Supplementary Materials for

Flame-front rate of spread estimates for moderate scale experimental fires are strongly influenced by measurement approach

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This file includes:

Table S1-S3; Figure S1, S2

Table S1. Rate of spread (RoS) sampling methods for each burn conducted during the moderate-scale experimental campaigns.

Date	Burn	Visible Nadir	Visible Side	TC Linear Array	TC Grid Array	Infrared Grid Array	Infrared Triangular Method	Paugam et al. (2013)	Paugam et al. (2013) 773 K
June 7, 2013	2	3	3	3		3	3	3	3
June 9, 2013	1	3	3	3		3	3	3	3
June 12, 2013	1	3	3	3		3	3	3	3
	2	3	3	3		3	3	3	3
	3	3	3	3		3	3	3	3
June 14, 2013	1	3	3	3		3	3	3	3
June 16, 2013	1	3	3	3		3	3	3	3
	2	3	3	3		3	3	3	3
	3	3	3	3		3	3	3	3
June 17, 2013	1	3	3	3		3	3	3	3
	2	3	3	3					
	3	3	3	2		3	3	3	3
June 18, 2013	1	3	3	3		2	2	2	2
	2	3	3	3		3	3	3	3
	3	3	3	3		3	3	3	3
	4	3	3	3		3	3	3	3
	5	3	3	3		3	3	3	3
	6	3	3	3		3	3	3	3
	7	3	3	3		3	3	3	3
	8	3	3	3		3	3	3	3
August 26, 2014	1	3	3	3	3	3	3	3	3
	2	3	3	3	3				
	3	3	3	3	3	3	3	3	3
August 27, 2014	1	3	3	3	3	2	2	2	2
	2	3	3	2	3				
	3	3	3	2	3	3	3	3	3
	4	3	3	1	3	3	3	3	3

Note: Where TC refers to "thermocouple". Not all methods were possible for each burn due to equipment constraints (i.e,. during the 2013 campaign it was not possible to deploy thermocouples in the grid format), as well as periodic equipment malfunctions (i.e., IR camera focus errors or saturation, data logging failures, and degradation of thermocouples). For each burn, where RoS measures were conducted for a given method, the number of rows of the burn platform (1 - 3) that produced usable data is entered in the table here.

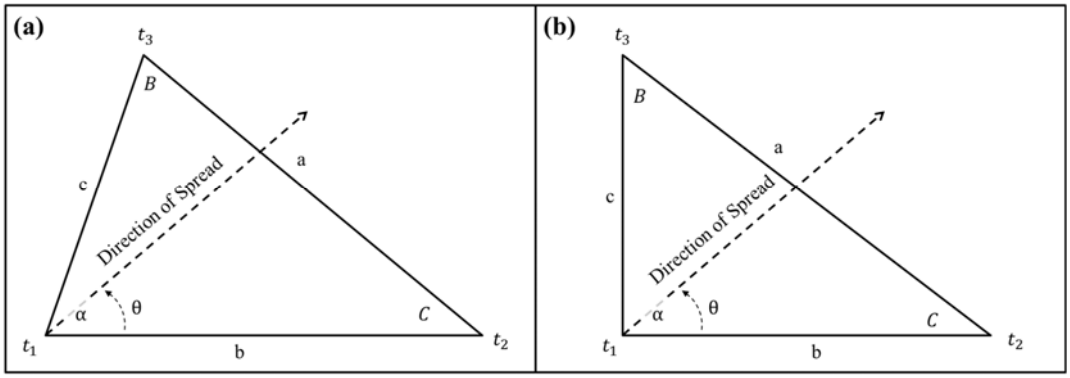

Figure S1. Distribution of the values needed to compute direction and rate of spread based on fire arrival time at three points forming a triangle according to the method of Simard *et al.* (1984). Here, the vertices $t_{1\text{-}3}$ report the arrival times (s) of the fire at each point; a, b, and c are the distances (m) between the vertices; α, B, and C are the angles formed at each vertex; and, θ is the direction of spread, given as the angle from side b at the vertex t_1. The general case for all triangles is shown in (**a**), while the special case where $\alpha = 90^{o}$ is presented in (**b**) which is the form used in the thermocouple grid array.

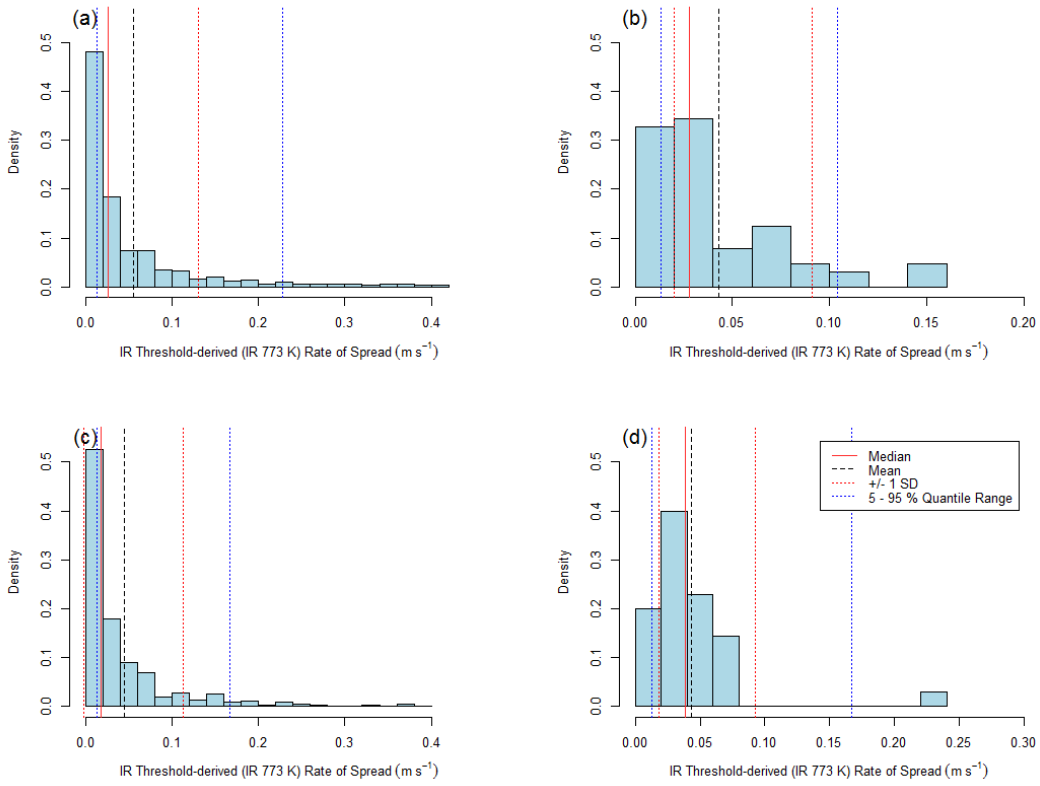

Figure S2. Normalised frequency distributions of rate of spread (RoS) values produced using the Paugam *et al.* (2013) 773 K method presented at varying sample scales; (**a**) all data points for the entire experiment; (**b**) median values for each row of every burn; (**c**) all data points for a single burn (June 14, 2013 burn 1); (**d**) all data points for a single time step (June 14, 2013 burn 1, t = ~70 s). Bin widths of 0.02 are used throughout all plots.

Table S2. Linear mixed modelling results summary for random effects.

Group	Type	Variance	Standard Deviation
Burn:Row	(intercept)	0.0003305	0.01818
Burn	(intercept)	0.0013728	0.03705
Row	(intercept)	0.0001388	0.01178
Residual		0.0009046	0.03008

Table S3. Linear mixed modelling results summary for fixed effects.

	Estimate	Standard Error	Degrees of Freedom	t value	p
Visible Side	5.704e-02	1.060e-02	8.500e+00	5.382	0.000546
Visible Nadir	1.359e-03	4.726e-03	4.203e+02	0.288	0.773777
Thermocouple Linear Array	1.198e-02	4.817e-03	4.219e+02	2.487	0.013266
Paugam et al. (2013)	-3.327e-03	5.105e-03	4.226e+02	-0.652	0.514956
Thermocouple Grid Array	-9.787e-03	8.320e-03	4.252e+02	-1.176	0.240140
Infrared Grid Array	6.334e-04	5.051e-03	4.226e+02	0.125	0.900258
Paugam et al. (2013) 773 K	-1.412e-02	5.188e-03	4.228e+02	-2.721	0.006776
Infrared Triangular Method	1.059e-02	5.188e-03	4.228e+02	2.041	0.041915