

***Interactive comment on* “Biomass burning induced surface darkening and its impact on regional meteorology in eastern China” by Rong Tang et al.**

Anonymous Referee #1

Received and published: 1 January 2020

This manuscript explores how biomass burning impacts surface albedo and regional meteorology using radiosonde, satellite retrievals, reanalysis data and the WRF-Chem model. It is well organized and written. The results demonstrate improvements in modeling meteorology during biomass burning seasons. It is worth to be published in ACP after addressing the following issues.

My major concern is on the treatments of changes in surface albedo in the model. Observed changes in albedo for shortwave and near infrared are $-0.02\sim-0.06$, and $-0.06\sim-0.1$. The largest decrease of -0.1 was used in the ABD run, while changes of about -0.05 occurred more frequently. Will this treatment overestimate the impacts of

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biomass burning in the model? Could you discuss how this will affect your conclusion.

Page 6, line 190-191: why abnormal signal of surface warming happens in the down-wind direction? Is fire induced surface warming treated in your model?

Minor suggestions

Page 1, line 8: impacts air quality

Page 1, line 13: show that surface

Page 1, line 15: show a positive deviation

Page 4, line 102: meteorological observations from

Page 7, line 221: “and the behind physical images has” to “and the underlying physical images have not ”

Page 7, line 222-224: please rephrase this sentence to make it easier to read

Page 9, line 262: change the sentence to “A typical and severe burning episode in 2012 was chosen as the study case.”

Page 9, line 279: naturally induced

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-957>, 2019.

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