

We thank the reviewers for their constructive feedback that has helped us to improve the manuscript. Our responses to their comments are provided below, with reviewer comments in black, our responses in blue.

Reviewer 1

The authors have satisfactorily addressed most of our comments, adding clarity and detail to the manuscript. Two final, minor comments are listed below:

1. It is suggested that the methods section explicitly states that fire plumes were not isolated from urban influences in this analysis, in order to probe a range of background NO_x levels (as the authors explained in the Response to Reviewers).

Reply: We explicitly state this in the revised manuscript:

We did not explicitly isolate fire plumes from urban influence in order to examine aerosol effects across a range of background NO_x levels.

2. It is recommended that the manuscript includes a caveat about the absence of furanoid chemistry in the models. This statement would acknowledge that although they are not included in the GEOS-Chem and F0AM mechanisms, furanoid compounds are known to have an important influence on biomass burning plume chemistry (both at nighttime, as described in the Decker et al. paper that the authors correctly referenced in the Response to Reviewers, and in the daytime).

Reply: We explicitly state this in the revised manuscript:

It should be noted that although furanoid compounds markedly influence biomass burning plume chemistry under both daytime and nighttime conditions (Decker et al., 2019; Xu et al., 2021), their reactions are not represented in either the GEOS-Chem version or the MCM mechanism used in this study.