Comment on gmd-2021-194

Roger Marchand (Referee)

Referee comment on "The Earth Model Column Collaboratory (EMC^2) v1.1: an open-source ground-based lidar and radar instrument simulator and subcolumn generator for large-scale models" by Israel Silber et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2021-194-RC2, 2021

Overall Recommendation: Publish after minor revisions.

The authors have done a nice job in creating a radar-lidar simulator, and I applaud them for making this code freely available and taking the time to document such here. I have no major concerns about the material per se, but there are some aspects of the description that I do not understand very well.

Comments:

I found the description of the overlap scheme difficult to follow and did not come away with a clear understanding of how cloud and precipitation are overlapped. This is important. I hope you will excuse if I point you some work that I and Ben Hillman have done on this topic (https://doi.org/10.1029/2017JD027680). In particular, I don't understand how f_gen is created or how this resulted in the structure shown in column 4 of Figure 4. Perhaps it would help if you included some examples in the overlap description highlighting key aspects of this approach.

I include with this message a copy of the manuscript with some embedded comments that I think you might find helpful, and which highlights places where I was confused or where I think some additional material would improve the manuscript.

Regards,

Roj Marchand

Please also note the supplement to this comment:
https://gmd.copernicus.org/preprints/gmd-2021-194/gmd-2021-194-RC2-supplement.pdf