Comment on acp-2020-1242

Anonymous Referee #2

Referee comment on "Deciphering organization of GOES-16 green cumulus through the empirical orthogonal function (EOF) lens " by Tom Dror et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-1242-RC2, 2021

Shallow Cu account for much of the uncertainty associated with cloud feedback. Unlike trade Cu over subtropical oceans, the continental shallow Cu are less well studied in the literature. This study, by using high-resolution GOES-16 dataset, explored modes of organization of shallow Cu over forests and vegetated areas, also referred to as green cumulus by the authors. The identification, and the influence of GW on the organized patterns of Cu are also investigated in the paper.

While I generally find the manuscript suitable for publication in ACP, further improvements are needed before the manuscript is accepted. Below I have included a list of specific comments that I think should be addressed.

Comments:

Q1: L45, are there any reasons why LES fail in reproducing shallow Cu, as LES can explicitly resolve shallow Cu at a common resolution of 100m.

Q2: L100, the identification of cloud objects, and the definition of cloud fraction and number of clouds are not clearly stated in the paper. I suggest the authors put more words on this part. In Figure 3c, it seems that the cloud fraction and the number of clouds is inconsistent.

Q3: L164, what's the criteria in judging an EOF mode degenerate or nondegenerate?

Q4: L197, why PC5 and PC6 instead of other PCs can be used to identify GW. Are there any objective standards?

Q5: L255, Grammar check "such that the lower the frequency is the larger is the spatial scale that dominates the corresponding EOF".