

# ***Interactive comment on “Dynamic shape factor and mixing state of refractory black carbon particles in winter in Beijing using an AAC-DMA-SP2 tandem system” by Xiaole Pan et al.***

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It is an interesting paper. The dynamic shape factor and the mixing state of rBC-containing particle in atmosphere indeed need to be studied.

However, I do not quite understand the calculation of dynamic shape factor (Line206), the author pointed out that  $\chi$  and Dve can be calculated out by combining equations (4) and (6), here you have 2 equations but have 3 unknown variables:  $\chi$ , Dve, and the density of particle. It is mathematically impossible to solve this equation set.

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Or did the authors assume a value for the density of particle? There is no mention in the paper. If that is the case, I am also wondering how they chose a value for the density of particle, as atmospheric aerosols are so complicated that it is unlikely their density was a constant.

Please also note the supplement to this comment:

<https://www.atmos-chem-phys-discuss.net/acp-2019-433/acp-2019-433-SC1-supplement.pdf>

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