

Interactive  
Comment

## ***Interactive comment on “Capturing vertical profiles of aerosols and black carbon over the Indian Ocean using autonomous unmanned aerial vehicles” by C. E. Corrigan et al.***

**Anonymous Referee #1**

Received and published: 6 September 2007

\*\*\*Overall

This is a nice paper. It presents vertical profiles of aerosol properties measured during a month long field campaign over the Indian Ocean. The authors first report various instrument comparisons to show that several new, miniaturized versions of off-the-shelf instruments are performing as desired. They then summarize their results from the field campaign showing that they sampled during two different airflow regimes. They used the regime of a persistent plume aloft to demonstrate the importance of airborne measurements (surface measurements miss such layers). Finally, they tie their results into the global AERONET network by comparing their in-situ measurements of absorption

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AOD with the AERONET derived value.

\*\*\*Scientific questions/issues

Page 11435, lines 23-25 I would suggest calling the converted absorption measurements 'equivalent black carbon' as opposed to just 'black carbon'. The phrase 'equivalent BC' at least implies there is some sort of conversion taking place. As you note and as the instrument name suggests, aerosol absorption is what is actually measured by absorption photometers/aethalometers. It should be noted that doing such a conversion from absorption to BC can lead to strange effects like having BC concentrations that vary as a function of wavelength if an appropriate spectral absorption cross section is not used.

Page 11436, - state how many missions were flown total

Page 11437, line 10 state whether data are corrected to STP or at ambient

Page 11441, lines 20-23 give total number of flights for which aerosol absorption profiles could be obtained.

Page 11443, lines 11-21 you discuss possible issues with your in-situ measurements to explain the differences between the AERONET and in-situ absorption AOD measurements. You may want to mention that there could be issues with the algorithm used to derive the AERONET measurement, e.g., what assumptions do they need to make to obtain absorption AOD?

Figure 6 would present more information as a scatter plot than as a time series; could even compare all 3 wavelengths on same plot and give fit equations.

\*\*\*Technical corrections

Page 11430, line 16 change seal to sea

Page 11432, line 26 change 'measured' to 'derived'

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Page 11433, line 24 give speed in m/s for comparison with air velocity below

Page 11435, lines 16-18 clarify whether the fluctuations in T and RH were for old or new instrument. I believe new instrument, but could be clearer.

Page 11439, line 5 spelling of 'occurring'

Page 11439, line 6 change mm to um (micrometers)

Page 11440, line 11 figure 10 says 23 March, text says 24 March

Page 11440, line 14 'below the mixed layer' change to 'in the mixed layer' or 'below plume altitude'

Page 11441, line 18 change 'measurements' to 'concentrations'

Page 11443, line 22 capitalize Angstrom

Figure 3 put in caption something to give scale, e.g., width of big box is 48 cm or whatever

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 11429, 2007.

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