

Atmos. Chem. Phys. Discuss., referee comment RC1  
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## Comment on acp-2021-675

Anonymous Referee #1

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Referee comment on "Enhanced summertime ozone and SOA from biogenic volatile organic compound (BVOC) emissions due to vegetation biomass variability during 1981–2018 in China" by Jing Cao et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-675-RC1>, 2021

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The manuscript tried to estimate the impacts of BVOC emissions on ozone and SOA during 1981–2018 using modelling method. The topic long term variation of background ozone and SOA is interesting, but there are still some problems need to be further clarified in this manuscript.

- Model evaluation should be added. The authors should show evidences to make the results convincing, especially the BVOC emissions.
- The manuscript focused on the change of background ozone and SOA in China due to the change of vegetation. The MS should show the change of biomass as well as how the biomass changes affecting BVOC emissions.
- The history simulation setting is not reasonable by fixing the meteorology in 2008 (as listed in Table 1). Why 2008 was chosen in this study? The BVOC emissions are very sensitive to meteorology change, and the meteorology is an important factor influencing the emission and air quality. Fixing the meteorology may induce the unreasonable results which should be discussed in the MS. Many factors influencing the BVOC emissions and their atmospheric chemistry in the past 4 decades. A method should be set to clarify the multivariate effects.
- The logic is weak, and the text need to be re-organized. Each section in the results seems loose respectively, and the main line of the manuscript has not been highlighted. The topic is long term impacts variation, I think carry out the discussion in chronological order will be better. What's more, that disturbs the readers' thinking by posting the figure of spatial variations in BVOC emissions in Jun 2018 and explaining the emission situation in section 2.1.
- Overall the explanations are lack of mature and the scientific thinking is not

Also, I have some suggestions for the authors to revise the manuscript:

- Section 2.2: Using a table to list the model settings is better to list them in a paragraph
- Table 2: Don't branch the percentages of BVOC contribution
- The form of picture display should be strengthened