

Comment

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 χ and D_{ve} can be calculated out by combining equations (4) and (6), they are expressed as $D_{ve} = \sqrt[3]{\frac{D_{ae}^2 D_{mob} C_c(D_{ae}) \rho_0}{\rho_p C_c(D_{mob})}}$ and $\chi = \frac{C_c(D_{ve}) D_{mob}}{C_c(D_{mob}) D_{ve}}$. Here you have 2 equations but have 3 unknown variables: χ , D_{ve} , and ρ_p . It is mathematically impossible to solve this equation set.

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