

Interactive comment on “Do we (need to) care about canopy radiation schemes in DGVMs? An evaluation and assessment study” by A. Loew et al.

A. Loew et al.

alexander.loew@zmaw.de

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Response to Reviewer 1

Authors did a pretty good job in comparing the effects of different radiative transfer schemes on forest canopy radiative forcing. However, I found the work done provides minimal insight on how these models will impact the performance of DGVM. As the authors points out, DGVM is used on the temporal scale of decades to millennia, while these models are implemented on a instantaneous basis. Not only is it unrealistic for DGVM to include 3-D radiative transfer models as the authors pointed out, nor is it realistic to account canopy radiative transfer at the temporal scale investigated in this

C7407

study using any of the radiative transfer schemes studies here. I believe the study is worthy of publication, but perhaps authors should conclude within what studied, not much about their effects on DGVM.

We thank the reviewer for the positive and constructive comments. As we have emphasized already in the paper it would be far beyond the scope of this study to quantify the impact of the differences in canopy RT schemes on DGVM simulations at timescales of centuries or millennia. This would require to implement different RT schemes in a model and then perform dedicated (coupled) simulation experiments.

The major contribution of this study is that it a) provides an assessment and comparison of canopy RT schemes as used in different DGVMs and b) quantifies potential impacts on surface energy and carbon fluxes in an idealized setup. Both is unique.

The results indicate that the deviations caused by the choice of the RT scheme is not negligible. We hope that this will motivate DGVM development groups to actually implement different RT schemes and perform the experiments the reviewer is suggesting. We see the present study as a first step towards a more thorough assessment of the impact of canopy RT schemes in DGVMs.

We will emphasize these aspects again in a revised version of the manuscript.

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C7408