Response 2

The authors use ERA5 reanalysis data and global positioning system radio occultation (GPS-RO) measurements over 11 years (2007–2017) to study inversions over the Namibian coastal region. They find that low-level inversions are less frequent inland away from cold water, consistent with expectations. They also find that low-level inversions peak in winter and at a lower altitude. Typical depths ranging from 10 to 125 hPa and strengths between 3 °C and 9 °C are quoted in the text, but there is no systematic tabulation, assessment, or discussion of these values. Some contemporaneous aerosol data and stability profiles are shown but there is a lack of a clear description regarding why the aerosol is there or how it might influence anything. There are approximately 106 almost identical-looking temperature profiles shown as 106 separate panels in this paper. The overall approach of using satellite data and ERA5 data to better understand this region is sound. However, it isn't clear what the goals of the paper are. Perhaps the main goal is to document the seasonal cycle, but that theme is not explored much. If the lower tropospheric portion of the profiles were "zoomed-in on", then the reader could see some of the features. If an attempt to quantify inversion strength and height were included and tabulated, it might be possible for the reader to judge for themselves what the authors claim at places in the text, but based on what is presented. To show causality between profiles and aerosol data would require further study. I cannot recommend publication in its present form. I am including some specific comments which may be useful to the authors if choose to revise the manuscript.

1. Introduction: How does SST variation affect timing of maximum inversion in late winter? How does strength of the SA high affect timing? How does the LLJ vary with time of year? The last two sentences of the introduction do not seem to be carried through in the paper. Please clarify what the purpose of your paper is.

   We have now discussed variation in SST, SAH and LLJ in new sections. Please see sections 2.3, 3.3 and 3.4

   Also, the last two sentences of the introduction are now revised to express a clear purpose of the paper (L69)

1. You could use ERA5 data to show what the SA high looks like and how the SA high changes with season.

   We have now included a subsection (please see section 2.3) to describe the SA high and other related synoptic scale atmospheric patterns that govern stability over the region.

1. l63: What does this mean?: "the impact of stratus clouds on the formation of the stratocumulus cloud deck". What does this mean?: "the relationship between the strength of atmospheric stability, as identified by the data, and the lower tropospheric stability (LTS)"

   The statement sites the intention to examine the effect of the thermal stratification on stratus and stratocumulus clouds formation. Also, to investigate the link between atmospheric stability and LTS which is found to be correlated to cloud fraction over the region (see Klein and Hartman 1993).

1. l73: Why not use a uniform width based on km?

   The statement is now modified as below

   L72 >> "The coastal margin was demarcated as a 500 km (5°) band along …" now in L80

1. l152: "low-level inversion occurs more obviously over the ocean than on land" – this is hard for me to see in the figure. You also mention the South Atlantic pressure system, but you don't show any pressure charts, so it is hard to tell what you mean. How does this fit with the seasonality of your results? Also, What is happening with SSTs? Isn't that important for individual times and for a seasonal evolution?

   The figure referred to is now modified for clarity and the large-scale weather pattern associated with the region is being discussed in section 2.3

1. l164-165: “Typically, weak South Atlantic anticyclones over the ocean coupled with a strong Benguela current …” Can you show this in a figure?

   Figure now included, please see Fig 2.

1. l179: Fig. 4 only goes up to 950 hPa. Are there any taller inversions of interest?

   Obviously yes, there are other inversion of interest above 950hPa. Hence Fig 4. is modified to extend up to 800 hPa and now labelled as Fig. 6

1. Fig. 2: Why show Jan – August but not Sept - December? Suggest showing region below 700 hPa as blown-up inserts in lower left of each panel.

Suggest showing difference profile for each month. The plots look the same from a distance, so only one ERA plot is needed for the full profile.

Fig 2. (now labelled Fig 3) is adjusted for better view and accompanied with a new figure (i.e., Fig 4.) to show the correlations among inversion strength, depth and top height between the two datasets. Also, plots for all months are now shown.

1. Fig. 4: Please explain for the reader why one might expect inversions south of 11S but not north of there. You could zoom in on the active regions and not show so much neutral space. The labels are too small to be seen easily.

   Fig 4. (relabelled as Fig. 6) is now corrected and zoomed-in on focused region.

1. Fig. 5: It's pretty hard to see much of anything. Every panel looks pretty much about the same as all of the other ones. It would be more effective to tabulate inversion strength and height for ocean and land

by month, or to plot the two time series of inversion strength and inversion height as a function of time.

A revised version of Fig. 5 (relabelled as Fig. 7) is now presented for clarity.

1. Fig. 6: You could try plotting the diurnal cycle for the chosen times of year as separate line plots connection the values of inversion strength, and the values of inversion height, so that readers could visualize the diurnal cycle.

   Fig. 6 (relabelled Fig. 8) is revised to show the diurnal cycle of the inversion properties over the selected times.

1. Fig. 7: The plot insets each look about the same as each other. What is the reader supposed to notice? The symbols strings in the two lines above each plot do not mean much to the reader.

   Fig. 7 is revised and relabelled Fig. 11.

1. Fig. 9: The stability profiles look similar in each panel. I can see differences in aerosol, however. Can you show the stability profiles zoomed in on the BL so that the reader could see if there are any differences among the panels that might relate to differences in aerosol?

   A zoomed-in on Fig. 9 is now presented as Fig.12

1. Fig. 10: Does this include clouds at any altitude and both inversion types all blended together? (I couldn't locate reference to Fig. 10 in the text.)

   This is for low-level clouds only and all inversion types blended. However, the figure has been revised to be based on daily inversion cases rather than averagely based previous version (see Fig. 13).