

Interactive comment on “Coupling field and laboratory measurements to estimate the emission factors of identified and unidentified trace gases for prescribed fires” by R. J. Yokelson et al.

Anonymous Referee #1

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In this paper, the authors perform a thorough analysis of previously published emission data from laboratory and field fires to derive an internally consistent set of emission factors for a very large number of gaseous and particulate smoke components. The results can be expected to provide a substantially better data base for emissions from prescribed burning, and should be very useful for air quality modeling. Of great interest is the fact that emission estimates for a large number of unidentified, but potentially important substances, which showed up in the mass spectra, are included. I recommend publication with just a few minor revisions.

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Specific comments and technical corrections:

page 21529, line 10ff: The airborne PM_{2.5} measurements used an indirect technique (measurement of the scattering coefficient). I would like to see a quantitative assessment of the errors and uncertainties that arise from this technique. If this is detailed in the reference given (Burling et al., 2011), at least a brief summary would be desirable.

page 21541, line 4ff: There appears to be a discrepancy between what is said in the text and what is actually in Table 1. The text states that two techniques of converting lab to field EF are given in the table. But the table actually shows the lab data, the results of the MCE method of transformation, and the ratio of the lab/field averages. This is quite confusing to the reader.

page 21546, line 6ff: The authors state that the present emission estimates and those by Akagi et al are much larger than “widely used previous estimates”. It would be of interest to know what these estimates are and have the references stated. Koppmann et al. (2005) and Andreae and Merlet (2001) come to mind.

page 21547, line 15ff: The EC/TC ratios seem indeed high. Given that there are numerous publications that show the possibility of huge errors in EC measurements in biomass smoke aerosol (as much as a factor of ten!), a thorough discussion of the potential measurement bias is required.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 21517, 2012.

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