

Interactive
Comment

Interactive comment on “A very high-resolution global fossil fuel CO₂ emission inventory derived using a point source database and satellite observations of nighttime lights, 1980–2007” by T. Oda and S. Maksyutov

Anonymous Referee #1

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The two authors have merged a series of databases to design a multi-year global fossil fuel inventory. The study builds on a recent paper by Rayner et al. (2010) who exploited satellite observations of nighttime lights as a proxy for emission location and intensity. Improvements are brought to the method, which is confirmed by a comparison with the detailed Vulcan inventory over the USA. The text is both rich and well-written. The main limitation of the study is the lack of quantitative error assessment, in contrast to the Rayner et al. study. Some suggestions to remedy this gap are given here in the detailed comments. The other limitations relate to some poor assumptions of the

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method (no temporal variability of the point source relative intensities or of the nighttime lights), but they are discussed in a fair way.

Detailed comments

- p. 16307: the title is misleading. It omits the BP statistics that are a key component of the inventory. Further it should be made clear that the high resolution refers to space and not time.
- p. 16308, l.5: please insert 'natural' behind 'regional'
- p. 16308, l.7: please insert 'annual' before 'fossil'
- p. 16308, l.20-21: one wonders how a inventory for yrs 1980-2007 helps processing an instrument that has been launched in 2009. The mention of GOSAT here is an anecdote and actually restricts the prospect of the inventory. It should be better removed.
- p.16308, l.26: analysis of what?
- p. 16309, l.13: why 'diagnostic'?
- p. 16309, l.24: please insert 'a priori' before 'knowledge'
- p. 16312, l.1: see the above comment about GOSAT.
- p. 16314, l.22: why has this range of years been chosen? Why not a shorter or a longer period?
- p. 16315, l.14: this is a very poor assumption for a 17-year period.

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- p. 16320, l.5-15: I do not understand the meaning of these sentences. Please rephrase. Section 3.3: the section lacks numbers to characterize the various uncertainties. For instance, the authors could use the CARMA data for 2000 to assess the impact of the use of the 2007 data for the whole 28-yr period. Further, the authors could exploit the comparison between their inventory and Vulcan to estimate the biases and standard deviations of their inventory for the US as a function of spatial resolution. Compared to the results presented in Table 3, the scaling should be removed for such exercise.
- Tables and Figures: some of the numbers are given in MtCO₂/yr and MtC/yr. Please make a choice.
- Table 3: the definition of 'diff' should be more precise here.
- Figure 2: the bars of the geographical regions (bottom right) do not seem to have the same scale than the rest. Please check.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 16307, 2010.

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