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Relative importance of black carbon, brown carbon, and absorption enhancement from clear coatings in biomass burning emissions

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Table S1: The slope of dry vs denuded absorption (denuded adjustment factor) for different days of analysis period. 405 nm is the adjustment factor for blue wavelength and 660 nm is adjustment factor for red wavelength.

Date	405 nm	660 nm
27-Oct	1.57	1.03
28-Oct	1.55	1.02
29-Oct	1.52	1.00
30-Oct	1.52	0.96
31-Oct	1.28	1.34
1-Nov	1.39	0.99
3-Nov	1.14	0.94
4-Nov	1.18	1.09
5-Nov	1.48	0.92

Table S2: Percentage of absorption due to BC, lensing (coating), and BrC due to BB aerosols at 532 nm estimated from three different approaches. ID is the fire ID assign during FLAME-4 for particular burns. The ratio in the rightmost column is the ratio in BrC absorption estimation by approach 2 over approach 1.

		Approach 1			Approach 2			Approach 3			
ID	Materials	BC	Coat	BrC	Ratio	Coat	BrC	BC	Coat	BrC	Ratio
129	Pine	75	6	19	48	3	49	48	10	42	2.58
142	Pine	69	13	18	59	13	29	59	22	19	1.61
144	pine	58	25	17	44	20	36	44	29	27	2.12
130	California rice straw	87	3	10	68	3	29	68	13	19	2.90
143	California rice straw	58	6	36	42	5	54	42	11	48	1.50
131	Black Spruce	78	4	18	64	4	32	64	14	22	1.78
134	Black Spruce	74	14	13	60	11	29	60	21	19	2.23
138	Organic Hay	NA	NA	NA	59	22	19	59	33	8	NA
146	Organic Hay	67	4	30	57	0	44	57	6	36	1.47
132	Organic Wheat	84	1	15	71	1	28	71	11	18	1.87
149	Organic Wheat	78	11	10	60	8	32	60	18	22	3.20
139	Giant saw grass	100	0	0	100	0	0	100	0	0	-
148	Giant saw grass	NA	NA	NA	NA	NA	NA	73	10	17	NA
133	Conventional Wheat	81	2	18	67	2	31	67	11	21	1.72
135	Chamise	94	0	6	80	0	21	80	10	10	3.50
136	Manzanita	92	0	8	83	0	18	83	11	6	2.25
414	wire grass	100	0	0	100	0	0	100	0		-
147	Sugar cane	60	7	33	45	5	50	45	12	44	1.52
150	NC peat	56	4	40	41	1	58	41	7	52	1.45

Table S3: Fitting coefficients for percentage of absorption due to BrC as a function of AAE (Absorption = a + b * log(AAE)) and as a function of EC/OC (log(Absorption) = a + b* log(EC/OC)) with Pearson's r values for each fit. Numbers in parentheses are 1 standard deviation of the fitting coefficients.

	Wavelengths	Approaches	a	b	r
Fitting with AAE	405 nm	1	-28.90 (± 4.62)	136.05 (± 9.14)	0.97
		2	1.27 (±2.1)	121.94 (±4.28)	0.99
		3	-29.02 (±2.61)	157.33 (±5.27)	0.99
	532 nm	1	-7.86 (± 5.45)	56.51 (± 10.80)	0.82
		2	-1.01(±5.45)	73.90 (±10.80)	0.88
		3	-11.69 (±5.82)	78.45 (±11.7)	0.86
Fitting with EC/OC	405 nm	1	0.97 (±0.16)	-0.51 (±0.15)	-0.77
		2	1.50 (±0.07)	-0.26 (±0.07)	-0.8
		3	1.04 (±0.15)	-0.56 (±0.15)	-0.79
	532 nm	1	0.81 (±0.09)	-0.41 (±0.08)	-0.86
		2	1.24 (±0.06)	-0.28 (±0.06)	-0.86
		3	1.09 (±0.10)	-0.30 (±0.10)	-0.72

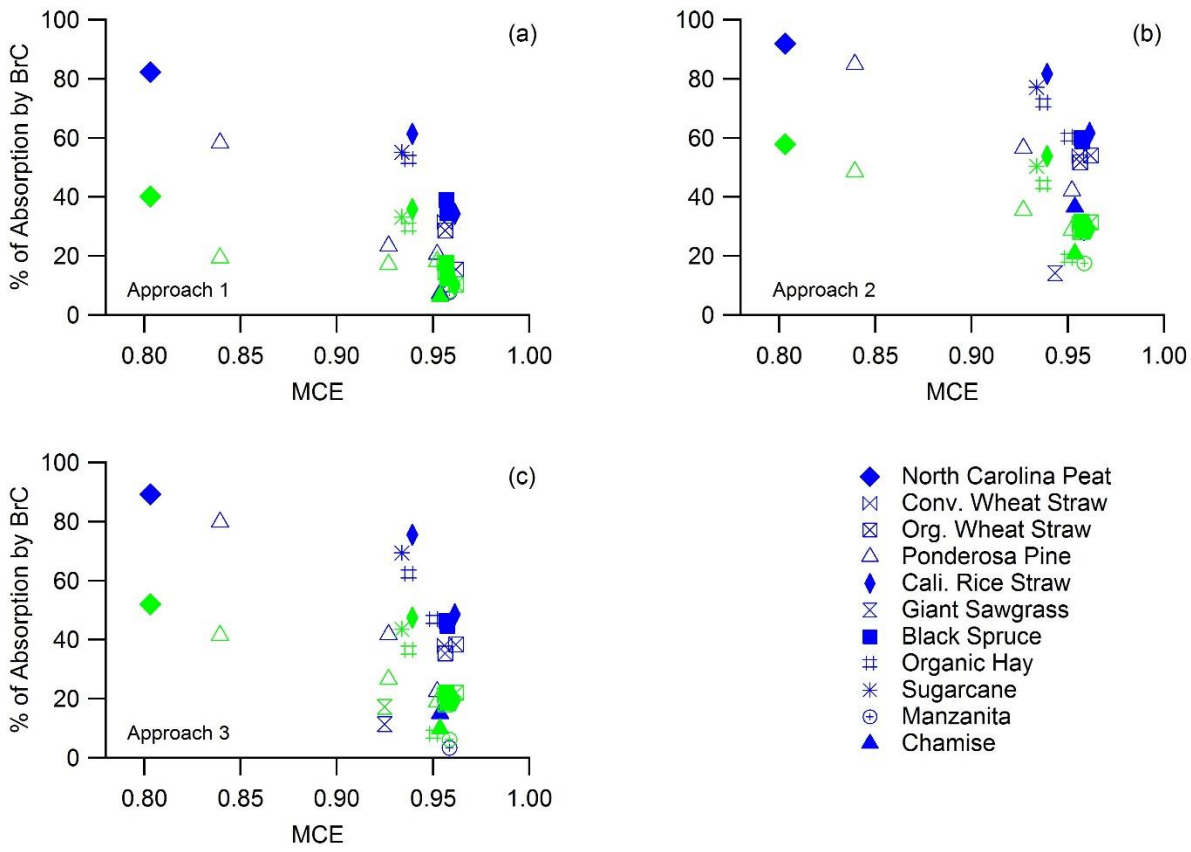

Figure S1: Percentage of absorption due to BrC vs. MCE. (a) approach 1, (b) approach 2, and (c) approach 3. Blue symbols are for absorption at 405 nm and green symbols are for absorption at 532 nm.