

# ***Interactive comment on “Effects of brown coatings on the absorption enhancement of black carbon: a numerical investigation” by Jie Luo et al.***

## **Anonymous Referee #1**

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This is a solid contribution on an important subject. I appreciate the authors' use of state-of-the-art modeling techniques for the study of soot-containing aerosols with highly complex morphologies. The technical content of the paper appears to be correct, and the conclusions are well justified. I have only three minor comments.

1. In Section 2.3, an appropriate generic reference for the DDA would be J. Quant. Spectrosc. Radiat. Transfer 106, 558-589 (2007).
2. The authors model randomly oriented nonspherical aerosols. The use of the model of randomly oriented particles has two aspects (see the recent rigorous analysis in Optics Letters 42, 494-497 (2017)). First, the orientation distribution function must have

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a specific mathematical form, so I wonder whether this is the case with the computer program used to calculate light scattering. Second, technically speaking, the computation for a nonspherical particle must be supplemented by the computation for its mirror image. I wonder whether this was done, or it was found that the two computations yield very close results. These two issues need to be clarified.

3. The authors' analysis of the differences between the effects of absorbing and nonabsorbing shells is quite interesting. It would be instructive to compare their observations with those in *Optics Letters* 39, 2607-2610 (2014).

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