**Atmospheric
Chemistry
and Physics**
Discussions

Interactive comment on "Trace gas emissions
from combustion of peat, crop residue, biofuels,
grasses, and other fuels: configuration and FTIR
component of the fourth Fire Lab at Missoula
Experiment (FLAME-4)" *by* C. E. Stockwell et al.

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Very informative and useful paper that will become a reference piece of work for many studies I imagine. Some relatively minor suggestions for additions/amendments below:

- Why is N_2O not mentioned, was its detection attempted but it found to be present undetectable quantities? If so, can a minimum EF be put on its production from the various fuels burned herein?

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- Some information of the spectral fitting window, additional species included in the fit for each major target gas, and any other parameters would be useful for others wanting to replicate all or part of your methodology. Perhaps in the Supplementary Materials ? If you used a set of parameters taken from elsewhere then at least a reference to that work.

- Section 2.6 is very interesting, so much so that some parts could be presented in more detail. The prior section on derivation of EF and MCE goes into a lot of detail about these topics, which are presented in many other papers, so Section 2.6 (which is reporting not so commonly available material) should I think be covered in more detail than it is ideally. For example expanding on the "a simple ïňĄeld/lab correction factor can be used when warranted" - what is this correction factor? Whilst I agree that MCE is measured in many field fires, it is not always measured at the same location (e.g. sometimes on the ground and sometimes in the air; which may represent different types of smoke to some extent). Perhaps this needs a brief mention as well.

- Figure 4 shows very good agreement between these lab results and various field data, very encouraging indeed.

- Section 3.1. When you say "average MCE" perhaps better to say "mean MCE" if the mean was the statistic used. Also, this approach will only presumably work if the relationship between MCE and EF of the compound is linear, which it is in these cases. Are non-linear relationships ever found with the lab data....or a relationship so poor that it is not possible to use it to derive the EF at the typical MCE measured in the field? Also, on the linear fits of Figure 5 it would be useful to put the uncertainties on the slope and propagate them into the uncertainty of the derived EFs?

- With the tropical peat, no in situ MCE measurements are available. I presume you therefore present the results from the lab without recourse to the "plot based analysis" of EF vs MCE [e.g. Fig 5] as done with the other samples? Making it very clear when they are first reported as to which fuels the "plot based analysis" was conducted

for, and which fuels the lab-based EFs are reported as is would be helpful. This is mentioned in the Conclusions section though.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 10061, 2014.

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