Review of "Influence of Lower Tropospheric Moisture on Local Soil Moisture-Precipitation Feedback over the U.S. Southern Great Plains" by Wang et al.

General comments:
This paper examines the role of lower troposphere (LT) moisture in land-atmosphere coupling (LAC) using radiosonde data from the US Southern Great Plains (SGP) site. The analysis focuses on afternoon precipitation events (APEs) in the warm season (May– September). It is found that LT moisture has a greater impact on dry-coupling APEs than on wet-coupling APEs. A higher B_{LT}, which is a vertically integrated LT buoyancy uncoupled with the PBL humidity, tends to increase both the frequency and intensity of dry-coupling APEs. The paper is overall well-structured and easy to follow, and the findings clarify the importance of warm-season LT moisture in dry-coupling conditions in the SGP. I have a few minor suggestions for the authors to consider.

Specific comments:
1. While the Introduction Section provides a detailed review of previous studies of LAC and LT moisture, little is mentioned about the SGP and why this region is selected to study the impact of LT moisture. It is also not clear why ARM SGP radiosonde data were used as the primary data in this work. A brief background information about LAC and LT moisture in the SGP and a clarification of the novelty of the approach would be helpful and informative in the Introduction Section.

2. The concept of the lower troposphere (LT) was brought up very early in the paper, but it is not clearly defined until section 2.2 (line 135). It would be better to clarify the definition of LT in the earlier part of the paper.

3. It would be nice to have a section to discuss the uncertainties associated with the data and/or methodology. For instance, the coupled LT humidity profile is reconstructed by linear regressions. What's the uncertainty of the approach? Are all the APEs convective precipitation? In addition, it also would be interesting to briefly discuss to what extent the approach used here and findings in the SGP can be generalized to other regions.

4. In section 2.1, it would be nice to provide more details about the SGP CF site, such as location (lat, long), data coverage, and why the site was selected.

5. In sections 2.1.1-2.1.3, please add information about the temporal resolution and coverage of the datasets and variables used in the paper. It also would be informative to discuss the error ranges of the data, if possible.

6. Section 2.1.4, can you please provide the equation used to calculate PBL height?

7. Line 116, how do you determine the height of the mixed layer?

8. Section 2.4, are both dry- and wet-coupling defined on the daily time scale?

9. I suggest moving Figure S1 to the main text, as it provides useful information and there is sufficient room for one more figure in the main text.

10. Fig. 1, please consider marking the coefficients that are significant at the 95% confidence level. The caption mentioned "…value of 18 years", but 2001-2019 (line 74) is 19 years.

11. Figs. 2-3, consider marking profiles where the composite differences are significant.

12. Fig. 4, why is the data coverage 2001-2018 instead of 2001-2019?

Technical corrections:
1. In lines 216 and 219, there is no "Figure 4a" nor "Figure 4b".

2. In Figure 5, the last label of the x-axis ("200") is too close to the first label of the vertical axis of the bar plot ("0"), so it looks like "2000".