**Appendix C:** Derivation of Eq. 35

Substituting Eqs. (22)-(C1), (24)-(28) and (31)-(34) into Eq. (21) yields

 (C1)

Expanding the above equation using the relations of Eqs. (9), (10), (12), (18) and (20) leads to:

 (C2)

And subsequent reformation of Eq. (C2), the final form of the energy equation within the control volume on the surface of the wing can be expressed as:

 (C3)