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Atmospheric Chemistry and Physics Discussions

Interactive comment on "First global distributions of methanol and formic acid retrieved from the IASI/MetOp thermal infrared sounder" *by* A. Razavi et al.

Anonymous Referee #3

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Overall assessment.

This paper provides a first 1-year global data set of methanol and formic acid columns from the IASI instrument. It is an important contribution to atmospheric chemistry that will help to better constrain the atmospheric budgets of these two species. I recommend publication after consideration by the authors of the specific comments below. Although the paper is overall well written and of high scholarly quality, there are a number of simple grammatical mistakes in the text that I did not itemize here but that the authors can pick up with a careful read. Also the labels on several of the figures need to be enlarged.

Specific comments:

1. Page 21476, line 3: the second sentence of the abstract is misleading (cf. comment 2), unnecessary, and does not stem from the work presented here. I suggest cutting.

2. Page 21478, line 27: The effect of methanol on OH is only a few % (cf. Tie et al. cited in text). I wouldn't call it "significant", perhaps "minor" instead.

3. Page 21479, line 19: I am not familiar with this post-sunset "boundary layer squeeze" effect in the methanol data. If it is indeed a common feature then I stand corrected but surprised - the biogenic methanol source is thought to shut down at dark.

4. Page 21485, line 8 and Figure 2: it's not clear to me what these covariance matrices actually represent.

5. Page 21489, line 7: would the higher surface T from fire also cause some error in the retrieval method?

6. Page 21490, line 5: To what extent can the error in the methanol retrieval be considered random vs. systematic, i.e., reducible through a large number of observations? Same question for formic acid.

7. Page 21493, line 6: anthropogenic sources of formic acid would be presumably aseasonal and this is not apparent either over the eastern US or eastern China. In the case of the eastern US, the seasonality suggests a biogenic source. In the case of eastern China, the seasonality suggests a source from burning of agricultural waste (see Fu et al. 2007, cited in paper, who find the same enhancement for HCHO).

8. Page 21493, line 14: I'm not getting anything from this whole Correlations section. The correlations could simply reflect similar but independent spatial distributions. I suggest reserving this section for a future paper comparing model to observations, where the observed correlations would provide a useful test of the model.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 21475, 2010.