

S1 Particle size distributions

Figure S1 shows fractional lognormal fits to the number size distributions for each aerosol deposited onto the snow surface, which were measured in a laboratory setting. We have reproduced these distributions using Eq. (S1):

$$df = \frac{1}{\sqrt{2\pi} \ln \sigma_g} \exp\left(-\frac{(\ln d_p - \ln d_g)^2}{2(\ln d_g)^2}\right) d \ln d_p , \quad (\text{S1})$$

where σ_g is the geometric standard deviation d_g is the geometric mean diameter (or count median diameter), and d_p is the particle diameter. The values of σ_g and d_g for each aerosol tested are shown in Table S1.

Hematite (Fe_2O_3) was procured from Powder Technologies, Inc. (Burnsville, MN, USA), which provided the artificially-produced iron oxide powder with a 0-10 μm nominal size range. Particle size information was provided by the company as tested at their facility, but the production process of this aerosol was not specified.

Black carbon (BC) aerosol was produced using a common kerosene lamp, which has been used to produce black carbon as a test aerosol for many studies and calibrations (e.g., Arnold et al., (2014), Arnott et al., (2000), Lewis et al., (2008), Sheridan et al., (2005), Virkkula et al., (2005)). Conditions used for this aerosol production method were very similar to those of Arnold et al., (2014), so we use the values of particle number concentration estimated therein for fresh BC generation.

Brown carbon (BrC) aerosols were produced in the same manner as described by Chakrabarty et al., (2016) and Samburova et al., (2016). As such, we use the particle size distribution values from combustion experiments of the measured BrC emission using the SMPS (TSI Inc.) data for a peat fuel moisture content of 25%. The data presented represent those corrected for diffusion losses (following TSI Incorporated, (2012) and references therein).

S2 References

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Normalized Number Size Distributions

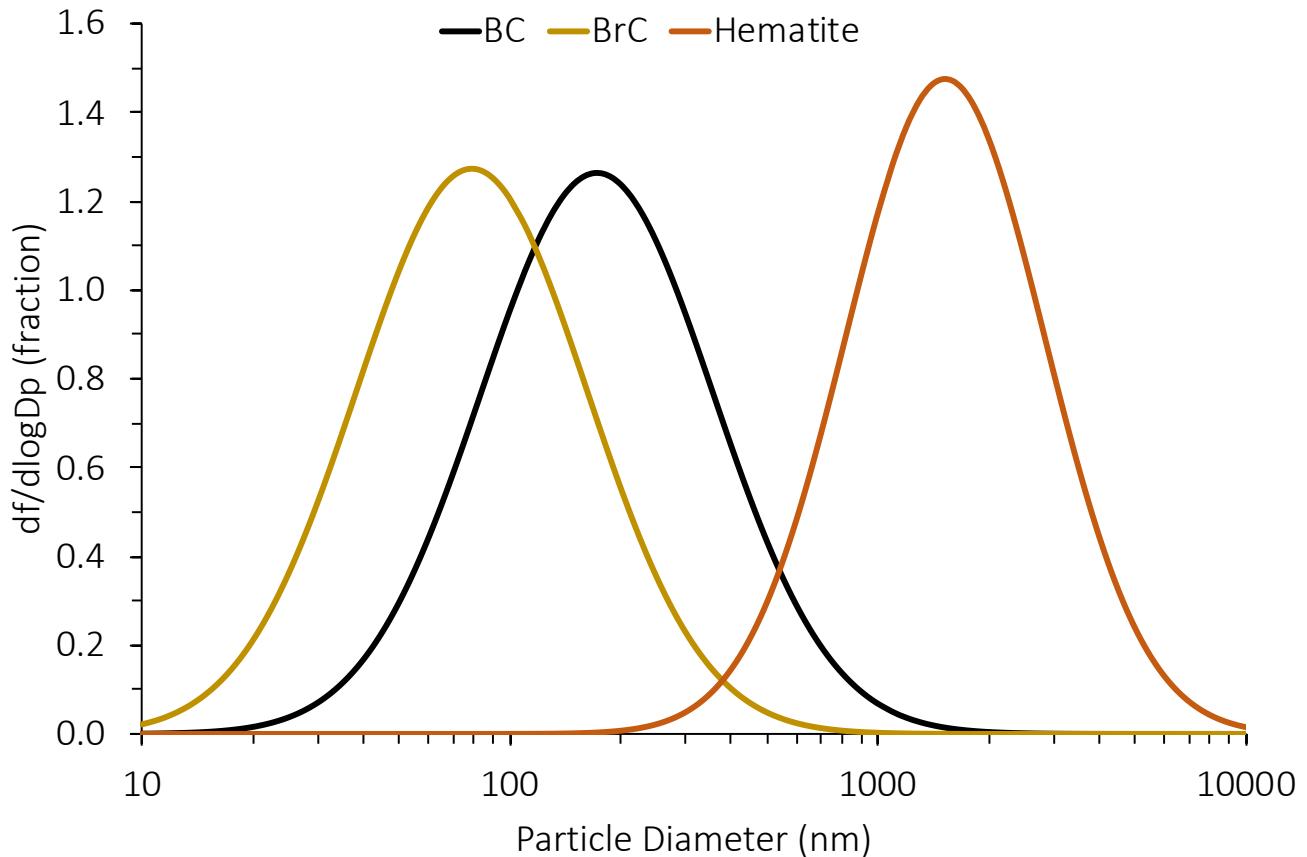


Fig. S1: Normalized number particle size distributions for each aerosol tested.

Table S1: Parameters for lognormal size distribution

Aerosol	Count Median Diameter (nm)	Geometric Standard Deviation
Black Carbon (BC)	163	2.06
Brown Carbon (BrC)	79	2.06
Hematite (Fe ₂ O ₃)	1530	1.86