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VOC emission rates over London and South East England obtained by airborne eddy covariance

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Electronic Supplementary Information

RF (South Sussex)	Date & Time of Day	Temperature mean/ °C	Humidity mean/ %	Wind speed mean/ m s^{-1}	Wind Direction mean/ °
8 (2013)	07/07/2013 (PM)	25.40 +/- 0.70	53.35 +/- 6.11	4.95 +/- 1.62	76.02 +/- 54.87
9 (2013)	08/07/2013 (AM)	21.22 +/- 0.25	50.76 +/- 9.75	7.99 +/- 1.37	48.49 +/- 12.92
10 (2013)	08/07/2013 (PM)	24.20 +/- 0.47	47.37 +/- 5.63	7.28 +/- 1.70	58.13 +/- 42.01
3 (2014)	12/07/2014 (PM)	18.71 +/- 6.13	68.81 +/- 8.88	4.58 +/- 2.50	224.77 +/- 60.09
4 (2014)	14/07/2014 (PM)	14.78 +/- 3.79	66.59 +/- 11.22	7.95 +/- 1.92	250.74 +/- 26.55
5 (2014)	15/07/2014 (AM)	14.95 +/- 4.29	53.85 +/- 21.93	5.73 +/- 3.20	279.02 +/- 24.81
7 (2014)	16/07/2014 (PM)	18.57 +/- 3.73	63.73 +/- 11.97	4.95 +/- 0.96	249.95 +/- 23.77

RF (Greater London)	Date & Time of Day	Temperature mean/ °C	Humidity mean/ %	Wind speed mean/ m s^{-1}	Wind Direction mean/ °
5 (2013)	03/07/2013 (AM)	15.41 +/- 0.71	84.89 +/- 20.34	6.31 +/- 1.29	281.09 +/- 11.22
7 (2013)	04/07/2013 (PM)	20.00 +/- 0.54	74.92 +/- 9.79	7.53 +/- 1.41	241.29 +/- 11.37
8 (2013)	07/07/2013 (PM)	24.15 +/- 0.78	55.08 +/- 3.03	5.48 +/- 1.49	80.44 +/- 33.23
9 (2013)	08/07/2013 (AM)	21.70 +/- 0.54	49.78 +/- 13.23	7.23 +/- 1.30	57.79 +/- 13.42
10 (2013)	08/07/2013 (PM)	23.49 +/- 0.48	55.87 +/- 3.52	7.26 +/- 1.36	56.99 +/- 15.62
11 (2013)	09/07/2013 (AM)	15.92 +/- 1.77	41.78 +/- 25.83	6.87 +/- 4.75	50.83 +/- 42.85
12 (2013)	09/07/2013 (PM)	22.87 +/- 0.49	33.21 +/- 3.42	5.54 +/- 1.28	53.64 +/- 40.08
3 (2014)	12/07/2014 (PM)	17.88 +/- 8.52	59.76 +/- 6.64	2.54 +/- 1.52	197.60 +/- 83.61
4 (2014)	14/07/2014 (PM)	19.05 +/- 3.44	47.66 +/- 7.93	7.55 +/- 1.81	245.05 +/- 17.29
5 (2014)	15/07/2014 (AM)	17.09 +/- 3.66	57.39 +/- 14.56	5.06 +/- 2.79	283.48 +/- 30.97
6 (2014)	16/07/2014 (AM)	16.17 +/- 3.27	66.62 +/- 3.77	2.84 +/- 2.16	239.16 +/- 81.64
7 (2014)	16/07/2014 (PM)	21.81 +/- 0.83	47.84 +/- 3.75	4.21 +/- 1.49	233.78 +/- 27.69

Table S1. Upper, meteorological conditions during all biogenic RF's (July 2013 & 2014). Lower, meteorological conditions during anthropogenic RF's over greater London (July 2013 & 2014).

	Flux mean/ mg m^{-2} hr^{-1}	Flux median/ mg m^{-2} hr^{-1}	Standard Deviation	Standard Error	95th Percentile
Isoprene (2013)	0.74	0.72	0.45	0.02	1.60
Isoprene (2014)	0.48	0.47	0.32	0.03	0.96
Total Monoterpenes (2013)	0.16	0.11	0.21	0.01	0.54
Total Monoterpenes (2014)	0.12	0.10	0.19	0.01	0.45
MVK/MACR (2014)	0.056	0.054	0.050	0.002	0.130

Table S2. Measured biogenic fluxes statistics during both campaigns for isoprene, Total monoterpenes and MVK/MACR.

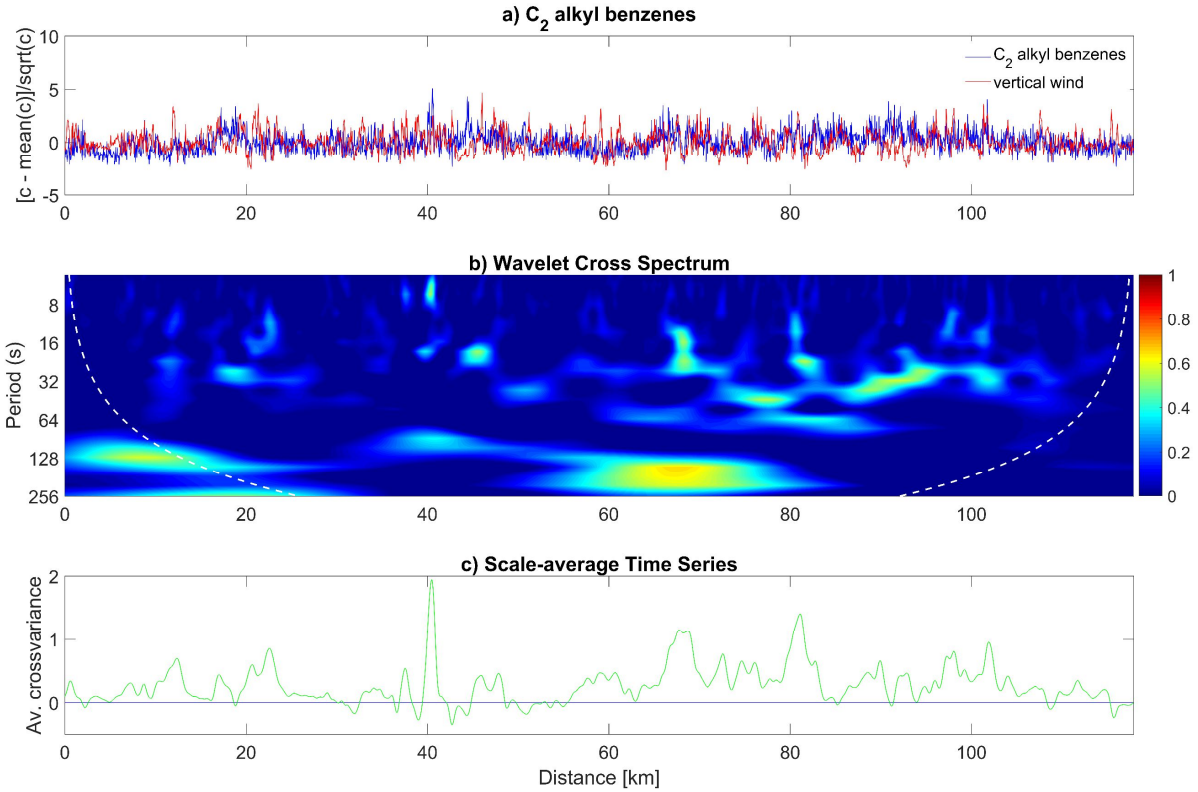

Fig. S1. a) instantaneous changes of vertical wind and concentration from their respective means. b) Global cross-spectrum of eddy contributions integrated over all frequency periods along flight track. c) average cross variance of C_2 alkyl-benzenes flux long flight track.

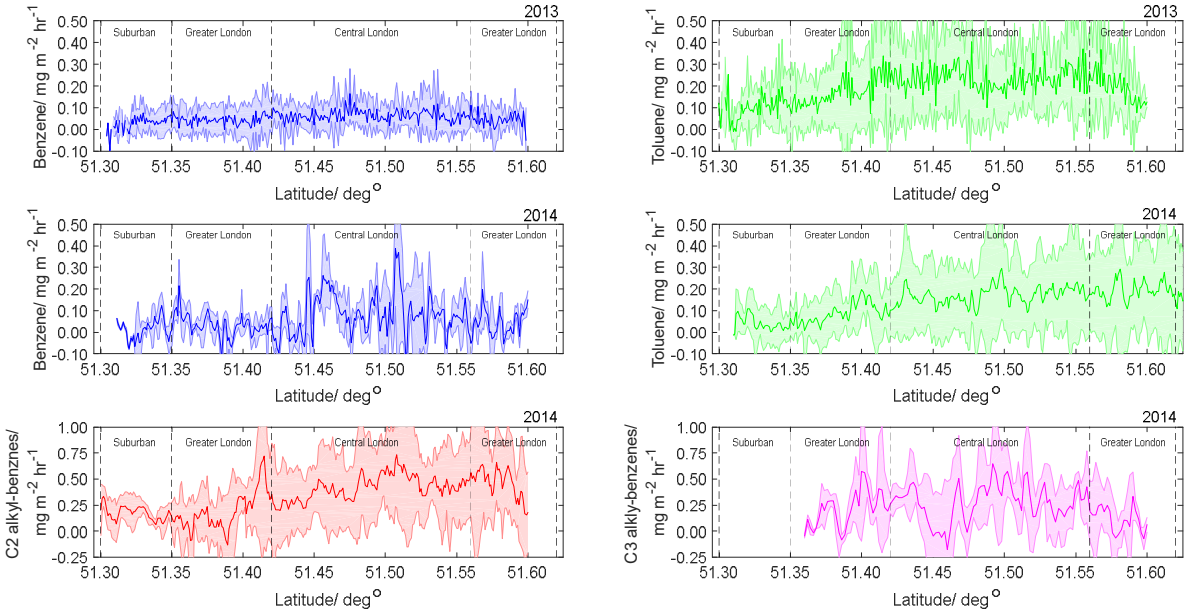

Fig. S2. Latitude average fluxes for benzene and toluene (2013), and averages fluxes for benzene, toluene, C_2 alkyl-benzenes and C_3 alkyl-benzenes (2014).

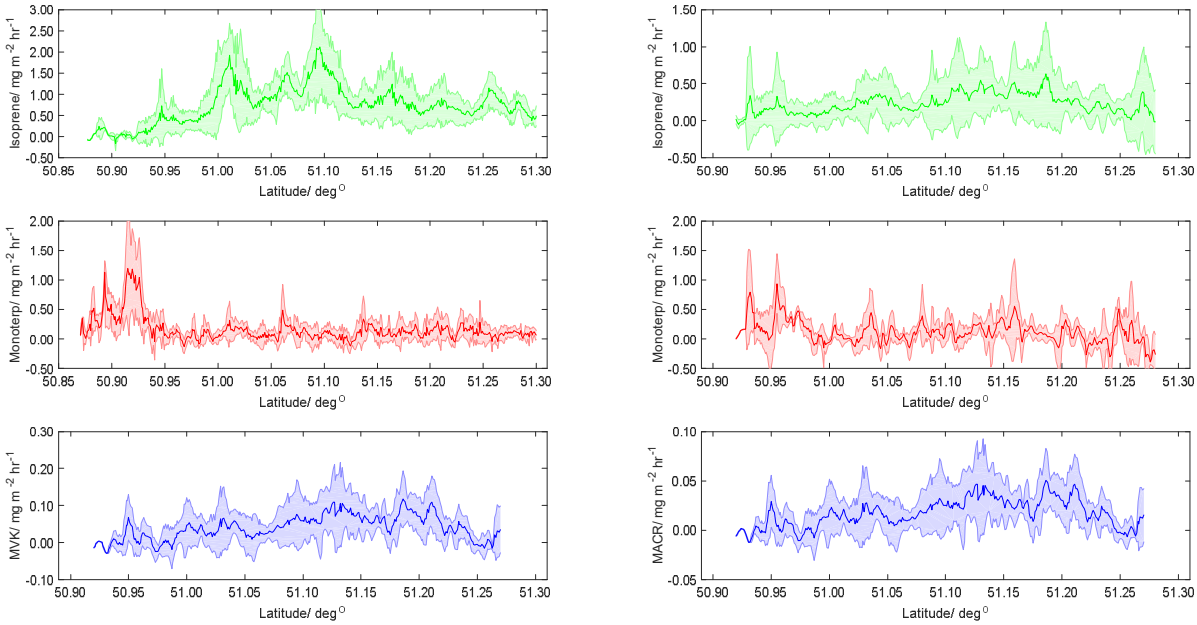

Fig. S3. Measured Biogenic nm-voc emissions over South Sussex. Top) latitude averaged isoprene fluxes from July 2013 & 2014. Middle) latitude averaged total monoterpene fluxes from July 2013 & 2014. Bottom) latitude average of MVK and MACR fluxes during July 2014.

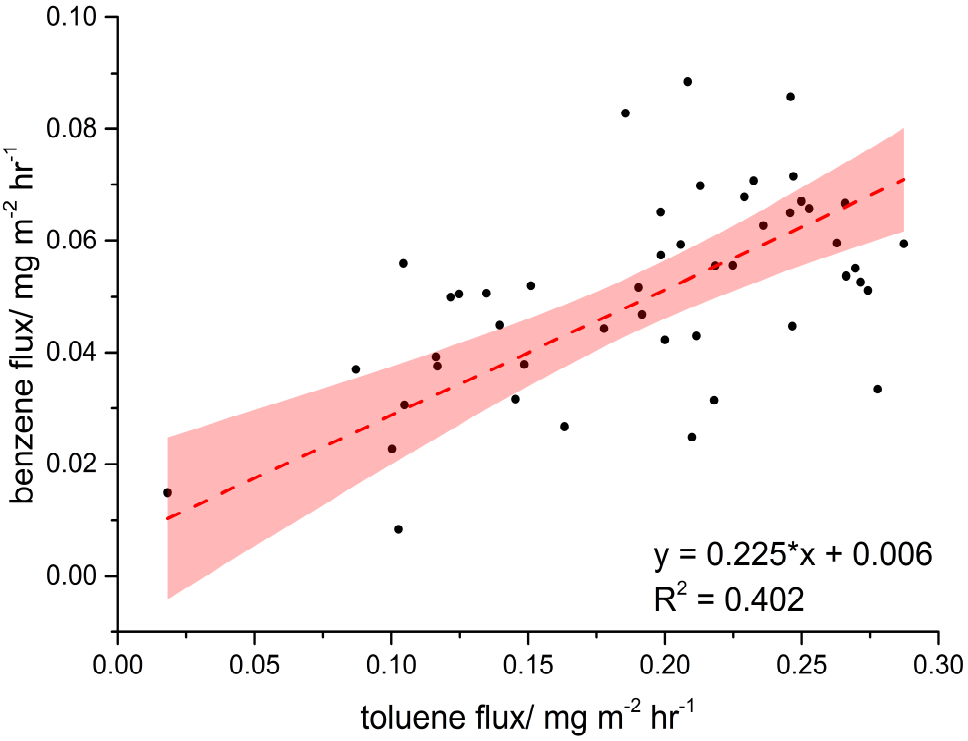

Fig. S4. Averaged (1 km intervals) toluene and benzene flux, with linear trend and 95 % confidence band (shaded). Ratio of benzene/toluene, 0.225.