

Abstract Submitted  
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**Effect of wing flexibility on phasing of tandem wings in forward flight** VISHAL NAIDU<sup>1</sup>, JOHN YOUNG<sup>2</sup>, JOSEPH LAI<sup>3</sup>, University of New South Wales — The dragonfly with two pairs of wings in tandem uses different phases between the wing pairs to suit the needs of the flight. Previous studies to understand the effect of phasing in forward flight are based on rigid wings. This is in contrast to the highly flexible dragonfly wings, with varying spanwise and chordwise flexibility. Here, we study flexible flapping wing simulations using Fluid Structure Interaction (FSI) in forward flight, at an advance ratio of 0.3 and Reynolds number of approximately 1300. The FSI simulations are carried out for phase  $90^\circ$  (hindwing leading),  $0^\circ$  (in-phase) and  $180^\circ$  (anti-phase). The performance of flexible wings will be compared with that of the rigid wings and the effect of flexibility will be discussed.

<sup>1</sup>PhD Student

<sup>2</sup>Senior Lecturer

<sup>3</sup>Professor

Vishal Naidu  
University of New South Wales

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