Interactive comment on “Absorption Angstrom Exponent in AERONET and related data as an indicator of aerosol composition” by P. B. Russell et al.

Anonymous Referee #2

Received and published: 9 November 2009

With the employment of aerosol Absorption Angstrom Exponent (AAE) and Extinction Angstrom Exponent (EAE), the authors tried to determine aerosol compositions from AERONET and space-bore measurements. The combination of AAE with EAE extends the application of widely used AERONET data and provides a straightforward way to classify aerosol types into urban industrial, biomass burning, and dust from the cluster analysis. The results are convincing and solid. I recommend publication after stated revisions.

1. More detailed information about the data shown in Figure 1 and Figure 2 are necessary. About 6 different campaigns were included in these two figures, but no brief
introduction about any of these campaigns and the measurements. It’s very hard for
the audience to fully understand the results without any background knowledge about
the experiments and how the data were obtained.

2. Figure 4 showed data collected from 11 AERONET sites. However, the authors
didn’t provide any discussion about the data. Are those data the annual mean results
or just for specific season? For example, over Maldives, the switch of Indian monsoon
will bring different aerosols to the site, more marine aerosols during summer and more
continental aerosols in the winter. Thus, different AAE value and SSA spectral pattern
at different period might be observed at one site. For the site with distinct aerosol
sources, it’s crucial to identify the air mass and aerosol sources.

3. The effect of sea-salt aerosols on the results is missing. For the sites over the
remote ocean and near the coast, large amount of sea-salt will be detected and mixed
with other aerosols. The existence of sea-salt particles might affect aerosol size, EAE
value, and SSA spectral dependence. More discussion about the impact of sea-salt
aerosols on the findings is needed.

4. Figure 1 and 4 are not well presented. The markers are confusing.

5. One important publication showing SSA spectral dependence from AERONET data
is missing: Eck, T. F., et al. (2005), Columnar aerosol optical properties at AERONET
sites in central eastern Asia and aerosol transport to the tropical mid-Pacific, J. Geo-

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 21785, 2009.