

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2020-1264

Anonymous Referee #1

Referee comment on "Indirect contributions of global fires to surface ozone through ozone-vegetation feedback" by Yadong Lei et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-1264-RC1>, 2021

Well written paper showing vegetation feedback of fire-enhanced O₃ based on modelling approaches. The results are supported by showing O₃ vegetation feedback with and without fire. I would recommend to slightly change the Introduction so that the reader would be able to follow the text more fluently and the paragraphs will follow each other more logically.

Here are some more detailed comments:

line 23: fire is not a source of ozone. Please rewrite it in a manner that it produces precursors of O₃. Moreover the sentence has double meaning - it is a fire and O₃, which causes damage to vegetation and reduces stomatal conductance.

line 70-71: here you write the same as in line 49-50

line 79: cite the three papers here

line 88-90: when the O₃ is enhanced, one would expect higher deposition velocity. Could you explain why in that case it is the opposite?

line 103-105: how do they influence the sources and sinks? I think they influence more sinks. Now it seems as if the reduction of LAI would be a source of O₃, when it is just reducing the sink of O₃. Moreover, there is a new review about O₃ effect on vegetation, which you might consider to include here. [10.3390/atmos12010082](https://doi.org/10.3390/atmos12010082)

line 203-204: is that true? One would expect oxidation of the compounds and sedimentation of particles before reaching BL

line 256-258: is the mean annual or is the mean from 2005-2012, which is longer time than annual.

line 381: I think you just hypothesize, that it is due to reduced stomatal conductance. There is no model feedback showing this nor your measurement.

Fig 6: explain abbreviations AMZ, CAF, SAS as in Fig. 3

