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Discussions

Interactive comment on "Technical note: Absorption aerosol optical depth components from AERONET observations of mixed dust plumes" *by* Sung-Kyun Shin et al.

Anonymous Referee #6

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Review on Technical note: Absorption aerosol optical depth components from AERONET observations of mixed dust plumes By Shin et al. AMT-2018-311

The authors suggest a methodology to separate the contributions of dust and non-dust aerosol to total AOD measured with AERONET sun photometers based on lidar parameters. I think that the methodology can be a useful tool for interpreting the data of ground-based photometric observations and validating the spaceborne remote sensing observations. The manuscript is within the scope of AMT.

General comments:

The approach, suggested by the authors, is designed to retrieve AAOD for non-dust

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aerosol in mixed dust plumes. The formulas, they present, pertain to the case when aerosol is considered as a vertically homogeneous layer. Even if the authors will take into consideration the comments of other reviewers regarding these formulas, the approach will still rely upon the assumption on vertical homogeneity. Evidently, in passing to measurement results, we cannot expect that this assumption will be fulfilled: dust and non-dust aerosols may be separated in altitude. Therefore, if this methodology is to be considered as a "guide for action", a cycle of additional numerical and field experiments is at least required. Of course, that is unnecessary to be done within the given manuscript, but does need to be done in the future. In addition to the issue of vertical inhomogeneity, it would be interesting to see the results concerning the following aspects: (1) absorption in not only black carbon, but also in brown carbon, which is shifted to UV region of the spectrum; (2) effect of uncertainty in retrieving the aerosol characteristics by the standard AERONET algorithm on the AAOD retrievals, based on this method

All technical shortcomings, noted by me, have already been indicated by other reviewers and are hoped to be accounted for in the final version of the manuscript.

Please also note the supplement to this comment:
https://www.atmos-meas-tech-discuss.net/amt-2018-311/amt-2018-311-RC6-supplement.pdf

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2018-311, 2018.