Reply to Anonymous Referee #2

We thank the reviewer for the careful reading of the manuscript and helpful comments. We have revised the manuscript following the suggestion, as described below.

(1) The authors have balanced their presentation and combined some nice detailed aerosol modeling with the MILAGRO campaign data and then included it in photolysis calculations.

Notation is clear and readily followed.

Since the authors are experts in radiative transfer from their previous work, it would have been useful to comment on the errors made by using just the asymmetry factor (typical of two-stream calculations which are known to be bad at morning/afternoon sun angles for the scattered light) rather than the full scattering function. But, this may be beyond the current ms.

We have added discussions in Section 4: "*It should be noted that when calculating the photolysis rates in the FTUV, the two-stream approximation is used to solve the radiative transfer equation to obtain the actinic flux. The two-stream method divides the multiple scattering contributions into two components, representing by the asymmetry factor (g), and upward and downward fluxes are calculated by solving two coupled differential equations. Generally, in radiative transfer calculations, the more streams that are adopted in the radiation scheme, the more accurate is the calculated radiation field. Therefore, in the two-stream method, errors are caused by using just the asymmetry factor rather than the full scattering function or very low angular resolution. Kay et al. (2001) found that the two-stream approximation had considerable errors at the cloud base and top, whereas the δ-four stream approximation had negligible errors. More accurate methods to calculate actinic flux need to be considered in the future study, but are beyond the scope of the present study.*"

(2) Minor - typo, missing parenthesis for Dickerson et al. (1997). - Fig captions may need some additional words to describe the curves and what is shown. I had trouble with Fig 9, for example, but that could be me.

We have corrected Dickerson et al. (1997) in Section 1.
We have added additional words in Figure captions (Fig. 9 and 12).

Figure 9. Daily cycle of the percentage change of $J[O_3(^1D)]$ and $J[NO_2]$ averaged over RAMA sites and during the period from March 24 to 29, 2006 when the aerosol effect on the photolysis frequencies is considered.

Figure 12. Daily cycle of the percentage change of aerosol absorbance at (a) 550 nm and (b) 400 nm averaged over RAMA sites and during the period from March 24 to 29, 2006 when the aerosol effect on the photolysis frequencies is considered; (c) Percentage change of

$J[O_3(^1D)]$, $J[NO_2]$, O_3, OH, SOA, and nitrate due to aerosols averaged over RAMA sites and during the period from March 24 to 29, 2006. Black: without the rapid aging of BC and enhanced UV-radiation absorption by POA; red, without the rapid aging of BC; green: without the enhanced UV-radiation absorption by POA; blue: the base case.