

Atmos. Chem. Phys. Discuss., referee comment RC2  
<https://doi.org/10.5194/acp-2021-420-RC2>, 2021  
© Author(s) 2021. This work is distributed under  
the Creative Commons Attribution 4.0 License.

## **Comment on acp-2021-420**

Anonymous Referee #2

---

Referee comment on "A climatology of trade-wind cumulus cold pools and their link to mesoscale cloud organization" by Raphaela Vogel et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-420-RC2>, 2021

---

The authors present a careful study of thousands of cold pools from a long and detailed record of observations from the Barbados Cloud Observatory. As well as the excellent statistics from a data set of this size, vertical profiles of hydrometeor fraction are a novel and interesting addition to the study. Summer cold pools resemble those previously found for deep convection, while winter trade wind conditions have cold pools with positive water vapor anomalies at the head of their fronts. Cold pool occurrence and shape are also diagnosed according to the diel cycle and cloud pattern classification (Sugar, Gravel, Flowers, Fish) of Stevens et al. 2020.

The paper presents long and detailed analysis. At times I would have liked it to state the results more succinctly, yet overall I found it interesting, and readers will be able to find a great deal of detail when they want it. I recommend publication with minor revisions. In the annotated PDF I have included some minor comments on the science and line edits intended to improve clarity and readability.

Please also note the supplement to this comment:  
<https://acp.copernicus.org/preprints/acp-2021-420/acp-2021-420-RC2-supplement.pdf>