# Reviewer Comments

**General Comments:**

The classical Ekman theory primarily focuses on the characteristics of Ekman currents in mid- and high-latitude regions. This manuscript investigates Ekman layer depth and Ekman plumping speed in the equatorial region using surface drifter trajectories. This approach demonstrates a certain level of innovation. The manuscript would be better from a more detailed explanation of the methodology and assumptions used in the calculations. Since some readers may not have read the authors' previous paper: Paldor (2024), it would be helpful to provide an overview or reference to the key findings or methodologies from that work to ensure clarity and context for the current study. This will help readers better understand the foundation and progression of the research presented in this manuscript. Additionally, the discrepancies in the data ranges need to be addressed to improve the overall quality of the manuscript.

Here are some specific suggestions:

**Lines 18-22:** Please provide more details in your abstract. For example, the specific latitude defining the equatorial ocean should be clarified. Specifically, what are the deflection angles between current velocity and wind speed, as well as between current velocity and water mass transport? It should be explained why the angle is 90°. How are the equatorial current and the equatorial Ekman flow distinguished? Why it is defined as equatorial Ekman flow?

**Line 43:** There is an extra comma in "Ekman layer."

**Lines 50-52:** The text in these lines is difficult to comprehend and should be revised for clarity.

**Line 75:** Is the formula derived from Paldor (2024)?

**Line 91:** It is mentioned that 30,000 buoys were deployed from 1979 to 2025, but the wind stress data is from 1999 to 2009 (Line 120). This discrepancy should be clarified.

**Line 127:** Are the regional variations in the Pacific and Atlantic Oceans significant? This should be discussed in more detail.

**Line 147:** The estimation of vertical velocity w appears to be overly simplistic. A more rigorous approach, such as calculating differentials between two consecutive time points of each drifter trajectory, should be considered.