

Interactive comment on “Exploiting simultaneous observational constraints on mass and absorption to estimate the global direct radiative forcing of black carbon and brown carbon” by X. Wang et al.

Anonymous Referee #2

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The authors present an investigation into the direct radiative forcing from black carbon and brown carbon, incorporating various observational constraints, using the GEOS-Chem model and its associated radiative transfer model.

They support both earlier studies and other papers in discussion in their conclusion that the atmospheric lifetime of BC, on global average, needs to be reduced in present models to be better able to reproduce e.g. the HIPPO dataset.

Further, they show how recent studies may have overestimated the RF of BC through not taking properly into account the absorbing component of brown carbon. They also

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provide an estimate of the global, annual mean RF from BrC.

In all, the study is well designed and executed, and thoroughly documented. The conclusions are of broad interest to the community. While I'm sure the method used and analysis choices made may become the subject of discussion (in particular, perhaps, the use of AERONET AAOD values), they are well presented in the paper and their consequences discussed.

I recommend that this paper be published in its present form, subject only to proof reading.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 17527, 2014.

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