

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

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P2, Ln15: “Russell et al. (2010) utilized AERONET-retrieved SSA, AAOD, and absorption Ångström exponent (AAE) as indicator to separate the contributions of BC, organic matter (OM), and mineral dust to the absorbing aerosol fraction.” That is incorrect: This work suggested a preferred classification scheme, not a “separation”.

P2, L21: “... and to infer the fine or coarse mode fraction in the aerosol size distribution” What does it mean?

P3, L10: “The uncertainty in SSA is expected to be of the order of 0.03 (Holben et al.,

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1998).” The reference is incorrect.

Eq. (4) in my view is incorrect. The correct equation for the measured backscattering should be something like $\text{Beta} = f_{\text{dust}} \cdot \text{Beta}_{\text{dust}} + f_{\text{nd}} \cdot \text{Beta}_{\text{nd}}$, where $f_{\text{dust}} = \text{AOD}_{\text{dust}} / \text{AOD}$, $\text{AOD} = \text{AOD}_{\text{dust}} + \text{AOD}_{\text{nd}}$. If phase functions of dust and non-dust are very different, and they usually are because of the particle size difference, then Eq. (4) is not correct.

I may be wrong as I did not work with the lidars before. But if I am correct, then this error (or assumption) propagates in all derivations below. I suggest a major revision with authors addressing this key point first.

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