

Interactive comment on “Light absorption properties of aerosols over Southern West Africa” by Cyrielle Denjean et al.

Anonymous Referee #1

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General Comments

The authors present an overview of in-situ measurements of aerosol optical properties made during the DACCIWA aircraft measurement campaign over the coastal region of Southern West Africa in summer 2016. The region has a varied aerosol environment, in which they sampled mineral dust aerosol, biomass burning aerosol, and anthropogenic pollution. Along with the meteorological situation, instruments on the aircraft measured the aerosol size and vertical distributions, and the aerosol scattering, absorption and extinction coefficients. From this information the authors further derived the aerosol scattering and absorption Ångström exponents, the complex refractive index, the single scattering albedo (SSA), the mass extinction efficiency, and the asymmetry parameter. Using this information, the authors describe the vertical distribution of the aerosols with

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respect to their optical properties, as well as showing that the SSA of the measured biomass burning aerosols is primarily a function of the imaginary part of the refractive index rather than of the size distribution. The derived SSA values of the biomass burning aerosols appear to be particularly low compared to other measurements from other regions of the world.

This is a very straightforward paper, and I appreciate that the scope of this work is primarily concerned with presenting the measurements and providing an interpretation of their significance. Within this scope, I would say that this is a successful paper, and hence I only have a few minor comments to make.

Specific comments

Figure 1: I assume that the black lines are the flight tracks in background conditions?

Section 2.2: as a qualitative comparison, I wonder if it would help to include one of these satellite images (MODIS or SEVIRI) over SWA with one of the flight tracks? This may be useful context to add and may aid the reader's understanding of the regional environment. Maybe such a figure may be more appropriate with respect to Section 2.3.2, and it may also be useful to have an image for each of the aerosol types.

Section 2.3.2: might it also be helpful to tabulate (briefly) the aerosol classification specifications? This may be helpful for quick reference when the reader wants to remind themselves of how the aerosols are classified in the later sections and figures.

Figure 5, labels: “wavelength”

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