Review of egusphere-2025-2485

Title: Equatorial wave circulation associated with subseasonal convective variability over the subtropical western North Pacific in boreal summer

General comment

The manuscript investigates the relationship between equatorial waves and convection over the subtropical western North Pacific (SWNP). This study applies wave decomposition to extract the signals of four equatorial waves and then regresses these onto OLR anomalies over the SWNP region. The authors provide a detailed analysis of the interaction between wave-related wind fields and SWNP convection. However, some viewpoints would benefit from further elaboration and discussion. Therefore, I recommend a major revision. My detailed comments are provided below.

Specific comments

1. Lines 17–18: Since MRG waves exhibit strong meridional flow across the equator (Fig. 9; Line 12), they might also contribute to linking SWNP convection with the extratropical circulation. Please consider discussing this possibility.

2. Lines 33–34: Please clarify what the "Pacific–Japan pattern" and the "Australia–South Pacific–South Atlantic pattern" refer to.

3. Lines 50–52: Since the manuscript mainly discusses boreal summer, citing studies focused on boreal winter here feels somewhat abrupt.

4. Section 2.2: Does the wave decomposition method allow for interactions among modes, or potential signal leakage between different wave modes?

5. Figure 1 / Lines 143–144: If the u and v components are shown separately as shading, can the discussion in Lines 143–144 still hold? Since the reference vector has different magnitudes for Rossby modes + Kelvin waves and IG modes + MRG waves, it is difficult to interpret this result as currently presented.

6. Lines 163–164: I do not understand the statement "the opposite is true for $\tau > 0$." Additionally, could the discontinuity or continuity in the data impact on the analysis or results?

7. Line 328: Why does convective activity over the SWNP region shift westward? Some explanation would help.

8. Figures (except Fig. 1): The blue box denoting the SWNP region is not very clear, especially when placed over the blue shading. Please consider improving its visibility.

9. Given that the manuscript emphasizes OLR anomalies as an indicator of SWNP convection, have the authors analyzed wave-related moisture, OLR, and precipitation in relation to SWNP convection? Such an analysis could strengthen the results.

Minor comments

1. Line 124: 'modes' and 'waves' $\rightarrow$ 'modes' and 'waves'

2. Line 179: Did the authors mean "at every pressure level"?

3. Line 265: It is not clear what is meant by the "Australia–South Pacific–South Atlantic pattern." Please clarify.

4. Lines 270–271: It is unclear how the authors determined that the northeasterly outflow from the SWNP is decoupled from the anticyclone in the SH.

5. Lines 287–289: The discussion would benefit from further elaboration on why pre-existing Kelvin waves are present over the SWNP.

6. Figure 1: The units for horizontal winds are not indicated.

7. Caption of Fig. 2: The current text reads "The contouring interval for the meridional wind is ±0.5 m/s starting at ±0.5 m/…". This seems to contain a typo. Should it be "The contouring interval for the meridional wind is ±0.5 m/s starting at ±0.5 m/**s**…"?

8. Caption for Fig. S2c–d: How did the authors compare Figures 3a–b with Figures 4a–b? Figures 4a–b show longitude–pressure cross sections, while Figures 3a–b are longitude–latitude maps.