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Characteristics of the flow around tandem flapping wings LUKE MUSCUTT, BHARATHRAM GANAPATHISUBRAMANI, GABRIEL WEYMOUTH, The University of Southampton, THE UNIVERSITY OF SOUTHAMPTON TEAM — Vortex recapture is a fundamental fluid mechanics phenomenon which is important to many fields. Any large scale vorticity contained within a freestream flow may affect the aerodynamic properties of a downstream body. In the case of tandem flapping wings, the front wing generates strong large scale vorticity which impinges on the hind wing. The characteristics of this interaction are greatly affected by the spacing, and the phase of flapping between the front and rear wings. The interaction of the vorticity of the rear wing with the shed vorticity of the front wing may be constructive or destructive, increasing thrust or efficiency of the hind wing when compared to a wing operating in isolation. Knowledge of the parameter space where the maximum increases in these are obtained is important for the development of tandem wing unmanned air and underwater vehicles, commercial aerospace and renewable energy applications. This question is addressed with a combined computational and experimental approach, and a discussion of these is presented.

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