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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A new statistical approach to improve the satellite based estimation of the radiative forcing by aerosol–cloud interactions" *by* Piyushkumar N. Patel et al.

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The authors have dealt with my suggestions made during preliminary review. Thank you for helping me better understand your study. I had missed that improvement of RMSE was large in my first read through. Overall the paper is well written and referenced. In regards to the choice of region, I think the discussion does a good job of making the case for South Asia being the most challenging test case for new methods.

Authors: We express our sincere thanks to the anonymous referee for his/her insightful and constructive comments and suggestions on this study. The comment/suggestions were to-the-point and very valuable for us to improve the scientific and technical clarity and quality of the manuscript. In the following, we itemize our point-by-point response

to each of the concerns raised by the referee.

Comment:1 Line 133: I think there is a typo on this line.

Authors: The sentence is rewritten in the revised manuscript.

Comment:2 Line 168: How much of an impact does the simplified surface albedo have? I would have thought that the calculation would have some sensitivity to whether it was looking over a forest or farmland. Maybe it averages out, but it seems like it might be enhancing the authors' calculation error. Sea surface albedo also varies a lot depending on meteorological conditions [Jin et al., 2011].

Author: In the present study, the surface albedo is used to simulate RFaci using the RT model, therefore the simulated values of RFaci are sensitive to the choice of the surface albedo but not the one computed using the statistical relationship between satellite based measurements. To estimate the sensitivity of the simulated RFaci to surface albedo in response to the reviewer's remark, we used different plausible values of surface albedo in sensitivity simulations with radiative transfer model to assess its impact on the simulate the RFaci and to compute the uncertainty statistics. These statistics are now reported in the revised manuscript and presented as supplementary material.

Comment:3 Line 230: There might be a typo on this line discussing RMSE reduction.

Author: The sentence is revised and rewritten in the revised manuscript.

Comment:4 Line 262: There is a typo in the last sentence. I have no other major suggestions relating to this paper and find it acceptable for publication pending minor revisions and grammar corrections.

Author: The sentence is rewritten in the revised manuscript.

Please also note the supplement to this comment:
http://www.atmos-chem-phys-discuss.net/acp-2016-680/acp-2016-680-AC1-

supplement.zip

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