



Supplement of

Field testing two flux footprint models

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Supplementary Table. Final data set used for footprint analyses following application of quality control criteria. Data sorted by fetch distance.

Local Date - Time (YY-mm-dd hh:mm)	Meteorological Measurements					Synthetic Source Information Corners of synthetic source (→=east, ↑=north): EC tower located at 0,0								EC Measured Flux			Synthetic Flux estimated from LS footprint				Synthetic Flux estimated from KM footprint								
	Windspeed at EC height of z=1.96 m (m/s)	Friction velocity u^* (m/s)	Obukhov stability length L (m)	Standard deviation of crosswind σ_y	Wind Direction (deg)	Implied roughness length z_0 (m)	x1 (m)	y1 (m)	x2 (m)	y2 (m)	x3 (m)	y3 (m)	x4 (m)	y4 (m)	Synthetic Source Area (m2)	Distance from EC tower to Source Center (m)	Distance category (fetch)	Deviation of Wind Direction from EC- to Source line (deg)	Tracer Release Rate Q_i ($g\ CO_2\ hr^{-1}$)	EC CO_2 flux during gas release ($\mu mol\ m^{-2}\ s^{-1}$)	EC CO_2 flux background corrected ($\mu mol\ m^{-2}\ s^{-1}$)	EC CO_2 flux-background corrected ($\mu mol\ m^{-2}\ s^{-1}$)	LS footprint value: EC flux / Q_{EC} (fraction)	Estimated Synthetic Source Emission Rate Q_{SE} ($g\ CO_2\ hr^{-1}$)	Q_{SE} standard deviation ($g\ CO_2\ hr^{-1}$)	Q_{SE}/Q_{EC} - Ratio of Q_{SE} to true emission rate	Phi tot (Integral of footprint function over considered domain %)	Footprint contribution of release area	Q_{KM}/Q_{EC} Ratio of Q_{KM} to true emission rate
26/10/2018 12:40	2.60	0.265	-46.7	0.643	143.3	0.0337	-0.22	-6.70	7.29	-0.06	11.97	-9.02	3.12	-13.84	88.86	9.25	15	0.1	6562	47.55	0.33	47.22	0.1083	6140	605	0.94	0.853	0.100	1.18
26/10/2018 12:50	2.57	0.255	-103.0	0.664	151.7	0.0323	-0.22	-6.70	7.29	-0.06	11.97	-9.02	3.12	-13.84	88.86	9.25	15	8.5	6562	28.81	0.33	28.48	0.1348	2974	108	0.45	0.835	0.086	0.85
26/10/2018 13:00	2.75	0.214	-11.9	0.652	142.3	0.0077	-0.22	-6.70	7.29	-0.06	11.97	-9.02	3.12	-13.84	88.86	9.25	15	0.9	6562	32.37	0.33	32.03	0.0631	7146	695	1.09	0.882	0.043	1.82
26/10/2018 13:10	2.31	0.233	-88.7	0.546	140.4	0.0340	-0.22	-6.70	7.29	-0.06	11.97	-9.02	3.12	-13.84	88.86	9.25	15	2.8	6562	48.49	0.33	48.15	0.1078	6287	415	0.96	0.838	0.099	1.24
26/10/2018 13:20	1.65	0.226	-244.9	0.520	154.7	0.1035	-0.22	-6.70	7.29	-0.06	11.97	-9.02	3.12	-13.84	88.86	9.25	15	11.5	6562	23.53	0.33	23.20	0.1390	2350	152	0.36	0.831	0.184	0.33
29/10/2018 17:20	2.49	0.211	68.0	0.521	324.9	0.0204	-4.17	10.66	-9.78	2.25	-17.46	7.36	-11.63	15.65	92.16	14.02	15	15.1	9842	68.21	0.67	67.54	0.1114	8850	479	0.90	0.783	0.082	1.56
29/10/2018 17:30	3.02	0.230	37.4	0.679	316.5	0.0133	-4.17	10.66	-9.78	2.25	-17.46	7.36	-11.63	15.65	92.16	14.02	15	6.7	9842	72.56	0.67	71.89	0.1149	9134	602	0.93	0.765	0.077	1.82
29/10/2018 17:40	2.70	0.200	21.0	0.510	316.8	0.0144	-4.17	10.66	-9.78	2.25	-17.46	7.36	-11.63	15.65	92.16	14.02	15	7.0	9842	58.91	0.67	58.24	0.1137	7479	708	0.76	0.747	0.078	1.48
29/10/2018 17:50	2.36	0.186	19.3	0.425	315.3	0.0204	-4.17	10.66	-9.78	2.25	-17.46	7.36	-11.63	15.65	92.16	14.02	15	5.5	9842	46.85	0.67	46.18	0.1001	6735	478	0.68	0.747	0.094	0.98
29/10/2018 18:00	1.68	0.109	7.3	0.224	311.9	0.0155	-4.17	10.66	-9.78	2.25	-17.46	7.36	-11.63	15.65	92.16	14.02	15	2.1	9842	23.73	0.67	23.06	0.0818	4118	465	0.42	0.716	0.048	0.99
31/10/2018 14:20	1.29	0.164	-5.7	0.335	292.7	0.0448	-4.17	10.66	-9.78	2.25	-17.46	7.36	-11.63	15.65	92.16	14.02	15	17.1	9842	117.52	-0.22	117.74	0.0393	43713	5181	4.44	0.899	0.194	1.00
31/10/2018 15:00	1.61	0.107	-9.8	0.302	295.9	0.0030	-4.17	10.66	-9.78	2.25	-17.46	7.36	-11.63	15.65	92.16	14.02	15	13.9	9842	59.55	-0.22	59.77	0.0688	12679	1459	1.29	0.885	0.048	2.08
31/10/2018 15:20	0.85	0.121	-15.7	0.335	284.8	0.0857	-4.17	10.66	-9.78	2.25	-17.46	7.36	-11.63	15.65	92.16	14.02	15	25.0	9842	79.15	-0.22	79.37	0.0452	25659	2923	2.61	0.884	0.130	1.03
22/10/2018 16:20	3.70	0.345	-84.1	0.920	149.9	0.0246	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	11.1	3281	20.03	0.70	19.33	0.1256	2507	214	0.76	0.838	0.104	1.10
22/10/2018 16:30	3.57	0.387	-107.2	0.767	147.4	0.0454	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	8.6	3281	26.54	0.70	25.84	0.1202	3500	226	1.07	0.836	0.164	0.94
22/10/2018 16:40	3.33	0.298	-78.8	0.767	149.3	0.0204	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	10.5	3281	22.06	0.70	21.36	0.1298	2680	242	0.82	0.838	0.103	1.22
22/10/2018 16:50	3.95	0.375	-208.8	0.790	138.1	0.0280	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	0.7	3281	34.49	0.70	33.79	0.1505	3656	209	1.11	0.823	0.148	1.38
22/10/2018 17:00	2.67	0.261	-84.3	0.739	153.0	0.0303	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	14.2	3281	18.07	0.70	17.36	0.1159	2440	365	0.74	0.839	0.106	0.97
22/10/2018 17:10	2.76	0.292	-193.1	0.832	151.9	0.0431	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	13.1	3281	18.37	0.70	17.66	0.1201	2396	123	0.73	0.827	0.118	0.90
22/10/2018 17:20	3.39	0.408	1225.4	0.857	151.8	0.0712	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	13.0	3281	20.58	0.70	19.88	0.1299	2493	154	0.76	0.816	0.157	0.77
22/10/2018 17:30	2.77	0.254	123.0	0.603	148.5	0.0272	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	9.7	3281	24.23	0.70	23.52	0.1565	2448	115	0.75	0.794	0.120	1.23
22/10/2018 17:40	2.59	0.153	45.5	0.500	147.7	0.0199	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	8.9	3281	22.15	0.70	21.45	0.1685	2074	147	0.63	0.773	0.111	1.24
22/10/2018 17:50	2.79	0.254	53.7	0.719	149.6	0.0293	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	10.8	3281	23.32	0.70	22.62	0.1541	2391	133	0.73	0.780	0.107	1.34
22/10/2018 18:00	2.84	0.185	19.4	0.627	147.2	0.0069	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	8.4	3281	16.38	0.70	15.68	0.1374	1858	167	0.57	0.740	0.053	2.00
22/10/2018 18:10	2.01	0.223	21.8	0.510	148.3	0.0846	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	9.5	3281	26.20	0.70	25.49	0.1504	2760	146	0.84	0.766	0.143	1.16
22/10/2018 18:20	1.45	0.094	13.4	0.357	136.5	0.0085	3.18	-9.51	11.69	-3.87	16.53	-13.28	7.95	-18.21	102.79	14.92	15	2.3	3281	12.03	0.70	11.33	0.1065	1733	95	0.53	0.728	0.051	1.52
29/10/2018 15:10	4.49	0.502	-128.6	1.416	306.5	0.0519	-27.03	14.71	-27.99	4.82	-38.01	8.26	-35.71	17.92	96.76	34.16	30	16.9	9842	37.55	0.38	37.17	0.0221	25751	2929	2.62	0.835	0.031	2.20
29/10/2018 15:20	3.87	0.494	-101.2	1.209	307.1	0.0793	-27.03	14.71	-27.99	4.82	-38.01	8.26	-35.71	17.92	96.76	34.16	30	17.5	9842	26.73	0.38	26.35	0.0185	21780	5091	2.21	0.842	0.030	1.65
29/10/2018 15:30	4.42	0.413	-89.4	1.045	292.2	0.0250	-27.03	14.71	-27.99	4.82	-38.01	8.26	-35.71	17.92	96.76	34.16	30	2.6	9842	38.69	0.38	38.31	0.0436	13465	1175	1.37	0.836	0.055	1.30
29/10/2018 15:40	4.45	0.454	-79.7	1.333	312.9	0.0355	-27.03	14.71	-27.99	4.82	-38.01	8.26	-35.71	17.92	96.76	34.16	30	23.3	9842	15.31	0.38	14.92	0.0165	13864	1042	1.41	0.841	0.024	1.13
29/10/2018 15:50	4.41	0.423	-82.6	1.142	312.6	0.0279	-27.03	14.71	-27.99	4.82	-38.01	8.26	-35.71	17.92	96.76	34.16	30	23.0	9842	20.94	0.38	20.56	0.0149	21084	7672	2.14	0.839	0.022	1.71
29/10/2018 16:00	4.75	0.425	-106.8	1.114	309.8	0.0210	-27.03	14.71	-27.99	4.82	-38.01	8.26	-35.71	17.92	96.76	34.16	30	20.2	9842	20.71	0.38	20.33	0.0197	15818	2984	1.61	0.832	0.026	1.46
26/10/2018 15:00	1.83	0.180	-5.5	0.698	137.6	0.0175	6.31	-28.38	16.32	-26.48	18.25	-35.54	8.60	-37.93	96.01	34.38	30	21.3	6562	6.53	0.33	6.20	0.0136	6945	1410	1.06	0.897	0.029	0.56
26/10/2018 15:10	2.31	0.260	-15.9	0.791	138.3	0.0406	6.31	-28.38	16.32	-26.48	18.25	-35.54	8.60	-37.93	96.01	34.38	30	20.6	6562	10.83	0.28	10.55	0.0114	14116	3286	2.15	0.881	0.028	0.98
26/10/2018 15:30	1.76	0.242	-17.4	0.713	156.2	0.0778	6.31	-28.38	16.32	-26.48	18.25	-35.54	8.60	-37.93	96.01	34.38	30	2.7	6562	9.77	0.28	9.48	0.0123	11690	3238	1.78	0.882	0.032	0.77
29/10/2018 12:40	2.64	0.296	-25.1	0.788	283.6	0.0438	-46.96	11.45	-57.01	13.14	-54.97	22.96	-46.11	21.40	95.80	54.09	50	5.0	6562	4.84	-0.01	4.84	0.0062	11769	5799	1.79	0.870	0.016	0.81
29/10/2018 13:00	3.52	0.410	-52.9	0.872	280.3	0.0559	-46.96	11.45	-57.01	13.14	-54.97	22.96	-46.11	21.40	95.80	54.09	50	8.3	6562	0.70	-0.01	0.71	0.0094	1143	461	0.17	0.853	0.017	0.11
29/10/2018 13:10	2.97	0.393	-42.8	1.018	301.7	0.0821	-46.96	11.45	-57.01	13.14	-54.97	22.96	-46.11	21.40	95.80	54.09	50	13.1	6562	5.02	-0.01	5.03	0.0048	16000	4601	2.44	0.860	0.010	1.29
29/10/2018 13:20	3.52	0.381	-42.3	0.880	285.6	0.0417	-46.96	11.45	-57.01	13																			