

## ***Interactive comment on “The T1-T2 study: evolution of aerosol properties downwind of Mexico City” by J. C. Doran et al.***

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### **1 General Comments**

This paper is well organized and well written. The authors did a nice job of describing the study and the instrument details, which was followed by a pleasant analysis of the results. This paper is acceptable as written, in my view. I provide a couple of comments below that the authors may address, if they choose.

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## 2 Specific Comments

If aerosol mass concentration is available at both the T1 and T2 sites, it might be interesting to plot the specific absorption as a function of EC mass fraction. Specific absorption is not sensitive to the mass fraction of EC that is externally mixed with other aerosols, but specific absorption is sensitive to the mass fraction of EC that is internally mixed with other aerosols (see Figures 1 and 3 in Schuster et al., JGR, 2005; Petzold et al., Atmos. Environ, 1997; Neusub et al., JGR, 107, 8031, doi:10.1029/2001JD000327); hence, plotting the data in this way may be illuminating. It would also be interesting to see if the EC aerosol fraction decreases as the air mass travels from T1 to T2 during the transport periods, and how the changes in EC aerosol fraction play a role in increasing the EC specific absorption.

On page 12980, the authors extrapolate the specific absorption at 870 nm to 550 nm using a  $\lambda^{-1}$  dependence. On the next page, they point out the drawbacks of this approach, and mention that their PSAP measurements did not always indicate a  $\lambda^{-1}$  dependence for absorption. My question is — since PSAP measurements are available at multiple wavelengths, why not use them for the spectral extrapolation of absorption? The empirical  $\lambda^{-1}$  relationship for aerosol absorption is not applicable for all aerosol sizes, after all. . . if you have the data, why not use it?

## 3 Technical Comments

I would locate the “median” columns of Table 1 in-between the 10th and 90th percentile columns (that’s more intuitive for me, personally).

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Interactive comment on Atmos. Chem. Phys. Discuss., 6, 12967, 2006.

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