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Interactive comment on "Observations of Saharan dust microphysical and optical properties from the Eastern Atlantic during NAMMA airborne field campaign" *by* G. Chen et al.

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We appreciate this thoughtful comment which kindly pointed out that we may have over-generalized our conclusion particularly in the value of single scattering albedo (SSA) for Sahara dust particles. In response, we will modify the manuscript to clarify that the reported average SSA value of 0.97 was based on NAMMA airborne observations which may represent the Sahara dust particles with size significantly smaller than 5 μm in aerodynamic diameter (The 4 μm size cut cited in the manuscript is incorrect). This SSA value may be viewed as an upper limit as the larger particles tend to have stronger absorptions. At the same time, we would like to clarify: 1) The NAMMA

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sampling inlet has been characterized during the past airborne tests, which showed a passing efficiency decreasing to 50% for particles with aerodynamic diameters at 5 μm. For Sahara dust particles, this is equivalent to a size cut at ∼4 μm based on the size conversion factor of 1.27. 2) The NAMMA particle size measurements did show the Sahara dust volume size distributions peak above 2 μm in Figure 5. This figure also clearly illustrates the effect of sampling inlet size cut. 3) The Mie-Scattering calculation did show significant contribution from the supermicron portion of the dust particles. Thus, the NAMMA results do include at least partially the supermicron Sahara dust particles. A question was raised about the value of the refractive index and the size distribution used in the SSA assessment, which resulted in a value of 0.94 for the supermicron dust particles. The best estimated refractive index value (i.e., 1.56 + 0.0022i) and the supermicron portion of the NAMMA observed dust particle size distributions was used to calculate the SSA value. The reported value was the average for all dust cases. We will add additional text to better explain how this SSA value was derived. Furthermore, the estimated imaginary refractive index value represents a lower limit value since NAMMA observations under-sampled the particles larger than ∼4 μm.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 13445, 2010.

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