Supplementary Materials

Field Estimation of the Power Temperature Coefficient of a Liquid-Cooled Photovoltaic–Thermal Collector: Sensitivity to Irradiance Normalisation and Model Specification

Time is local time. Q is calculated from the nominal flow rate (4.2 L/min) and carries an uncertainty of about ±110 W from the fluid-temperature sensors alone. r is the ratio of the measured power to the nameplate expectation (Equation (7) of the article).

Table S1. Observations of 26 March 2024.

Time	G (W/m²)	T_a (°C)	T_{panel} (°C)	T_{f1} (°C)	T_{f2} (°C)	$T_{f2}-T_{f1}$ (K)	Q (W)	P (W)	P_{norm} (W)	$Q/(GA)$	$P/(GA)$	r
09:00	314	10.3	13.50	12.0	12.5	0.5	129.9	91	289.81	0.255	0.179	1.15
09:30	360	11.0	19.40	12.5	13.1	0.6	155.8	112	311.11	0.267	0.192	1.26
10:00	480	12.1	23.60	24.3	25.3	1.0	259.7	145	302.08	0.334	0.186	1.25
10:30	525	12.5	29.00	25.4	26.5	1.1	285.7	156	297.14	0.336	0.183	1.26
11:00	680	13.9	35.00	27.4	28.7	1.3	337.7	185	272.06	0.307	0.168	1.19
11:30	710	14.2	36.40	28.3	29.7	1.4	363.6	191	269.01	0.316	0.166	1.18
12:00	750	14.5	37.30	30.0	31.0	1.0	259.7	202	269.33	0.214	0.166	1.19
12:30	745	14.7	37.90	31.8	32.9	1.1	285.7	200	268.46	0.237	0.166	1.19
13:00	720	15.0	38.10	32.0	33.4	1.4	363.6	180	250.00	0.312	0.154	1.11
13:30	704	15.0	37.60	32.1	33.1	1.0	259.7	176	250.00	0.228	0.154	1.10

Table S2. Observations of 30 April 2024.

Time	G (W/m²)	T_a (°C)	T_{panel} (°C)	T_{f1} (°C)	T_{f2} (°C)	$T_{f2}-T_{f1}$ (K)	Q (W)	P (W)	P_{norm} (W)	$Q/(GA)$	$P/(GA)$	r
11:00	510	14.4	14.80	28.4	29.4	1.0	259.7	148	290.20	0.314	0.179	1.16
11:30	670	16.9	28.71	29.0	30.3	1.3	337.7	171	255.22	0.311	0.158	1.08
12:00	800	20.9	35.01	31.7	33.4	1.7	441.6	203	253.75	0.341	0.157	1.11
12:30	820	23.9	37.60	33.6	35.1	1.5	389.6	205	250.00	0.293	0.154	1.10
13:00	750	24.3	40.50	35.4	37.1	1.7	441.6	190	253.33	0.363	0.156	1.13
13:30	755	24.8	40.90	36.0	36.9	0.9	233.8	185	245.03	0.191	0.151	1.10
14:00	760	25.6	43.70	33.4	35.0	1.6	415.6	175	230.26	0.338	0.142	1.05
14:30	720	25.4	43.40	33.3	34.5	1.2	311.7	162	225.00	0.267	0.139	1.02
15:00	650	25.3	43.96	33.3	35.1	1.8	467.5	155	238.46	0.444	0.147	1.09
15:30	580	24.8	43.80	33.7	35.0	1.3	337.7	152	262.07	0.359	0.162	1.19

Table S3. Observations of 21 May 2024.

Time	G (W/m²)	T_a (°C)	T_{panel} (°C)	T_{f1} (°C)	T_{f2} (°C)	$T_{f2}-T_{f1}$ (K)	Q (W)	P (W)	P_{norm} (W)	$Q/(GA)$	$P/(GA)$	r
09:00	368	16.5	17.20	21.2	22.2	1.0	259.7	92	250.00	0.436	0.154	1.01
09:30	410	18.9	27.90	22.4	23.2	0.8	207.8	97	236.59	0.313	0.146	1.00
10:00	540	20.0	36.90	23.8	24.9	1.1	285.7	130	240.74	0.327	0.149	1.06
10:30	700	21.0	42.40	25.3	26.9	1.6	415.6	150	214.29	0.366	0.132	0.97

Time	G (W/m²)	T_a (°C)	T_{panel} (°C)	T_{f1} (°C)	T_{f2} (°C)	$T_{f2}-T_{f1}$ (K)	Q (W)	P (W)	P_{norm} (W)	$Q/(GA)$	$P/(GA)$	r
11:00	810	22.0	44.56	28.2	29.7	1.5	389.6	170	209.88	0.297	0.130	0.96
11:30	850	22.4	45.10	28.7	30.3	1.6	415.6	190	223.53	0.302	0.138	1.02
12:00	870	23.0	46.16	29.0	30.7	1.7	441.6	180	206.90	0.313	0.128	0.95
12:30	872	23.1	45.90	29.1	30.8	1.7	441.6	176	201.83	0.313	0.125	0.93
13:00	890	24.0	42.56	29.3	31.2	1.9	493.5	170	191.01	0.342	0.118	0.86
13:30	800	24.5	40.50	29.4	31.3	1.9	493.5	160	200.00	0.381	0.123	0.90

Table S4. Influence diagnostics for the pooled model of specification A0 (n = 30; four parameters). The last column gives the coefficient obtained when the observation is omitted; with all observations it is −0.640%/°C.

Campaign	Time	T_{panel} (°C)	Leverage	Cook's distance	Externally studentised residual	γ_{field} without the observation (%/°C)
26 March	09:00	13.50	0.230	0.207	−1.73	−0.697
26 March	09:30	19.40	0.156	0.072	1.26	−0.613
26 March	10:00	23.60	0.122	0.039	1.06	−0.626
26 March	10:30	29.00	0.101	0.057	1.45	−0.636
26 March	11:00	35.00	0.108	0.000	0.12	−0.641
26 March	11:30	36.40	0.114	0.000	0.06	−0.640
26 March	12:00	37.30	0.119	0.002	0.22	−0.643
26 March	12:30	37.90	0.122	0.002	0.24	−0.643
26 March	13:00	38.10	0.123	0.066	−1.39	−0.619
26 March	13:30	37.60	0.120	0.071	−1.47	−0.619
30 April	11:00	14.80	0.319	0.003	0.16	−0.632
30 April	11:30	28.71	0.132	0.028	−0.86	−0.653
30 April	12:00	35.01	0.102	0.000	−0.03	−0.640
30 April	12:30	37.60	0.100	0.000	0.02	−0.640
30 April	13:00	40.50	0.105	0.017	0.75	−0.645
30 April	13:30	40.90	0.106	0.000	0.08	−0.640
30 April	14:00	43.70	0.118	0.021	−0.79	−0.629
30 April	14:30	43.40	0.117	0.057	−1.33	−0.623
30 April	15:00	43.96	0.120	0.000	−0.03	−0.639
30 April	15:30	43.80	0.119	0.139	2.17	−0.668
21 May	09:00	17.20	0.306	0.022	−0.44	−0.661
21 May	09:30	27.90	0.153	0.000	0.03	−0.639
21 May	10:00	36.90	0.102	0.086	1.81	−0.635
21 May	10:30	42.40	0.105	0.002	0.24	−0.642
21 May	11:00	44.56	0.114	0.001	0.18	−0.642
21 May	11:30	45.10	0.117	0.071	1.50	−0.659
21 May	12:00	46.16	0.123	0.001	0.15	−0.642
21 May	12:30	45.90	0.121	0.004	−0.32	−0.635
21 May	13:00	42.56	0.106	0.094	−1.86	−0.625
21 May	13:30	40.50	0.101	0.047	−1.31	−0.634