Atmospheric Chemistry and Physics Discussions

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2021-1068

Anonymous Referee #1

Referee comment on "Satellite soil moisture data assimilation impacts on modeling weather variables and ozone in the southeastern US – Part 2: Sensitivity to dry-deposition parameterizations" by Min Huang et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-1068-RC1, 2022

The manuscript presents a comprehensive comparison of various vegetation relevant variables (e.g. soil moisture, GPP, surface air temperature) modeled with and without soil moisture assimilation. The main feat is the implementation of a data assimilation of soil moisture in two widely used land surface models NOAH-MP and CLM within WRF-chem. The manuscript continues to explore the effect of assimilated soil moisture on the ozone dry deposition. The authors compare the dynamic dry deposition schemes of the NOAH-MP and CLM (Bell-Berry type stomatal resistance) with the Wesley scheme of NOAH-MP (Javis-type stomatal resistance) and NOAH (Javis-type stomatal resistance). Ultimately, they extrapolate their resulting ozone surface concentrations from 2 weeks (Aug 16--28) to vegetation ozone damage risk indices MDA8 and AOT40. All studies are validated against observational data.

For the full review see supplement.

Please also note the supplement to this comment:
https://acp.copernicus.org/preprints/acp-2021-1068/acp-2021-1068-RC1-supplement.pdf