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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Exceptional emissions of NH_3 *and HCOOH in the 2010 Russian wildfires" by Y. R' Honiet al.*

Anonymous Referee #1

Received and published: 31 January 2013

This paper presents an emission study of the 2010 Russian fires using data from the IASI satellite instrument. The results complements the previous results from Yurganov 2011 and Fokeeva 2011 by comparing total emissions of carbon monoxide, but includes estimates made for ammonia and formic acid. The methodology employs total columns derived from IASI, the calculation of their daily enhancement ratios, total mass and burdens over a specific area and finally they use a simple box model to obtain the emissions. Although this clever approach depends on a fairly good knowledge of the lifetimes of these two short-lived species, a modestly but valuable large range is obtained for their total emission during this extraordinary event. The paper should be published after the concerns of Referee #2 are clarified and the following considerations and corrections are made:

Fig 2 (y-axis) presents the total columns of all 3 gases in molec cm-1, but no explanation is given why the authors choose to write an "X" before the label TC-max and

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TC-mean. Explain or correct.

Large fires have repeatedly occurred in the past, but might have not been measured in such detail as remote sensing techniques have not been available for such a long time. A reference to "typical background values" is made in the abstract (l7) and (p31565 l19), does this refer to values outside the plume or to other times or years observed within the same region and with the same instrument? Please specify.

p31565 l16. Fig 2b does not present emissions but rather total columns, please correct. Where are the highest values on 2, 10 and 15 August to be seen?

p31563 l9, cite previous articles where "large spatial and temporal" studies of NH3 and HCOOH have been performed (Lieven 2009, Grutter 2010)

p31563 l16 or Sec 5. Include a very brief description of what the BTD calculation consists of.

p31564 l23, should say "The issues. . ."

p 31565 l8, should say "extending from .. and .. "

p31566 l4, cite and compare qualitatively with the seasonal evolution observed by MIPAS in the UT.

p31567 l9. Can background or urban CO contribute to what is seen here? Was it removed from the linear regression to avoid the offset?

p31570 l10, "possibly coupled"? .. the authors should know.

p31570 l16. Specify if the adjustments are made with averaging kernels or something else.

p31572 l12. Please clarify if the enhancement ratios are not affected by the errors in the total columns. Would the uncertainty in TC propagate all the way to the emission calculation? Please be clear.

ACPD
12, C12168–C12170, 2013

References:

Lieven et al., “Global ammonia distribution derived from infrared satellite observations,” Nature Geoscience, 2009. 2: 479-83

Grutter et al. "Global distribution and variability of formic acid as observed by MIPAS-ENVISAT. J. Geophys. Res. 115, D10303 (2010)

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 31561, 2012.