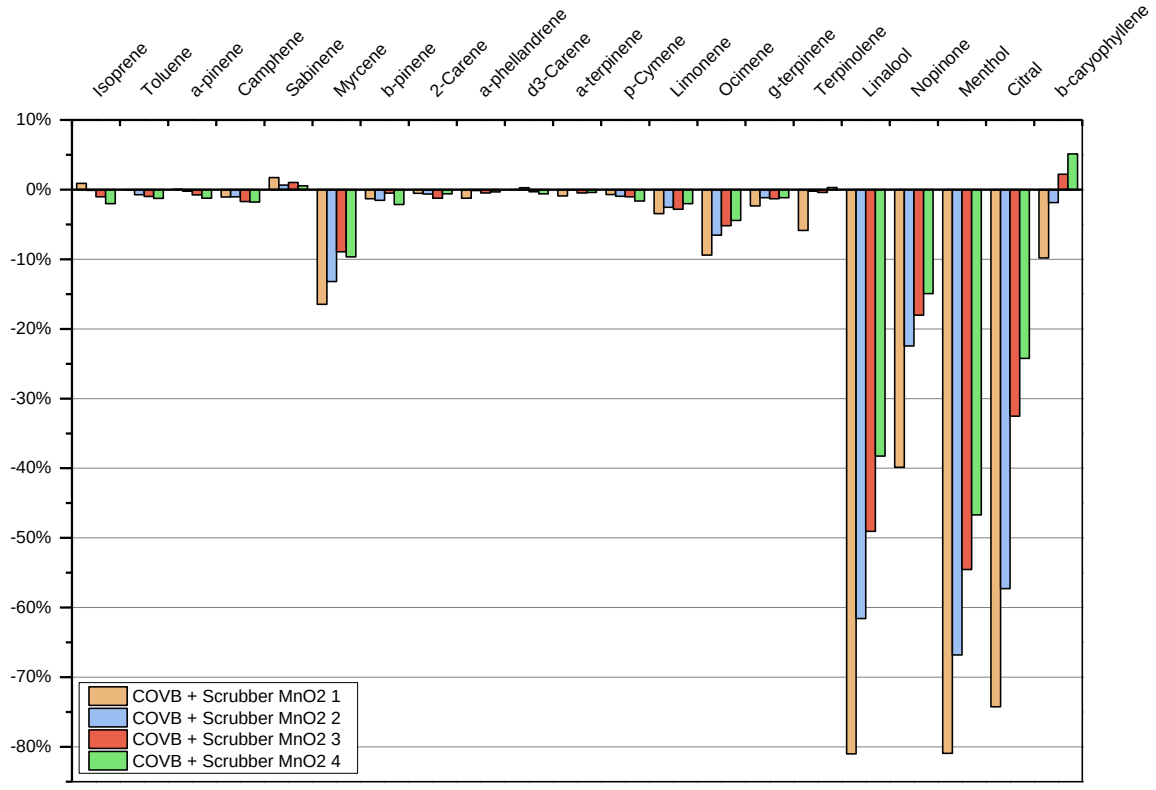

Figure S1 : Relative deviation to direct measurement of VOC concentrations when sampling with a MnO_2 scrubber. Each bar represents one measurement.

S3 Uncertainties repartition in field campaign conditions

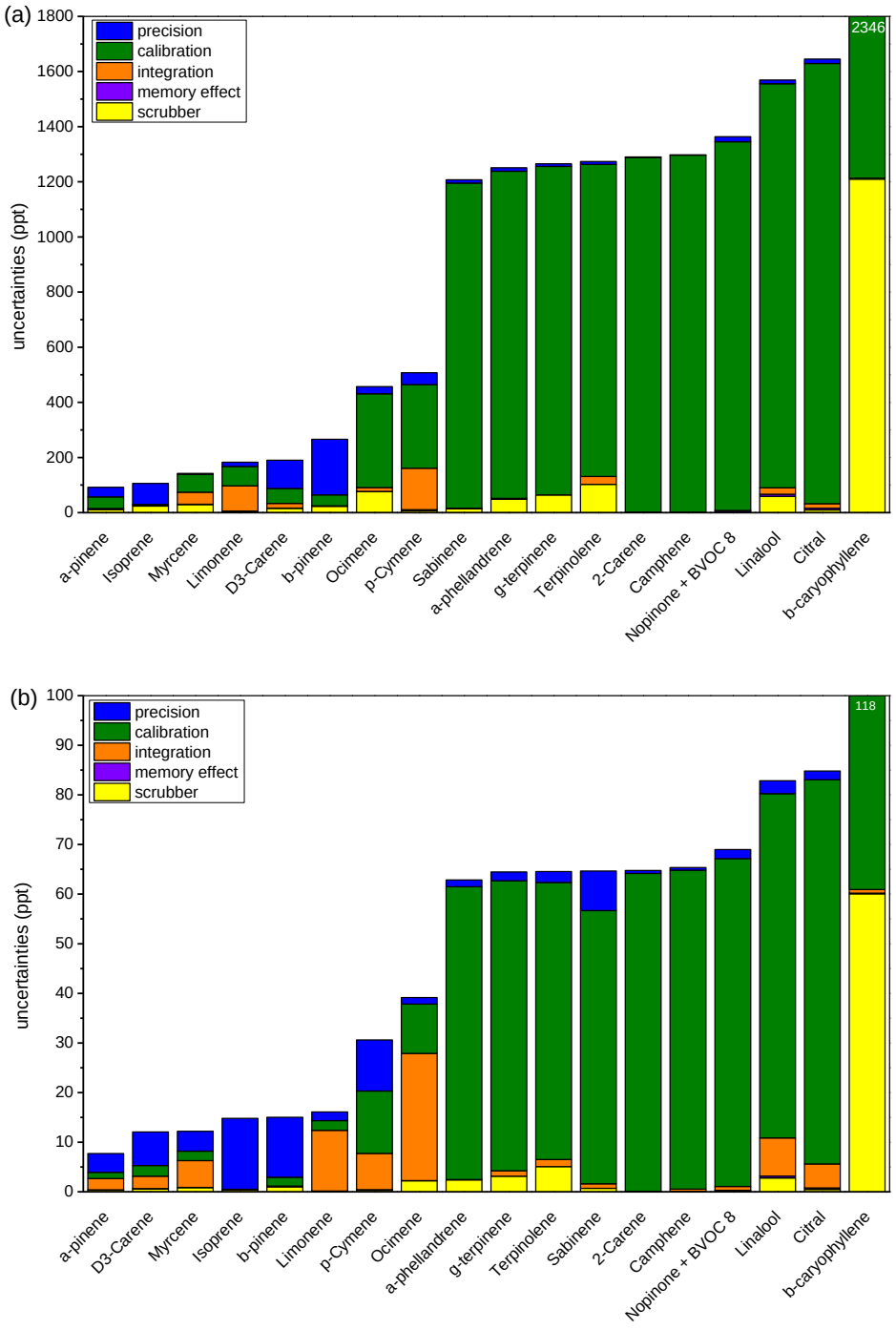

Figure S2 : Uncertainty repartition for the five terms considered (precision, calibration, integration, memory effect and scrubber) at (a) 2 ppb and (b) 100 ppt with field campaign analytical parameters.

S4 Concentrations time series for the 20 BVOCs measured during the LANDEX-episode 1 field campaign in summer 2017

BVOC time series of β-pinene, α-pinene, limonene, myrcene, Δ^3-carene, linalool, isoprene and β-caryophyllene are presented on the main publication. The other compounds are presented on Figure S2.

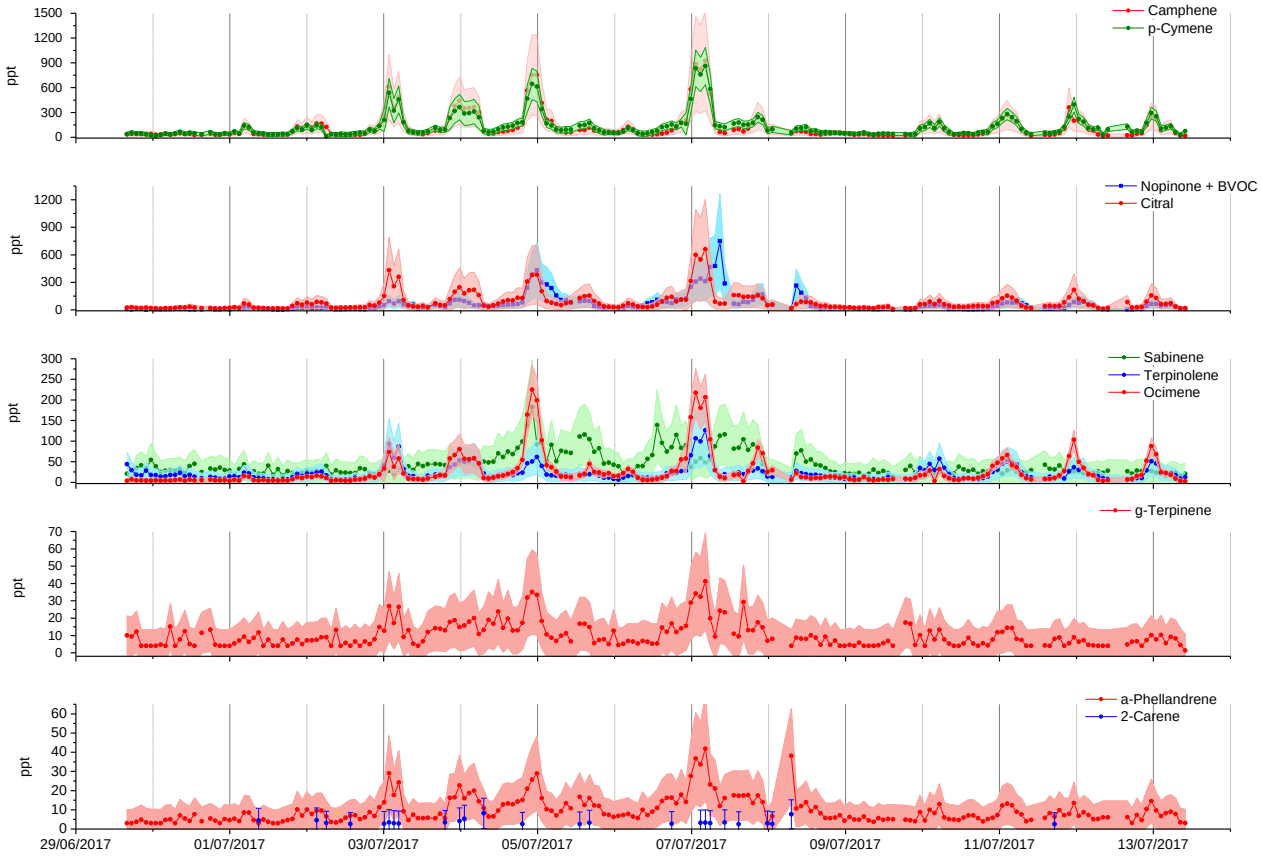

Figure S3 : Times series of BVOC concentrations with their associated uncertainties (k=2) for a selection of compounds observed during the LANDEX field campaign (camphene, p-cymene, nopinone, citral, sabinene, terpinolene, ocimene, γ-terpinene, α-terpinene, α-phellandrene, 2-carene).