Supplemental Materials for

Evaluation of profiles of standard deviation vertical wind in the urban area of Rome: performances of Monin–Obukhov similarity theory using different scaling variables.

A. Pelliccioni[1,*], L. Grandoni [2], A. Di Bernardino[3]

[1] Italian Workers' Compensation Authority (INAIL), Department of Occupational and Environmental Medicine, Epidemiology and Hygiene, Monte Porzio Catone, 00078 Rome, Italy; a.pelliccioni@inail.it (A.P.)

[2] Department of Civil, Constructional and Environmental Engineering, Sapienza University, 00185 Rome, Italy; livia.grandoni@uniroma1.it (L.G.)

[3] Physics Department, Sapienza University, 00185 Rome, Italy; annalisa.dibernardino@uniroma1.it (A.D.B.)

*Correspondence: a.pelliccioni@inail.it

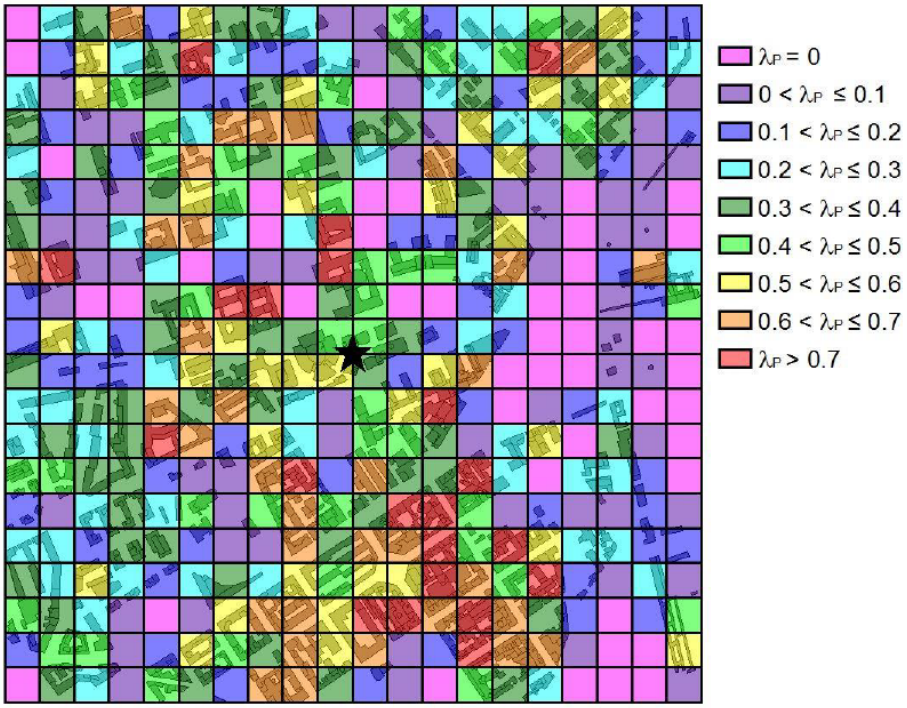

Figure S1. Planar area fraction, 50 m x 50 m grid

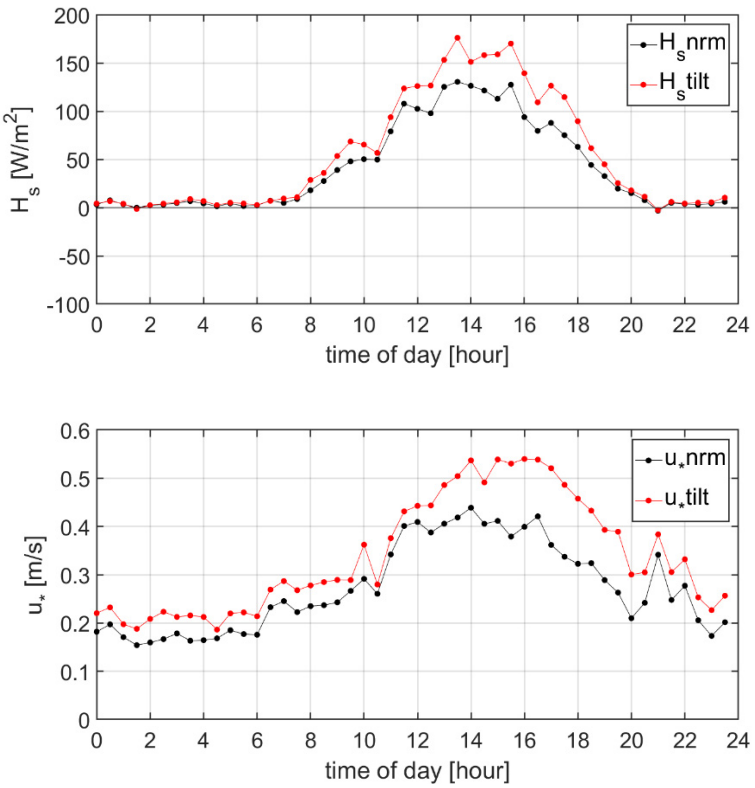

Figure S2. Daily trend of turbulent sensible heat fluxes and friction velocity. Each point is the monthly average of heat fluxes or friction velocity at the time of day. April 9th has been excluded as an extreme event occurred.

Table S1. Hourly averaged values of friction velocity and sensible heat flux along with the percentage difference between the quantities in the tilted and normal coordinate systems.

hour of the day	u* nrm	u* tilt	(u*tilt-u*nrm)/u*nrm [%]	Hs nrm	Hs tilt	(Hs tilt-Hs nrm)/Hs nrm [%]
0	0.19	0.23	19	5.38	5.51	2
1	0.17	0.20	18	1.93	1.78	-8
2	0.16	0.22	32	2.82	3.33	18
3	0.17	0.22	26	5.57	6.97	25
4	0.21	0.25	15	-1.99	-1.06	-46
5	0.22	0.25	17	2.81	4.28	52
6	0.25	0.28	13	5.84	5.95	2
7	0.29	0.34	15	4.82	7.69	60
8	0.28	0.33	16	23.76	32.80	38
9	0.36	0.43	19	-12.83	19.52	-252
10	0.36	0.44	23	-38.31	19.13	-150
11	0.44	0.52	18	34.90	67.39	93
12	0.43	0.51	17	45.30	83.06	83
13	0.43	0.53	23	94.48	144.94	53
14	0.42	0.53	24	97.33	138.13	42
15	0.40	0.54	35	91.37	140.20	53
16	0.41	0.55	32	64.78	108.88	68
17	0.37	0.52	42	57.53	100.60	75
18	0.33	0.45	36	52.58	73.63	40
19	0.28	0.39	40	24.80	33.07	33
20	0.24	0.31	32	10.09	13.12	30
21	0.30	0.35	17	0.82	1.47	80
22	0.25	0.30	21	2.96	4.11	39
23	0.19	0.24	29	5.11	7.96	56

Table S2. Parameters of the logarithmic fit of the wind velocity vertical profile per each atmospheric stability class. The logarithmic function used is the following: $u = \alpha\, ln\left(\frac{z}{H}\right) + \beta$ (where z is the height a.g.l., H is the building height and u is the wind velocity).

Atmospheric stability class	R^2	α	β
A	0.994	1.315	2.313
B	0.956	1.343	2.704
C	0.979	2.780	2.995
D	0.974	2.817	3.091
E	0.967	3.014	2.120
F	0.986	3.090	1.719
G	0.977	2.473	1.522
H	0.851	2.772	0.343