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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Isoprene emissions modelling for West Africa using MEGAN" *by* J. Ferreira et al.

Anonymous Referee #1

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"Isoprene emissions modelling for West Africa using MEGAN", by Ferreira et al.

This manuscript provides a comparison between simulation results and observations of isoprene from West Africa. A set of simulations of isoprene emissions was performed with the MEGAN model, applying different sets of meteorological input data. Simulations at a high spatial resolution were compared with isoprene mixing ratios from aircraft measurements.

The manuscript is well written and presents its study in a clear and concise manner. The topic fits the scope of Atmospheric Chemistry and Physics, and I suggest accepting the paper once a number of comments have been taken into account (see below, numbers refer to page/line number).

Major comments:

- 6929/12: Please provide a description of the setup of the WRF simulation performed to force the model with (as is done with the MM5 model later in the paper). The paper that is referred to (Flaounas et al., 2010) is not yet published.

- One of the recurring issues in the paper is the EF and the mismatch between the vegetation present and the EF in the data set. Do the authors know what PFT/type of vegetation the EF around 15-16N is based on? What could be the cause of this mismatch in the data set?

- 6931: The comparison between simulated emissions on the one hand and observed mixing ratios on the other needs to be done with caution, as is acknowledged by the authors. Whereas transport is probably indeed not very important with the short lifetime of isoprene, the reaction rate probably is, and changes in temperature and light could potentially affect the lifetime of isoprene in the atmosphere (and thereby the mixing ratios). How would this affect the outcome of the comparison?

- 6932: Spatial and temporal resolution of the applied WRF simulation are used as an argument to use MM5 instead for the high-resolution simulations. However, WRF could be applied in the same finer resolution as well, and the change performed here is not only a change of resolution, but a change of model as well. Why did the authors use MM5 instead of WRF to obtain a higher resolution?

- The high-resolution simulations for the time of the aircraft measurements (section 5) show clearly a cloud cover pattern in the radiation data (Fig. 9), that varies in time. How well is the cloud cover represented in MM5? Is this a major uncertainty for the comparison between simulated and observed data? It would be nice to have simulated (temperature and) downward SW radiation along the flight track represented in Fig. 10 as well (e.g. for different times, as done with the simulated emissions in the second panel) to compare these with the observed values in panels 3 and 4.

Minor comments:

- 6925/27: The sentence starting with "Thus the West African ..." is unclear, please rephrase

- 6928/19: The description of MEGAN (Guenther et al., 2006) describes six PFTs. Are croplands ignored in this study?

- 6930/25: Please rephrase the part of the sentence on "a detailed multilayer 5 canopy environment model". Is it 5 layers?

- The figures and figure captions would be easier to read if different panels (and the descriptions in the captions accordingly) were numbered a, b, c, etc.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 6923, 2010.