

## ***Interactive comment on “Methanol-CO correlations in Mexico City pollution outflow from aircraft and satellite during MILAGRO” by Y. Xiao et al.***

### **Anonymous Referee #2**

Received and published: 19 April 2012

#### General Comments:

The authors compare determinations of methanol (CH<sub>3</sub>OH) and carbon monoxide (CO) retrieved from the Tropospheric Emission Spectrometer (TES), with observations of CH<sub>3</sub>OH and CO made in the outflow of Mexico City during the 2006 Milagro Campaign. The paper argues that the ratio of CH<sub>3</sub>OH/CO can be used as an indicator of the sources, and source strengths of CH<sub>3</sub>OH. The authors state that satellite observations can provide unique perspective where in situ measurements are lacking. The ideas proposed in the paper are interesting and if determined would be of value to the community, however issues with the TES determinations of CO and CH<sub>3</sub>OH over high

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surface elevation sites (such as that studied here) seriously compromise the validity of the conclusions. While this study is of value, it should not be published until the issues with the retrieval over high surface elevation sites are resolved. As a result, I recommend the paper be rejected, and resubmitted when the TES retrievals in these complex regions can be validated.

## Specific Comments:

P5706, L15: What do the ranges represent? Is this simply the min-max? Why was this not reported as a mean $\pm$ stdev as in all other references cited? What is the uncertainty associated with these ranges?

P5707, L15: What are the sink specific lifetimes? Which process is more important?

P5706, L28: Given all of the previous work on this topic (cited above), what specific new insight is this paper bringing? How exactly will it reduce the uncertainty in the source strengths, seasonality (was this discussed), spatial distribution?

P5708, L15: Is there a reference for the validation of the CO or CH<sub>3</sub>OH product with ambient measurements?

P5709, L17: What is the ratio of CH<sub>3</sub>OH/CO for various other aircraft studies?

P5711, L10: The data should only be used on averaging times greater than the sampling time of the instrument with the longest time resolution (2.8min).

P5715, L18: "TES does not resolve the CO pollution over the Mexico City Basin" This is a major problem. Figure 4c, provides the reader with zero confidence that the TES determinations in this region are meaningful. The concentration values are well over a factor of 2 different from the observations and the lack of any spatial differences in CO in the outflow of Mexico City make this analysis impossible to conduct. Until these issues are resolved this paper should not be published.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 5705, 2012.

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