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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Sensitivity of isoprene emission estimates to the time resolution of input climate data" *by* K. Ashworth et al.

**Anonymous Referee #2**

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The manuscript by Ashworth et al. describes a set of simulations of isoprene emissions in which the temporal resolution of the (meteorological) input data was varied. Simulations were performed with the MEGAN model, applying a standard set of vegetation input data, but varying the averaging in the climate input data they use.

The authors study a well-defined problem and follow a clear structure in their manuscript. The results and conclusions have a clear application in future incorporations of the MEGAN model (or comparable algorithms) within Earth system models. The manuscript is concise and clearly written, and I would recommend publication of this manuscript once the minor comments below have been taken into account.

- Various ways of averaging the input data are shown to cause a decrease in total emissions, caused by the nonlinear behaviour of the emissions. It might add to the un-

derstanding if the authors would be able to provide insight in when in the diurnal cycle the decrease is taken place: is it equally distributed over the day, or is it predominantly around (local) noon? If this information is easy to extract from their results, I would recommend to analyse this and add the information to the manuscript.

- The applied diurnal cycle is described as "a sinusoidal function", but its description remains a bit unclear. I presume it applies daily minimum and maximum temperature to give the amplitude, but is it a "pure" sinusoidal, or is there any correction accounting for e.g. changes in daylength? And given the deviation shown for the Amazon (fig. 2, middle right), how good is this applied diurnal cycle? Could you suggest improvements to the algorithm for those cases where hourly data are not available? See e.g. Reicosky et al., 1989, Agricultural and Forest Meteorology, 46, 193-209.

- Table 1 provides a convenient overview of the set of simulations performed, and I would recommend to refer to the numbers in there more often to avoid confusion, e.g. in the figure caption of Figure 1.

- Figure 1: The values mentioned as total global average below the figures (-7%, -3%) seem to be very unlikely given the spatial distributions. Please check whether the numbers and the spatial distributions match. Also, the colour scale of the upper figure could be improved to show more contrast.

- Figure 2: I was a bit confused about the two upper panels. It is mentioned to show emissions "in comparison with...", but I am not sure whether the two figures show different runs. Is the top right figure a detail of the top left, or do the two figures show two different runs? Please phrase the figure caption more clearly. Apart from that, it is not clear to me what the lower left panel is showing: It mentions Run 1, but is the comparison not made relative to Run 1?

- Please rephrase one of the three sentences starting with "Table 1 shows ..." on page 23553 to smoothen the text



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Interactive Comment



Interactive comment on Atmos. Chem. Phys. Discuss., 9, 23547, 2009.



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