Atmos. Chem. Phys. Discuss.,
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Atmospheric Chemistry and Physics Discussions

Interactive comment on "On the sources and sinks of atmospheric VOCs: An integrated analysis of recent aircraft campaigns over North America" *by* Xin Chen et al.

Anonymous Referee #2

Received and published: 3 May 2019

This is an interesting and well-written paper that investigations VOC concentrations and reactivity in North America using an atmospheric model and a comprehensive analysis of aircraft observations from multiple field studies. The model skill in reproducing observed VOC concentrations and reactivity is good in the PBL and poor in the free troposphere. The subjects addressed in the manuscript are appropriate for ACP.

Photochemical reactions are the main sink for VOC. The authors could consider providing more information and critical evaluation of relevant factors that govern VOC removal rates, such as NOx emissions and O3 boundary conditions. The boundary conditions are from a global model and they have been accepted and used without much discus-

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Discussion paper

sion or evaluation in the present manuscript.

1. Are the ozone levels at the model boundaries and their seasonal variations reasonable and consistent with observational analyses by Parrish and Cooper at NOAA?

2. Please provide analogous maps for NOx emissions (anthropogenic, soil, lightning, pyrogenic) to match Figures 2a and 3a for VOC. While NOx is not the focus of the present paper, these emissions are relevant to the analysis as they have strong indirect effects on VOC lifetimes and reactivities.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2019-115, 2019.