

# Review of the Paper « Impact of Convectively Coupled Tropical Waves on the composition, vertical structure of the atmosphere and Tropical Cyclogenesis in the region of Cabo Verde in September 2021 during the CADDIWA campaign »

Dear Editor

Thank you and the referees for the thorough reviews.

Please find in the following the detailed answers to the reviewer's comment :

## Reviewer #1

1. Page 3, line 61: "... but will remain outside the scope of this study..."

Corrected in the text.

2. Page 4, line 106: "...aerosol optical depth ...)"

Corrected in the text.

3. Page 5, line 130: "Information on all datasets is compiled in table 1." I would put this at the beginning of the paragraph in line 106.

Corrected in the text.

Figure 8: Please specify what the dashed vs solid lines are and what red vs green lines represent in the the caption. The legend is not very clear on this (and maybe doesn't follow the notation used in the text?)

Precision added in the caption. Solid line are dry temperatures, dashed lines dew point. Red lines are for humid phases, green lines (now blue to improve accessibility for coloblind people) are for dry phases.

## Reviewer #2

1. Line 63: "...in shaping extreme events Lafore et al. (2017); Peyrillé et al. (2023). → "...in shaping extreme events (Lafore et al., 2017); Peyrillé et al., 2023)."

Corrected in the text.

2. Lines 74-75: Could the authors please clarify this statement? The dependence of impact on distance remains unclear.

Precision added in the text :

The impact is also dependent on the relative location of the dust-ladden layer to the center of the convective activity: it has been found to have a catalyzing effect when being in the

northwest quadrant further than 360km from the center of convection, but has a inhibiting effect when coming closer than 360km in the southwest quadrant.

3. Line 91: "(2018), that..." → "(2018) that..."

Corrected in the text.

4. Line 130: "...in table 1." → "...in Table 1."

Corrected in the text.

5. Line 150: What is the "R coefficient"?

Correlation coefficient. Corrected in the text.

6. Lines 168-169: "...Figure 2-b and c show..." → "...Figures 2-b and c show..."

Corrected in the text.

7. Lines 178-179: This statement would benefit from supporting references to demonstrate that the MJO was in an active phase during the specified three-week period.

This statement is based on the results of the wave decomposition described in the method for the MJO domain. Precision added in the text:

result from the TCWV decomposition in the MJO domain, not shown

8. Line 196: Please provide an explanation of "cycles per day (cpd)", either here or in the caption of Figure 2, to aid reader understanding.

Added in the text.

9. Line 198: "...Figures 2b and Fig. 2c..." → "...Figures 2b and 2c..."

Corrected in the text.

10. At the bottom of Figs. 1b and 1c, "WESTWARD" overlaps with "Zonal Wavenumber". Please make the necessary adjustment.

Figure corrected.

11. Line 215: "figure 3" → "Figure 3"

Corrected in the text.

12. Line 243: "Figures 4b and c show" → "Figures 4c and d show"

Corrected in the text.

13. Line 244: "of Matsuno (1966))" → "of Matsuno (1966)"

Corrected in the text.

14. Figure 4: Please explain the unit of wind vectors.

Precision added in the figure.

15. Figures 4c and 4d: According to Figs. 4a, 4b, and 5, I believe the humid (dry) phase associated with the Kelvin wave should be shown in Fig. 4c (4d) rather than Fig. 4d (4c).

Figure corrected.

16. Kindly refer to the figures with more precision.

- ① Line 287: "(Figures 6 and 7)" → "(Figures 6c and 7c)"
- ② Line 301: "(Figure 7)" → "(Figure 7b)"
- ③ Line 309: "(see Fig 6 c and d)" → "(see Fig. 6d)"
- ④ Line 309: "(see Fig 7 c and d)" → "(see Fig. 7d)"
- ⑤ Line 342: Which Figure result are you referring to?

Corrected in the text.

17. Lines 297-299:

- ① A left bracket appears in Line 298, but I could not find the corresponding right bracket.
- ② I could not see significant southerlies over the continent in the Kelvin humid phase (Fig. 4d).

Corrected in the text for the bracket. As for the southerlies, they are actually shown on the « dry phase » panel, as the humid phase is above the continent when the dry phase is above cabo verde. Sentence changed to improve clarity:

see Figure 4d that shows southerlies when the Kelvin humid phase is located above the continent, increasing the monsoon flow

18. Line 332: "...dew-point.Schlueter..." → "...dew-point. Schlueter..."

Corrected in the text.

19. Line 340: "Figures 8d,e and e" → "Figures 8d,e and f"

Corrected in the text.

20. Figure 8: I am confused about the labels and captions. Top of Fig. 8b (8c) shows "ER- Latitude (10-15)" ("ER- Latitude (15-20)"), whereas the caption of Fig. 8 states: "(b) AEROIASI vertical dust extinction composite for the humid and dry phases of ER wave on IASI North Zone. (c) Same as (b) but for IASI South Zone." It seems the labels or captions for Figs. 8b and 8c might be swapped. In addition, there is no description of the phase represented by the line colors. This should be added for clarity.

Corrected in the caption. The title of the figure was right.

21. Caption of Figure 9: "Number of days in IASI North Zone in dry (resp. humid) phase: 19 (resp 20). Number of days in IASI North Zone in dry (resp. humid) phase: 17 (resp 14)." It appears that the statement is repeated, or alternatively, one of them is intended to describe the South Zone. The same issue is present in the caption of Figure B1 as well.

Corrected in the text.

22. Line colors in Figures 6-9 and B1: Many people are red-green colorblind, so please choose different colors.

Color palette changed.

23. The caption of Fig. 10 states that the values are averaged between 0°N and 20°N; however, Line 371 indicates “between 5°N and 20°N”. Could you clarify which one is correct?

Corrected in the text. The caption was the right one.

24. Lines 370-377: A statement describing the results of the Kelvin waves (Fig. 10a) appears to be missing and should be included for completeness.

Sentence on Kelvin wave added in the text:

25. Line 418: “...kelvin waves...” → “...Kelvin waves...”

Corrected in the text.

26. Line 508: “...TC development Hanks et al. (2015); Duvel (2021); Jonville et al. (2024a)...” → “...TC development (Hanks et al., 2015; Duvel, 2021; Jonville et al., 2024a)...”

Corrected in the text.

27. Figure 11: There is no description of the bar at the bottom of the figure; this should be added to the caption for clarity. In addition, the figure itself does not include the labels '(a)' or '(b)', even though they are referenced in the caption.

Description of the bars added in the caption.

28. Figure B1: There is no description of the phase represented by the line colors. In addition, as I mentioned in my previous recommendation, the line labels below panels (a) and (b) are inconsistent. Specifically, the dashed lines below panel (b) should represent the dew point (see below).

Corrected in the figure and caption.