

Interactive comment on “Present-day radiative effect from radiation-absorbing aerosols in snow” by Paolo Tuccella et al.

Anonymous Referee #3

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Recommendation: Major revision

General comments

By performing a set of simulations using the GEOS-Chem global chemistry and transport model this study investigates the present-day radiative forcing (RF) of radiation absorbing aerosols (RAA), namely Black carbon (BC), brown carbon (BrC) and soil dust, in snow. The study quantifies global mean RF for different RAA species and its seasonality. The study further analyses some regional characteristics of RF for different RAA species and estimated its uncertainty. The topic is an interesting one and the paper is worth of publication. However, there are some specific comments listed below that need to be addressed to improve the quality of the paper. The paper, therefore, needs a major revision before it can be acceptable for publication.

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Major comments

1. What are new results or advances of understanding RF of RAA in this study in comparison with existing literatures? This aspect shall be improved in abstract and conclusion. 2. What are implications of this study? Some comments on this would improve the quality of the paper. 3. Section 2 on Method is too long (from page 4 to page 10) and there is no need for such detailed descriptions in each sub-section in this part. This part needs to be shortened considerably. 4. Authors need to read the paper carefully and to check English usages and possible errors.

Minor comments

1. Lines 9-10 on page 1. “a 5-years simulation”. Shall be “a set of 5-year simulations”? 2. Line 296. “these information” to “this information” 3. Line 299. “we the 5-year” to “the 5-year”. 4. Line 368. “shew”. Do you mean “showed”? Please also check other places. 5. Font used in panels of Figure S3 is too small. Suggest increasing font size or giving more detailed figure caption.

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