

Interactive comment on “Transport and vertical structure of aerosols and water vapor over West Africa during the African monsoon dry season” by S.-W. Kim et al.

Anonymous Referee #1

Received and published: 22 January 2009

The paper uses several measurement platforms (in-situ, remote and satellite) to evaluate the vertical structure of aerosol over the West African Sahel in the dry season. Aerosol in the boundary layer was found to be large and therefore assumed to be dust, while smaller aerosol in elevated layers was assumed to be smoke aerosol based on back trajectory calculations which led to biomass burning regions. The biomass aerosol layers were also found to have relatively high water vapor mixing ratios. A similar layered structure of the aerosol was found in measurements from both 2006 and 2007 which show the aerosol transport pattern may be typical for the Sahel during the dry season. The mixing of the dust and smoke aerosol over the ocean into a single layer at a somewhat higher altitude in the free troposphere may indicate a fast and long

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range of transport of these aerosol across the Atlantic.

The paper demonstrates using multiple data sets to analyze the aerosol. The use of in-situ, remote and satellite measurements to confer similar results shows how these data sets can be used cooperatively. I would point out that Niger and the entire Sahel is a source region for dust. Unless there were strong winds I would assume that most of the dust measured in the lower atmosphere was local and not necessarily long-range transport from either the Saharan desert or from Mali.

The measurements of AOD at various pressure altitudes doesn't add much to the paper as I can't detect any changes in the AOD with altitude. It would be better to show only one plot for each month of the AOD. The wind vector changes with altitude are shown in Figure 2 and so don't need to be shown in Figure 1.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 1831, 2009.

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