

***Interactive comment on* “Measurements of volatile organic compounds using proton transfer reaction – mass spectrometry during the MILAGRO 2006 Campaign” by E. C. Fortner et al.**

Anonymous Referee #1

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The manuscript by Fortner et al. describes ground based VOC measurements using PTRMS in Mexico City during the MILAGRO 2006 field campaign. By improving the understanding of VOC sources in the Mexico City Metropolitan Area it could provide a valuable contribution to this special issue. The following comments however will need to be addressed in detail:

Page 11822, Line 20: Abstract: How can a spatial pattern be determined at a fixed ground site? The manuscript does not present any data from other parts in the city as suggested in the Abstract.

Page 11823, Line 14, Introduction: Which emission inventory was used? More detail

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is needed.

Page 11824: Experimental Methods: Was the same PTR-MS instrument deployed?

Page 11831, Line 4: Isoprene: Why are only biogenic sources considered? Wouldn't the diurnal cycle suggest other / additional sources of isoprene? What is the contribution from traffic? If isoprene was emitted from plants in a light dependent fashion, why is it observed at night and why does the peak shown in Figure 3 coincide with the rush hour?

Page 11835, line 5: Ethyl Acetate: Why ethyl acetate (C₄H₈O₂) and not any other compound (e.g. C₅H₁₂O compound) ? I would argue that the evidence presented by the authors is necessary but not sufficient at this point. Is there any other indication to assign ethyl acetate to this PTRMS mass channel? (e.g. from gc measurements or from the isotopic ratio). Is this compound reported in the Mexican emission inventory? Ethyl acetate is reported for industrial regions in the US (e.g. the Houston Ship Channel), but no reference is given whether it has actually been observed during previous US field studies, where PTRMS instruments have been deployed (e.g. TEXAQS2000/2006).

Page 11824, line 14: Has there been an intercomparison between PTR-MS and whole air sample data? Why is a comparison between complementary VOC datasets not included here?

Page 11838, from line 6 on: Diurnal patterns of toluene and ethyl acetate (as many other VOCs) can mainly be driven by planetary boundary layer dynamics. Assuming constant emissions throughout the day a similar diurnal pattern would be expected. The conclusion of significant industrial emissions at night time can therefore not be inferred from such a qualitative argument. Distinct VOC plumes observed at night are expected due to the stable structure of the nocturnal PBL. From the presented data and limited amount of analysis the authors can only conclude that industrial emissions also occur at night.

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Figure 6a: It is not clear how the authors can exclusively assign a morning hour traffic plume to benzene and toluene, when toluene/benzene ratios up to 60 are observed. Typical traffic ratios for MCMA have been reported to be in the order of 2-3. It appears that a significant amount of industrial (or other) emissions are mixed in for most of the data shown in Figure 6a. The figure needs to be described in a more consistent fashion. (e.g. what is the actual rush hour peak in figure 6a that the authors refer to?)

Minor comments: Page 11834, line 22: This should probably mean 'rush' hour.

X- and Y-axis labels in Figures 1-4 are hard to read. Bigger fonts should be used.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 11821, 2008.

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