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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Emission and chemistry of organic carbon in the gas and aerosol phase at a sub-urban site near Mexico City in March 2006 during the MILAGRO study" *by* J. A. de Gouw et al.

Anonymous Referee #2

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This manuscript presents observations of VOCs, EC/OC, WSOC, and OM at T1, a suburban site during the MILAGRO 2006 campaign. The emission ratios of most hydrocarbons relative to CO were found higher in Mexico City than in the United States. Diurnal variations of the secondary oxygenated species showed strong photochemical processing in the afternoon. Daily enhancement ratio of TOOC relative to CO was conserved with its composition, shifting to more oxidized form in the afternoon. Local biomass burning sources were found not to contribute significantly to the enhancement of most gas and particulate species. The data presented in the manuscript are original and within the scope of the ACP. The manuscript should be published after addressing the following comments.

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Interactive Discussion
Discussion Paper

1) No meteorological information during the observation period at the T1 site was provided in the manuscript. This reviewer believes that it is important and necessary to provide such discussions. Fast et al. (2007) characterized the overall meteorological conditions during the MILAGRO 2006 campaign into three regimes. Did the local chemistry at the T1 site show any influence from weather conditions within each period? 2) The authors focused on the emissions and chemistry of organic carbon in both gas and aerosol phases at a local scale (T1 site). However, one of the objectives of the MILAGRO campaign was to investigate the local and global impact of plumes originated from Mexico City. Thus, a series of ground sites were set up along the proposed transport route including T1, a downwind site from urban Mexico City. Had the authors considered the possibility that the afternoon observations at T1 were mainly aged city plumes instead of the locally processed emissions? 3) According to the calculation based on Equation 3, the authors concluded that in the mid afternoon 25% of the sampled air consisted of local non-processed emissions and 75% consisted of processed emissions that were released early in the day. Because this work was not based on quasi-Lagrange sampling of the air parcel, a more proper interpretation of this calculation should be that the air sample emitted in the early morning would be processed by OH oxidation to the extent of 75% after travelling downwind from the T1 site for 8 hr. 4) Biomass burning events could be identified visually during the MILARO 2006 campaign. However, the authors found no significant influence from these sources at a suburban site. Could that be explained, at least partially, by the local meteorological conditions?

References: Fast, J. D., de Foy, B., Acevedo Rosas, F., Caetano, E., Carmichael, G., Emmons, L., McKenna, D., Mena, M., Skamarock, W., Tie, X., Coulter, R. L., Barnard, J. C., Wiedinmyer, C., and Madronich, S.: A meteorological overview of the MILAGRO field campaigns, Atmos. Chem. Phys., 7, 2233-2257, 2007.

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Interactive Comment