Supplement of Atmos. Chem. Phys., 20, 9701–9711, 2020
https://doi.org/10.5194/acp-20-9701-2020-supplement

Atmospheric Chemistry and Physics
Open Access
EGU

Supplement of

The absorption Ångstrom exponent of black carbon with brown coatings: effects of aerosol microphysics and parameterization

Xiaolin Zhang et al.

Correspondence to: Xiaolin Zhang (xlnzhang@nuist.edu.cn) and Mao Mao (mmao@nuist.edu.cn)

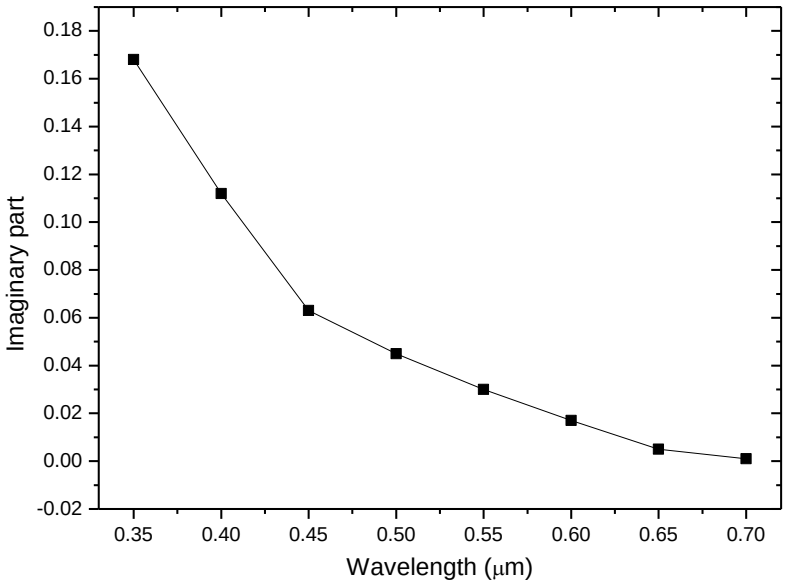

Fig. S1. Imaginary part of refractive index of brown carbon as a function of wavelength based on Kirchstetter et al. [2004].

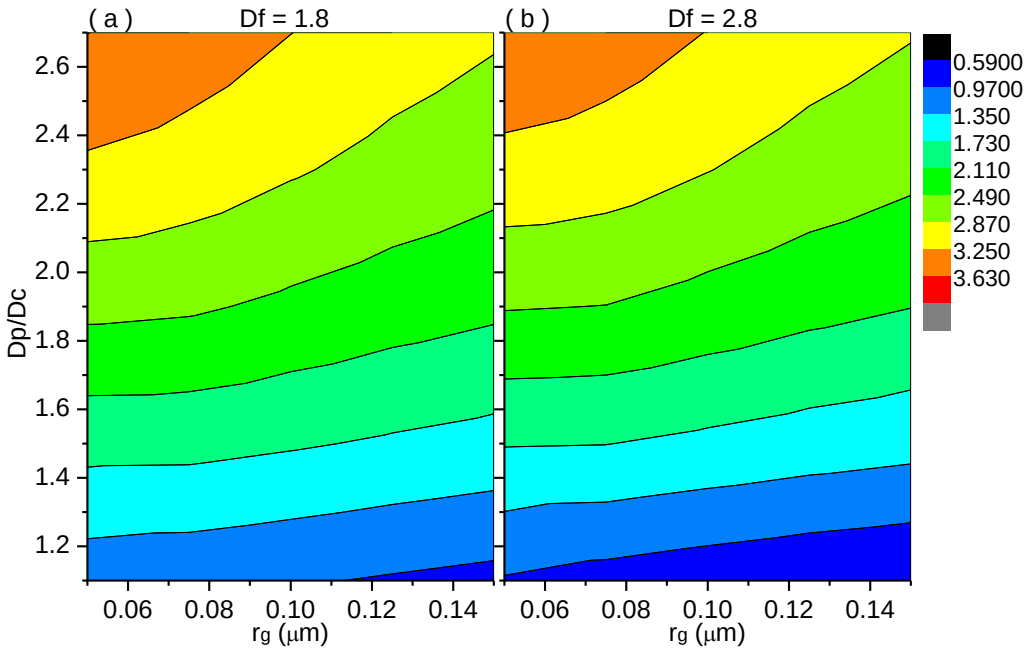

Fig. S2. The absorption Angstrom exponent (AAE) of BC aggregates coated by brown carbon with different shell/core ratio (D_p/D_c) and particle size distribution. BC fractal dimension of 1.8 and 2.8 are shown from left to right. Coated volume fraction of BC is 0.0, and geometric standard deviations (σ_g) for applied lognormal distribution are 1.59.

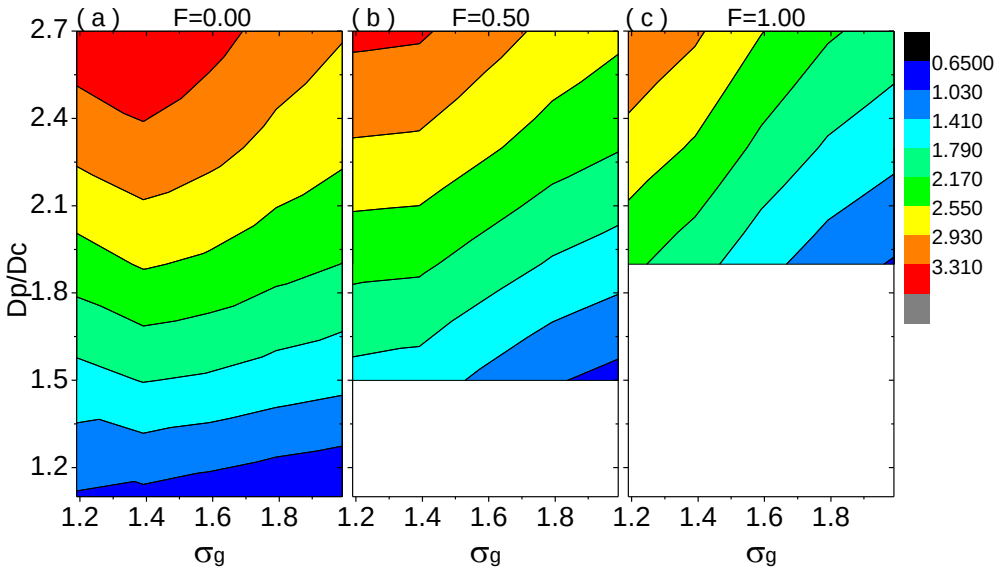

Fig. S3. The absorption Angstrom exponent (AAE) of BC aggregates (BC fractal dimension of ~2.8) coated by brown carbon with different shell/core ratio (D_p/D_c) and particle size distribution. Three coated volume fractions of BC, being 0.00, 0.50, and 1.00, are shown from left to right. For fully coated BC structure, BC is located at the particle geometric center. The geometric mean radii (r_g) for applied lognormal distribution are 0.075 μm.

Reference

Kirchstetter, T. W., Novakov, T., and Hobbs, P. V.: Evidence that the spectral dependence of light absorption by aerosols is affected by organic carbon, J. Geophys. Res., 109, D21208, 2004.