Atmospheric
Chemistry
and Physics
Discussions

Interactive comment on "**Building a cloud in the Southeast Atlantic: Understanding low-cloud controls based on satellite observations with machine learning**" *by* Julia Fuchs et al.

Anonymous Referee #1

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"Building a cloud in the Southeast Atlantic: Understanding low-cloud controls based on satellite observations with machine learning" by Fuchs et al. applies a machine-learning program to satellite observations and studies the factors that influence cloud properties in the southeast Atlantic. The method is novel and by itself worthy of publication. The findings on sub-regional variability in dominant factors are interesting and promote better understanding of the climate in the region. The manuscript is written well. I recommend publication. The authors may consider the following suggestions.

Discussion on the data size and the robustness of statistics would be helpful. The variables and their spatial and temporal ranges are given in Section 2.1 and Section

2.2. But I find it difficult to determine whether some sharp features (e.g., in Figure 3d around 282.7K) are a result of poor counting statistics.

Page 1, line 20. Remove the first comma.

Page 3, line 33. What is meant by "generalize, its performance and computational demand"?

Page 5, line 12. Rephrase "relative humidity is essential for cloud formation processes and characteristics".

Page 6, line 15. Break down the long sentence.

Page 7, line 8. "LTS is most sensitive to CF". Did you mean "CF is most sensitive to LTS"?

Page 10, line 10. "the reduction of CF by subsiding dry air". Isn't subsidence usually associated with higher stability and more clouds?

Page 10, the paragraph starting in line 27, or later. Figures 5-11 are from only one model run selected at random. How representative are these snapshots of all model runs?

Page 11, line 1. Remove the first comma.

Page 11, line 3. Remove the first comma.