



Supplement of

A 2-year intercomparison of three methods for measuring black carbon concentration at a high-altitude research station in Europe

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Supplement

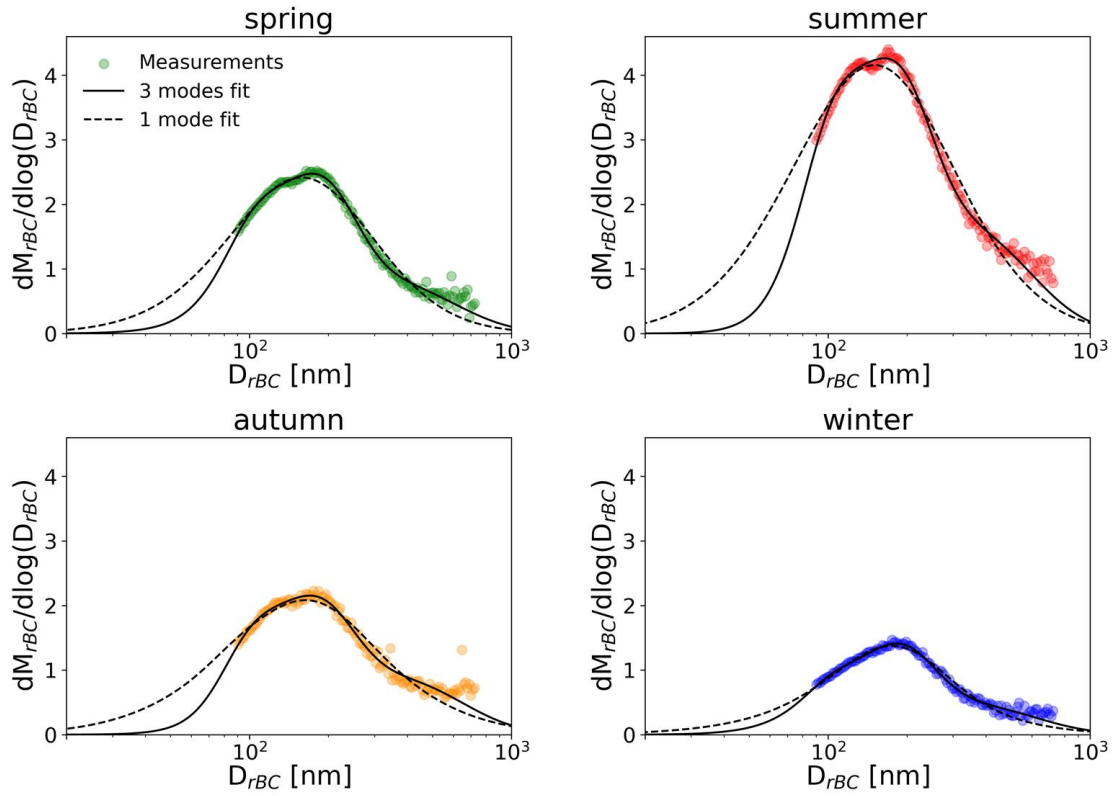


Figure S1: rBC size distribution measured in colored dots and fitted with one (dashed black line) or three (solid black line) lognormal modes for 2019 and 2020 at the PDM grouped by seasons.

		Winter (DJF)	Spring (MAM)	Summer (JJA)	Autumn (SON)	All data
Mass conc. all data [ng.m⁻³]	rBC,corr median (25th, 75th)	5.59 (2.12,12.0)	17.9 (8.42, 43.3)	55.3 (24.6 85.5)	16.9 (4.61 156.1)	21.2 (6.54, 62.0)
	rBC,corr mean (stand. dev.)	17.7 (42.0)	31.6 (34.7)	61.4 (48.8)	33.5 (39.4)	39.4 (45.7)
	EC median (25th, 75th)	41.0 (36.0, 47.0)	48.0 (42.0, 66.0)	59.0 (54.0, 88.0)	46.0 (39.0, 62.0)	47.0 (38.0, 63.3)
	EC mean (stand. dev.)	40.1 (12.4)	49.6 (25.0)	72.6 (34.0)	48.2 (13.7)	52.6 (26.0)
	eBC median (25th, 75th)	20.7 (12.1, 48.3)	73.4 (31.4, 151)	124 (37.9, 201)	18.1 (10.4, 46.2)	39.0 (16.0, 130)
	eBC mean (stand. dev.)	47.4 (63.4)	98.4 (78.8)	127 (89.2)	42.6 (55.6)	78.5 (81.7)
Mass conc. (only include data when pairs values are available) [ng.m⁻³]*	rBC,corr median (25th, 75th)	11.4 (8.21,18.1)	32.3 (14.8, 46.3)	59.1 (37.7,66.6)	22.6 (8.21,55.2)	28.6 (14.1,55.5)
	rBC,corr mean (stand. dev.)	17.1 (16.7)	34.4 (23.8)	57.4 (24.9)	35.2 (31.1)	36.4 (28.4)
	EC median (25th, 75th)	41.0 (37.0 , 47.0)	50.0 (42.0, 66.0)	59.0 (54.0 ,89.5)	45.5 (38.8, 62.3)	47.0 (39.0, 65.0)
	EC mean (stand. dev.)	42.2 (9.18)	54.5 (22.6)	73.5 (35.3)	47.7 (14.0)	54.7 (25.3)
	eBC median (25th, 75th)	29.4 (21.8, 35.8)	66.1 (46.2, 84.3)	129 (104, 167)	57.5 (29.3, 105)	65.5 (32.8, 118)
	eBC mean (stand. dev.)	30.7 (12.2)	69.7 (31.8)	138 (48.3)	70.9 (47.4)	78.5 (54.3)

Table S1. Corrected rBC, EC and eBC mean and median mass concentrations grouped by season and over the campaign. Standard deviations and 25th and 75th percentiles are given in parenthesis.

***Statistics are given for pairwise data (i. e. data when all variables were available) in order to compare the results of the different measurement methods.**

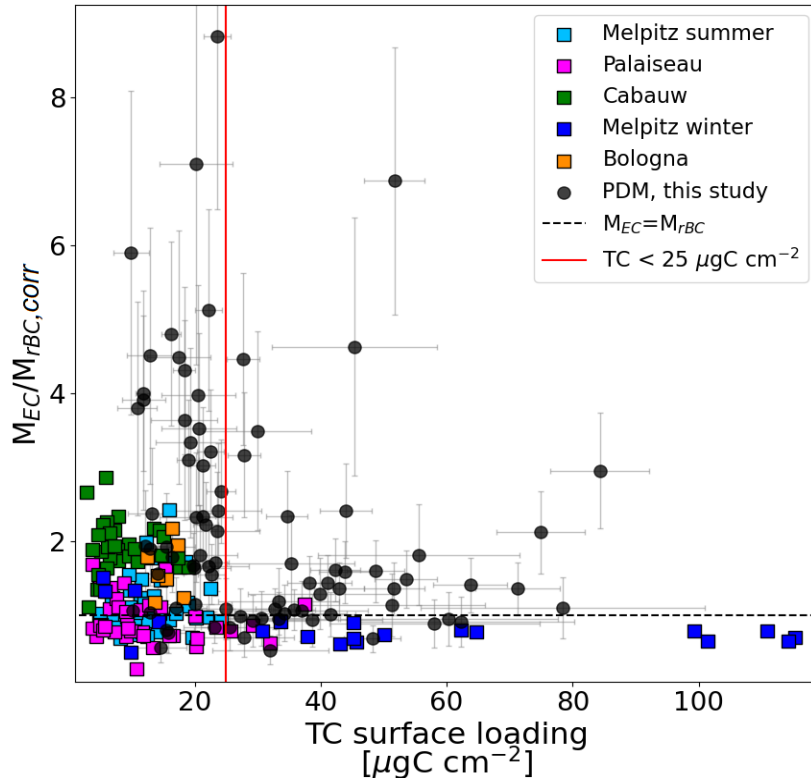


Figure S2: $M_{EC}/M_{rBC,corr}$ ratios as a function of the TC surface loading on the filter. The red line corresponds to a TC surface loading of $25 \mu\text{gC cm}^{-2}$, which is the threshold below which M_{EC} values were invalidated. The colored points are from Pileci et al. (2021) and the black dots are the PDM data.

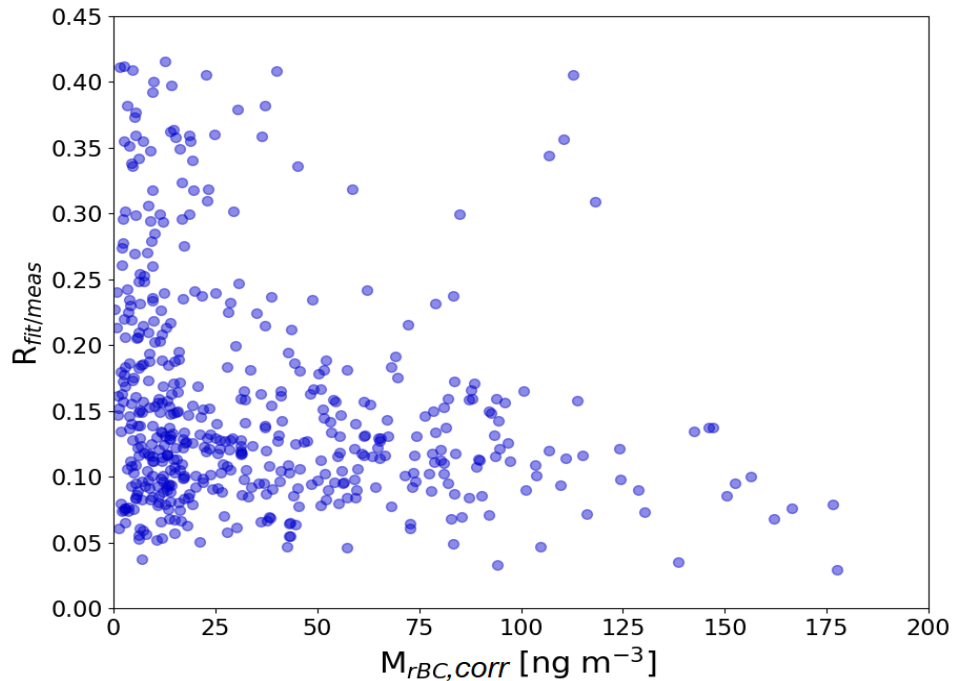


Figure S3: $R_{fit/meas}$ as a function of $M_{rBC,corr}$. Data are in a 1-day time resolution.