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Brown carbon absorption in the red and near-infrared spectral region

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The data of figure 3 are summarized in table S1. The CLAP and aethalometer data at similar wavelengths were measured at the same time.

	Wavelenght (nm)	Absorption coefficient (Mm^{-1})			
		Black locust		Norway Spruce	
		Weingartner	Schmid	Weingartner	Schmid
Aethalometer	370	535.57	615.98	582.45	674.15
	470	353.10	367.47	368.54	384.19
	521	260.28	262.02	263.04	264.20
	590	181.75	176.73	178.64	172.64
	660	153.04	145.55	145.27	136.39
	880	53.23	49.10	45.77	40.95
	950	39.93	36.76	33.49	29.76
CLAP	467	340.14		382.03	
	528	247.94		270.54	
	652	128.61		132.66	

Table S1. Absorption coefficient measured by the aethalometer and the CLAP

For the calculation of the index of refraction of tar balls we used those data which were measured parallel to the size distribution measurements. Table S2 summarizes the scattering and absorption coefficients served as input data for the Mie calculations. The data in the table are corrected by the correction factors obtained from the nigrozin measurements. For the absorption coefficient this correction factor was 1.098 and that for the scattering coefficient it was 0.614. The correction factor for the absorption is within the estimated 25% error. Concerning the correction factor for scattering, it is important to note, that Massoli et al., (2009) found that the uncertainty of the scattering coefficient measured by a TSI nephelometer can be 25-30% for particles with single scattering albedo of 0.4 and 16-18% when the SSA is 0.5. The single scattering albedo of nigrosin particles were on average 0.41 calculated from the measured absorption coefficient at 652 nm and from the extrapolated scattering coefficient at 633 nm. Since the SSA of tar ball particles at 652 nm (using the uncorrected data) was on average 0.53, the correction might be also applied for the generated tar balls, resulting 10-20% uncertainty.

	S467*	A467	S550	A550*	S652*	A652	S700	A700*	S880*	A880*	S950*	A950*	AE880	AE950
Bl. d1	195.2	363.2	133.7	235.7	78.1	140.8	64.3	115.1	34.3	60.1	27.8	48.4	52.6	39.3
Bl. d2	200.9	385.6	138.7	249.1	80.6	148.3	66.4	121.0	35.5	62.8	28.8	50.4	61.4	45.9
Bl. d3	206.2	377.5	142.8	244.7	83.8	146.2	69.2	119.4	37.4	62.3	30.4	50.1	68.1	51.3
Bl. d4	204.9	428.9	136.9	274.2	76.6	160.9	62.1	130.6	31.6	66.7	25.2	53.2	52.6	39.2
Ns. d1	208.9	333.9	143.4	207.9	81.2	117.7	66.4	94.3	34.7	46.1	27.9	36.3	38.8	27.9
Ns. d2	243.4	354.8	167.3	218.7	95.0	122.8	77.8	98.0	40.8	47.3	32.9	37.1	46.2	33.7
Ns. d3	216.6	347.7	147.4	213.4	83.3	119.4	68.0	95.1	35.3	45.7	28.3	35.7	46.0	33.5
Ns. d4	224.6	363.2	153.4	224.6	87.4	126.7	71.5	101.2	37.4	49.2	30.1	38.6	50.4	37.1
Ns. d5	222.4	371.0	150.9	228.3	84.7	128.1	69.0	102.2	35.6	49.3	28.5	38.6	42.9	31.5
Ns. d6	244.4	415.5	166.2	255.5	93.6	143.4	76.3	114.3	39.5	55.1	31.7	43.2	50.5	37.1
Ns. d7	264.2	457.9	179.7	279.8	101.0	155.9	82.3	123.9	42.6	59.2	34.2	46.2	43.4	31.9
Ns. d8	303.0	489.5	206.8	297.8	117.4	165.4	95.9	131.3	50.1	62.4	40.3	48.7	55.6	40.9

Table S2: The scattering (S) and absorption (A for the CLAP and AE for the aethalometer) coefficient (Mm^{-1}) of tar balls at different wavelengths served as input parameters for the calculation of the index of refraction.

* indicate that the data were extrapolated

Bl. – Black locust

Ns. – Norway spruce