Review report of the paper "**Variability and trend analysis of temperature in the upper troposphere and stratosphere region over the tropics (Réunion), by combining balloon-sonde and satellite measurements**" by Gregori de Arruda Moreira et al.

The paper "**Variability and trend analysis of temperature in the upper troposphere and stratosphere region over the tropics (Réunion), by combining balloon-sonde and satellite measurements**", authors investigated how temperature and the height of the tropopause are changing over the tropics near Réunion Island using 15-year data from radiosonde, COSMIC-1 and MERRA-2. Using the combined datasets, they assess how well different methods match when estimating the tropopause height to explore a refined long-term trend. Studying tropopause temperature and height variability is very important for understanding the anthropogenic contribution to climate change, which is a highly relevant topic in ANGO. Given the sparse availability of datasets from the Southern Hemisphere, a long-term report on this subject from Réunion is particularly valuable and much needed. However, the referee feels that the paper currently lacks some important details, and the authors should provide further clarification on following concerns before the manuscript can be considered ready for acceptance.

Major concerns:

1. Methodology:

The methodology section requires more detail and clarification. The authors state that they used radiosonde temperature profiles from 2006–2020 (available weekly) together with COSMIC-1 RO data within a margin of ±2° and ±3° spatial resolution. However, it is not clearly described how simultaneous these datasets were. Although they showed examples of simultaneous measurements in Figure 2, a clear description should be given in the methodology. As in Table 1 indicates a larger number of COSMIC profiles, but it is not specified whether the authors computed weekly averages of these data to match the radiosonde records, or how day-to-day variability was accounted for. Although a long-term analysis, a clear description of data is required for the reliability of the derived tropopause characteristics.

Another concern about the Trend-Run model, the authors used a simplified approach to evaluate trend by only reporting the coefficient of determination (R^2). However, R^2 alone cannot provide information about the reliability or statistical significance. The authors are encouraged to include uncertainty analyses, for example confidence intervals and performing sensitivity tests to demonstrate which forcings have the most significant influence on the results.

2. Lack of proper discussion:

Using the combined dataset, the authors identified differences/similarities in estimating tropospheric heights both CPT and LRT and reported some seasonal variations and small but significant long-term changes in tropopause temperature and height, which are important for understanding climate change. However, they did not properly discuss these results in the broader context of atmospheric dynamics, radiative forcing, or anthropogenic climate forcing. The

discussion is limited to a brief comparison with Sivakumar et al. (2011) and Bègue et al. (2010) etc. The authors should expand the discussion of the results with additional published works and explain how their results align or diverge from global findings, focusing on the uniqueness or similarities of TTL dynamics in the southern hemisphere. Without a clear discussion and interpretation of the results, the manuscript remains incomplete in its current form.

Minor concerns:

1. The introduction could be improved by more clearly highlighting key gaps in studying tropopause height and temperature over the tropics, and particularly importance of study over Réunion. While this section is otherwise well written and easy to follow, motivation of the study would be stronger if the authors emphasized these gaps more explicitly.
2. Line 100: I feel the sentence 'Therefore, temperature gradients ….. and chemistry.' is irrelevant here.