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*Supplement of*

## **A sampler for atmospheric volatile organic compounds by copter unmanned aerial vehicles**

**Karena A. McKinney et al.**

*Correspondence to:* Karena A. McKinney ([kamckinn@colby.edu](mailto:kamckinn@colby.edu)) and Scot T. Martin ([scot\\_martin@harvard.edu](mailto:scot_martin@harvard.edu))

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**Description of the calibration standard.**

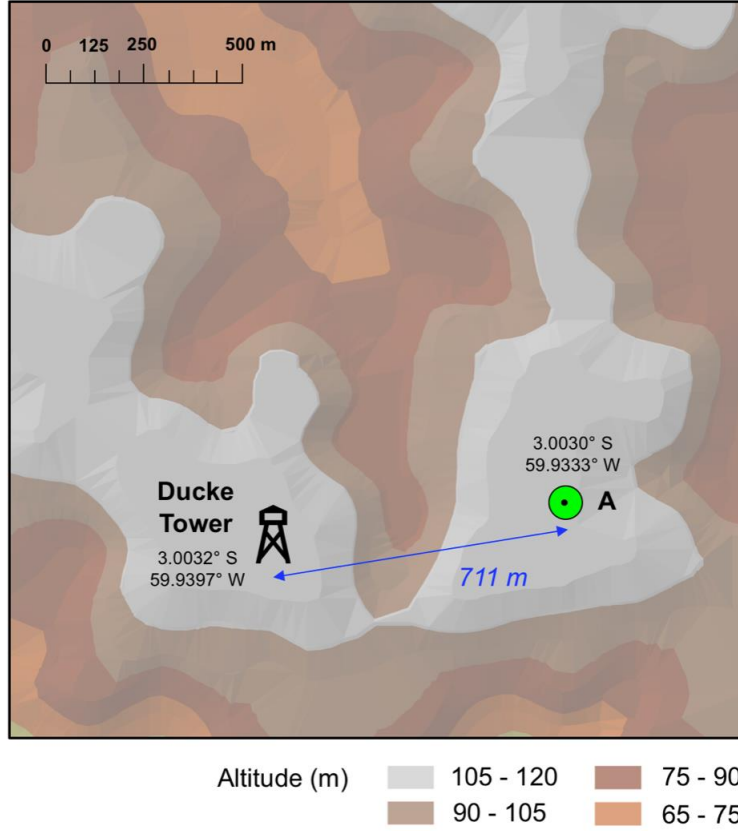
The thermal desorption cartridge samples were calibrated using a commercial standard from Apel-Riemer Environmental Inc. on a daily basis. The standard contained isoprene,  $\alpha$ -pinene,  $\beta$ -pinene, limonene, myrcene, aromadendrene, methyl vinyl ketone, terpinolene, methacrolein, farnesol, cis-3-hexenyl-acetate, caryophyllene, 3-carene, longifolene, acetaldehyde, methanol, acetone, benzene, toluene, o-xylene, 1,3,5-trimethylbenzene, 1,2,4-trichlorobenzene, 1,3,5-triisopropylbenzene, C<sub>3</sub>-C<sub>10</sub> alkanes, and C<sub>3</sub>-C<sub>6</sub> alkenes.

**Table S1.** Sampler Components.

<b>Item</b>	<b>Manufacturer</b>	<b>Part number</b>	<b>Specification</b>
Pressure sensor	NXP	MPX4100AP-ND	20 to 105 kPa $\pm$ 1.8% FS
Valve manifold	NResearch Inc.	161T102	5 sample channels
Valve driver board	NResearch Inc.	161D5X24	
Flow sensor	Omron	D6F-P	0 to 1 SLPM $\pm$ 5% FS
Micro Diaphragm pump	Parker Hargraves	E155-11-050	0.1 to 0.6 L min <sup>-1</sup>
Needle Valve	Universal Power Conv.	F-2822-51-B85-K-V	
Microcontroller	Arduino	Uno	
Power	DJI Matrice 600	TB48S	18 VDC, 130 Wh, 2.5 Wh used

**Table S2.** Measured VOC masses in Sample and Blank Adsorbent Cartridges.<sup>a</sup> “n.d.” denotes that the VOC mass was below the detection limit of the instrument. <sup>b</sup>Sampling time for the blanks is the duration for the blanks that were uncapped. <sup>c</sup>Sampling volume was calculated under standard conditions (273 K and 1 atm).

Sample	Local time	Location (Distance to Tower, m)	Altitude (m)	Sample type	Isoprene (pg)	$\alpha$ -Pinene (pg)	$\beta$ -Pinene (pg)	d-Limonene (pg)	Athujene (pg)	Tricyclene (pg)	Camphene (pg)	Carene (pg)	Sampling time <sup>b</sup> (min)	Sampling volume <sup>c</sup> (L)
1	11:15 - 11:35	711 m	75	Sample	6405.1	464.1	101.6	53.1	12.0	22.2	11.7	1.5	10.0	1.54
				Blank	327.7	27.1	5.2	10.7	1.2	n.d.	2.7	0.4	20.3	
2	11:15 - 11:35	Tower top	42	Sample	11601.2	1081.4	208.2	n.d. <sup>a</sup>	8.7	57.7	0.9	3.5	20.0	1.76
				Blank	736.8	121.6	24.5	n.d.	3.3	1.9	5.6	13.8	20.0	
3	13:15 - 13:35	711 m	100	Sample	12225.6	528.4	119.6	96.0	9.1	22.8	9.6	6.6	10.0	1.46
				Blank	392.4	57.2	11.0	n.d.	1.7	0.2	6.0	4.1	28.8	
4	15:15 - 15:35	711 m	60	Sample	8275.2	492.2	112.4	n.d.	17.3	25.7	37.1	5.6	10.0	1.51
				Blank	381.7	18.1	4.1	n.d.	n.d.	n.d.	2.9	0.3	25.9	
5	15:15 - 15:35	Tower top	42	Sample	14507.6	675.7	127.5	8.3	5.2	42.7	7.2	6.1	20.0	1.76



**Figure S1.** Topographical map of the experimental site. Labels indicate the location of the tower and point A, where samples were taken with the UAV.