

Interactive comment on “Nine years of global hydrocarbon emissions based on source inversion of OMI formaldehyde observations” by Maite Bauwens et al.

Anonymous Referee #2

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Bauwens et al. present an analysis of nine years of global hydrocarbon emissions inferred from OMI formaldehyde observations. 2005-2013 global distributions of pyrogenic and biogenic VOC fluxes are derived from OMI HCHO columns and the adjoint inversion scheme based on the IMAGESv2 global CTM. The distributions, their interannual and seasonal variations are discussed for the different regions where the changes are the most important compared to the a priori emissions. The inversed emission fluxes are compared and discussed according to the various independent inventories. Trends over the studied period are derived and discussed.

The paper is well written and structured with detailed discussions of the major changes compared to the a priori in terms of distribution, seasonality and interannual variability.

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ity. Trends are also well documented and discussed. This work is suitable for ACP publication and I recommend it after the following specific comments are addressed.

Specific comments:

- Page 5, lines 25-26: it should be interesting to give a range of retrieval errors to see how it compares to the representativity error.
- Page 5, lines 26-27: On which studies, references the a priori error estimate of biogenic and pyrogenic fluxes is based? Please, discuss this point.
- Page 6, lines 1-3: Some of the regions are not covered by the observations depending the season. How does this impact on the retrieved fluxes? Is the induced uncertainty can be estimated?
- Pages 7-8 – discussion of Figure 4: Europe presents a large interannual variability, which is not discussed in this section. Please, add some explanations here or mention it and refer to the corresponding section (section 8) if suitable.
- Page 9, lines 27-28: it is not clear how agricultural fires can be maximum in December while they are dominant for other periods of the year. Could you make it clearer, please?
- Figure 1: it would help to provide difference plots

Technical comments:

- Page 5, lines 13-15: the sentence is too long and should be rephrased for clarity.
- Page 10, line 28: remove “in Northern Africa” after “the isoprene fluxes”.
- Page 16, line 27: there are two “and” close to the end of the line. Remove one.

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