Review of "A Lagrangian Perspective on the Lifecycle and Cloud Radiative Effect of Deep Convective Clouds Over Africa" by W. K. Jones et al.

Jones et al. analyze geostationary satellite observations to investigate the diurnal cycle and radiative effects of tropical deep convective clouds over Africa and the tropical Atlantic Ocean. They use a novel cloud-tracking algorithm that allows them to investigate the clouds from a Lagrangian point of view. This analysis shows that individual anvil clouds can have a wide range of radiative effects depending on the time of day that they initiate. Thus, changes in the diurnal cycle of convective cloud be an important and underappreciated climate-feedback mechanism.

I believe that the research topic is highly relevant, the analysis is well done, and the writing and figures are clear and concise. I have only a few comments and suggestions for improvements, which are listed below. I therefore recommend *minor revision* for the manuscript.

General Comments

My only main comment about the paper is that the discussion about how the results relate to the existing cloud-climate feedback literature is not as specific as I hoped it would be. The authors make a compelling case that changes in the diurnal cycle of convection could be an important and understudied climate-feedback mechanism, but the discussion about how to address this challenge is not very clear. Can the results of the current study help to estimate the diurnal-cycle-induced climate feedback? If not, then what are some ways that we might make progress on this in the future? Have any physical mechanisms been proposed that would change the timing or amplitude of the convective diurnal cycle as the climate changes? Does the community have the necessary analysis methods to diagnose this feedback? As far as I know, none of the current methods of cloud-feedback analysis can diagnose feedbacks from changes in the diurnal cycle of clouds, so I'm not even sure that the community has the proper tools to study this rigorously. I think that a more specific discussion about how the results relate to the existing cloud-feedback literature and potential future directions would improve the end of the paper. It would also align well with the introduction, which discusses anvil-cloud feedback mechanisms at length.

Specific Comments

Line 161 "we only detect and track the thick portion of the anvil in this article": Can you be more specific about what "thick portion" means? For example, can you state the minimum cloud visible optical thickness that can be tracked by the algorithm?

Section 4.2: I think the current analysis in this section is well done, but I wonder if an even stronger signal would emerge if the analysis was performed separately with land-based convection and ocean-based convection. I think that oceanic clouds are typically larger, longer lasting, and have less intense convection than land-based clouds, so the land-ocean contrast may alias into the statistics in Fig. 6 and Fig. 7.

Line 284: This paragraph is written in a way that seems to imply that the average anvil-cloud net CRE must remain near zero as the climate changes. I'm not aware of any

convincing physical mechanism or conservation law that would require the net anvil-cloud CRE to remain near zero. Can you please explain why you think it will remain near zero or acknowledge the possibility that it will not remain near zero?

Technical Corrections

Line 15: The word “distribution” is used twice in the sentence. Consider changing to “We find that the anvil cloud CRE of our tracked DCCs has a bimodal distribution.”

Line 227 (and elsewhere): I think the name “Genio” should be “Del Genio”

Line 279 “We see that, as expected, mean anvil CRE becomes more positive with increasing CTT”: Should this be “mean anvil CRE becomes less positive or more negative …”

Line 308: change “outsize” to “outsized”