

Interactive comment on “Testing aerosol properties in MODIS (MOD04/MYD04) Collection 4 and 5 using airborne sunphotometer observations in INTEX-B/MILAGRO” by J. Redemann et al.

Anonymous Referee #1

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This paper compares aerosol optical depth (AOD) retrievals using the 14-channel Ames Airborne Tracking Sunphotometer (AATS), which can be considered a reference instrument, to AODs retrieved using the MODIS instruments on Terra and Aqua satellites. The comparisons are over the Gulf of Mexico, coincident in space and nearly coincident in time (within 30 min). The emphasis of the paper is on determining whether the new retrievals of AOD (Collection 5) represent an improvement over the previous algorithms and calibrations (Collection 4). Visible (466 - 855 nm) and near-infrared (1243 - 2119 nm) comparisons are discussed separately. The results are that the new results compare less well to AATS for visible wavelengths on both satellites and for near-infrared wavelengths on Terra, but Aqua infrared comparisons to AATS improved

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with Collection 5. Angstrom coefficients based on two wavelengths (553 and 855 nm) are worse for MODIS-Terra and better for MODIS-Aqua, but still not very good compared to AATS as shown in Figs. 7(a) and (c). The analysis in this paper of fine mode fraction (FMF) derived from MODIS data and submicron mode fraction (SMF) derived from AATS suggests that the differences in satellite and AATS calculations remain significant. This reviewer finds the paper interesting and acceptable after the authors consider a few changes.

An additional reference to the aerosol uncertainty issues raised by Schwartz (2004) is McComiskey, A., S. E. Schwartz, B. Schmid, H. Guan, E. R. Lewis, P. Ricchiazzi, and J. A. Ogren (2008), Direct aerosol forcing: Calculation from observables and sensitivities to inputs, *J. Geophys. Res.*, 113, D09202, doi:10.1029/2007JD009170.

In the Introduction the suggestion that fine mode fraction is an indicator of anthropogenic aerosols, while not coming from the authors, but apparently accepted by them, is troubling as this suggests that fine mode aerosols produced in nature are negligible compared to man-caused aerosols; in my opinion this hypothesis is difficult to defend.

Explain the notation $\pm 0.03 \pm 0.05 \text{AOD}$.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 9, 11753, 2009.

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