First of all, we appreciate the reviewer’s comment. In response to it, we have made relevant revisions to the manuscript. Listed below are our answer and the changes made to the manuscript according to the comment. The comment of the reviewer (in black) is listed and followed by our response (in blue).

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.

Following the comment here, the manuscript is revised substantially. For the revision, many paragraphs and expressions are restructured, and redundant text is removed. For the details of the revision, see the new manuscript.

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.

Based on this comment, abstract is revised substantially to make it succinct. Many sentences are shortened and during this process, some sentences are considered redundant and removed. See abstract in the new manuscript for the details of the revision.

97 People *have started to*

Done.

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

Reworded as follows:

(LL94-96 on p4)

In recent years, people have started to take interest in how aerosol layers affect clouds when these layers are above or around the tops of clouds (e.g., de Graaf et al., 2014; Xu et al., 2017).

Last paragraph of intro is repetitive and clunky.

The whole part of the introduction including the last paragraph is revised substantially to make it more succinct by removing redundant and repetitive text. See the revised introduction in the new manuscript for details.

144 is *used* for

Done.

Figure 1 - Rather than showing just a box on a blank map, maybe including a satelite image here would be good to set the stage for what kind of cloud scene this is.

Figure 2, which shows spatial distribution of satellite-observed cloud reflectivity in the simulation domain, is added.

215 Assumed is written twice

The corresponding text is revised as follows:

(LL207-210 on p8)

Based on the AERONET observation, the shape of the initial size distribution of aerosols acting as CCN is assumed to follow a bi-modal log-normal distribution as shown in Figure 5 in all parts of the domain.

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

Figure 3 is removed and just the altitude of the aerosol layer is mentioned.

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.

The following is added to compare the control run to observation:

(LL274-298 on p10)

We utilize satellite and ground observations to evaluate the control run. The Moderate Resolution Imaging Spectroradiometer (MODIS) is a representative sensor on board polar-orbiting satellites. The MODIS passes the domain only at 10:30 am and 1:30 pm on each day. This means that it is difficult to get reliable data, which cover the whole simulation period, from the MODIS. The COMS, which is a geostationary satellite and available in East Asia, does not provide reliable data of cloud mass. However, comparatively reliable data of cloud fraction and cloud-top height throughout the whole simulation period are obtained from the COMS. Data of cloud fraction and cloud-bottom height over the whole simulation period are collected from ground observations in the domain; note that ground stations which measure PM2.5 as marked in Figure 1b also measure cloud fraction and cloud-bottom height. Here, cloud fraction and cloud-bottom height in the control run are compared to those from ground observations. A comparison of cloud-top height is made in the domain between the control run and the COMS. Cloud fraction, which is averaged over all time points with non-zero cloud fraction over the whole simulation period, is 0.25 in the control run. Cloud fraction is 0.21 when it is averaged over all time points with non-zero cloud fraction that are collected from all ground stations in the domain over the whole simulation period. Cloud-bottom height, which is averaged over all air columns with non-zero cloud-bottom height over the whole simulation period, is 1.1 km in the control run. Cloud-bottom height is 1.0 km, when it is averaged over all time points with non-zero cloud-bottom height that are collected from all ground stations in the domain over the whole simulation period. The average cloud-top height over all air columns with non-zero cloud-top height over the whole simulation period is 2.8 and 2.6 km in the control run and observation, respectively. The difference in each of cloud fraction, cloud-bottom and -top heights between the control run and observations is ~10%. This means that the control run is performed reasonably well.

Also, a satellite image of a cloud field as an example of the cloud field is added. See Figure 2 and associated text in the new manuscript.

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."

Done.

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