Atmos. Meas. Tech. Discuss.,
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Atmospheric Measurement Techniques 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 #1

Received and published: 14 November 2018

Manuscript touches important problem: separation the components of aerosol mixture characterized by different absorbing properties basing on AERONET measurements. Manuscript is clearly written, provides new useful results and is suitable for publishing in AMT.

Referees #3 and #4 provided extended comments, so I have just several notes.

For separation of dust and non dust components authors use depolarization ratio re-calculated from AERONET inversions. So I wonder if such separation can be done directly from spheroids volume fraction. I think authors should explain necessity of using lidar related characteristics.

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Discussion paper

p.2 ln.10. “BC as emitted from incomplete anthropogenic combustion or biomass burning is generally considered the main light absorber among atmospheric aerosols” Actually contribution of brown carbon to absorption can be also significant. I think authors should comment it.

p.4 ln.12. Authors assume depolarization of non dust particles to be of 0.02. Actually depolarization ratio of smoke varies in a wide range and can exceed 10% (Butron et al, 2012). How such variations may influence results?

Eq(5). Authors introduce the layer thickness “h” but looks like never use it later.

p.4.ln.28. “We take the values of 44 sr and 54 sr for Asian and Saharan dust, respectively” Lidar ratios even for pure dust can vary in a wide range. This should be commented.

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