Atmospheric
Chemistry
and Physics
Discussions

Interactive comment on "Effects of two different biogenic emission models on modelled ozone and aerosol concentrations in Europe" *by* Jianhui Jiang et al.

Anonymous Referee #1

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Jiang et al. describe a modeling study comparing two biogenic VOC emission models, MEGAN and PSI, and their effects on modeled ozone and aerosols in Europe using a chemical transport model CAMx. The two BVOC models mainly differ in vegetation classification and reference basal emission rates. PSI predicts much lower isoprene emission but 3 times of monoterpene emissions higher than MEGAN. Such emission differences result in relatively small differences in ozone (<10%) but very large differences in SOA.

The manuscript is well structured and generally clearly stated. The study focuses on the impact of different BVOC inputs which is one of the fundamentals of atmospheric

chemistry. I recommend publication of this manuscript in ACP after minor revisions.

My major concern is that the two BVOC models predict very different patterns and magnitude of isoprene and monoterpene emissions, but readers have no idea about how good they are compared to real observations. I suggest to add a section comparing the PSI and MEGAN results with at least some in-situ measurement of isoprene and monoterpene emissions. Validation of only ozone and SOA are not enough to fully understand the strengths and weaknesses of the two models, as many other factors may contribute to the formation of ozone and SOA and they may compensate each other.

Other comments: P6 L1: Are those factors including soil moisture and CO2 dependence "turned on" in your simulations?

Figure 2: Font of legends should be consistent.

Figure 3: How to interpret different MT peak time in MEGAN and PSI (in summer, bottom panel), even though they adopt a similar T-dependent function and use the same meteorology input?

P8 L23-25: Better to give some rough numbers of these model-observation comparisons from these references.

P9 L14: The statement "the spatial difference in simulated O3 and isoprene emissions" is not clear. What variables are used here to calculate the correlation?

P9 L26-28: Can you provide more information on NOx and ozone background concentration? Is the whole European domain within the NOx-sensitive regime?

P10 L9-12: Can you add two lines/shades to represent primary and biomass burning OA in Figure 7? It would be more straightforward to see the contributions of biogenic versus other sources.

P11 L27: "vertical distribution of elevated emissions" should be "vertical ventilation"?

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