

***Interactive comment on “Observations of glyoxal and formaldehyde as metrics for the anthropogenic impact on rural photochemistry” by J. P. DiGangi et al.***

**Anonymous Referee #1**

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General:

I found the science interpretation of the CHOCHO/HCHO data thin and insubstantial. It was limited to a handful of case studies from which we learnt very little about how we could use the ratio of CHOCHO and HCHO as an effective metric. The section about satellite data was largely unsubstantiated, and the final section provided minimal numerical calculations to support the arguments put forward.

Specifics:

1) Figures S1 and S2 should be in color.

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2) Page 6056, Line 21: reasons for the differences are unclear? Are there really no clues from the wider science efforts in both campaigns?

3) Page 6057, Lines 1-8. Very vague text. Days in the NE regime were more likely to include transport events? Can the authors provide more information about the meteorology during the campaign?

4) Page 6057. Suggest the authors replace Figure 2 with Figure S5.

5) Page 6058. To be more precise, CO is a tracer of incomplete combustion.

6) Page 6058, Lines 1-10. RGF goes up with biomass burning. Explain the significance beyond the numerator becoming larger than the denominator.

7) Page 6058, Line 11-17. Here, the authors note that the ratio RGF is greater for the first MFI than the second event. Aside from 2 outliers at 19-20 LT on the first day the elevated values are pretty much the same. Besides even a small change in plume age will lead to large changes in HCHO and CHOCHO. It would be useful for this reader to provide an indication of the oak trees on the maps provided in the supplementary information.

8) Page 6059, Line 1. ??? A influences B but not always noticeably?! Contrasting two events on successive days without a more detailed analysis of the emissions, chemistry or the transport is of limited worth. Differences could be simply due to the flaming/smoldering phase of the fire.

9) Page 6059, Line 23: Tell the reader about OH measurements.

10) Page 6062, Line 10 onwards. The sharp variations in benzene are also observed in the acetonitrile but on a smaller scale.

11) Page 6063, Line 3. This statement is not supported by the data analysis shown in the paper.

12) Section 4.1. Very thin analysis. How about plotting timeseries of HCHO and CHO-

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CHO from satellites and surface data?

13) Section 4.2. Again, thin analysis.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 6049, 2012.

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