Response to Reviewer Comments

Manuscript title: "Translational Dynamics of Bridled Kites: A Reduced-Order Model in the Course Reference Frame"

We thank the Reviewer for the positive assessment of our work and the helpful comments. Below we provide a point-by-point response. Reviewer comments appear in *italics*, followed by our responses.

Minor Comments

** When θ_b is introduced on line 94, the formula is not yet clear, that only comes on line 104. I recommend making a forward reference to Equation (2) and adding θ_b in Figure 2.*

We thank the reviewer for this suggestion. In the revised manuscript, we now add a forward reference to Eq. (2) at the point where θ_b is first introduced. We also updated Figure 2 to include the angle θ_b, ensuring visual consistency with the equations and narrative. This improves clarity for the reader.

** All values in Equation (3) should be defined below it.*

We agree with the reviewer. We have updated the text following Eq. (3) to define all variables used in the expression, including the yaw rate $\dot{\psi}$ and apparent wind speed v_a. This ensures the equation is self-contained and understandable to all readers.

** On line 174, "equations of obtained" should be "equations obtained"*

Thank you for spotting this typo. We have corrected the phrase to "equations obtained" in the revised manuscript.

** The radial velocity is also set to zero "for practical implementation" on line 296. I understand that this is not used as equilibrium condition, but it is strange to mention this so late in the process, after emphasizing that only the tangential acceleration is set to zero.*

We thank the reviewer for this observation. In the revised manuscript, we clarify that the radial acceleration $\dot{v}_r$ is treated as a user-controlled input—both in the dynamic and quasi-steady models—and is not part of the equilibrium condition. The quasi-steady formulation is strictly defined by the vanishing of tangential acceleration, $\dot{v}_\tau = 0$. While the radial motion can be held constant in some simulations for simplicity, this is not an inherent part of the quasi-steady model definition, and we have removed the earlier statement to avoid confusion.

** On line 383, the gaps in the curves of Figure 8 are explained, but this could be explained in more detail. What is observed if the model is applied to these situations?*

We thank the reviewer for this helpful comment. The gaps in the estimated quantities correspond to situations where the model cannot resolve a quasi-steady solution—i.e., no tangential speed (or, equivalently, angle of attack) can be found that satisfies the force equilibrium given the measured state. This is analogous to the absence of a zero crossing in the tangential acceleration curve shown in Fig. 6.

This behaviour is particularly evident in the TU Delft V3 dataset, where the system was equipped with a disproportionately large KCU and a relatively heavy tether compared to its small wing area. As a result, certain flight segments, especially during the climbing phase after a turn, fall outside the validity domain of the quasi-steady model. In these cases, applying the model yields no physical solution, and the corresponding points are omitted in the plots to reflect this.

We have revised the text in Subsection 5.2 to clarify this explanation and highlight the conditions under which the model fails to find a solution.

* *Missing text on line 487.*

We thank the reviewer for catching this. The affected subsection has been revised, and the missing sentence is now complete.