

Atmos. Chem. Phys. Discuss., referee comment RC2
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Review of acp-2022-385

Anonymous Referee #2

Referee comment on "Impacts of an aerosol layer on a midlatitude continental system of cumulus clouds: how do these impacts depend on the vertical location of the aerosol layer?" by Seoung Soo Lee et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-385-RC2>, 2022

The authors have performed a straightforward study to look at the differing impacts of aerosols on shallow convective clouds depending on the height of the aerosol layer. There are some worthwhile results, but a lot of the text and especially the results section is difficult to read. Parts of it have unnecessarily long sentences or are repetitive. I don't think this paper is ready for publication until a substantial rewrite has been done to make it clearer. A few specific comments follow.

The abstract is rather cumbersome. For instance this phrase: "which are between a situation when the layer is in the low atmosphere and that when the layer is in the upper atmosphere" is used twice and I can't understand what it is saying. I would concentrate less on trying to say every finding in the abstract and instead state a few things more clearly.

97 People *have started to*

98 clouds on clouds is a weird phrase to end a sentence on, I would reword this sentence

Last paragraph of intro is repetitive and clunky.

144 is *used* for

Figure 1 - Rather than showing just a box on a blank map, maybe including a satellite

image here would be good to set the stage for what kind of cloud scene this is.

215 Assumed is written twice

Figure 3 is unnecessary - just state that the aerosol layer is between x and y km.

Do the results in the control run look at all like observations? Really any example of what the cloud field looks like would be helpful in interpreting the results.

505-507 An example, this could be rewritten more clearly as something like: "Figure 8b shows that with no aerosol radiative effects, the differences in cloud mass due to the height of the aerosol layer are much smaller."