

Abstract Submitted  
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**Vectoring of parallel synthetic jets**<sup>1</sup> TIM BERK, BHARATHRAM GANAPATHISUBRAMANI, GUILLAUME GOMIT, University of Southampton — A pair of parallel synthetic jets can be vectored by applying a phase difference between the two driving signals. The resulting jet can be merged or bifurcated and either vectored towards the actuator leading in phase or the actuator lagging in phase. In the present study, the influence of phase difference and Strouhal number on the vectoring behaviour is examined experimentally. Phase-locked vorticity fields, measured using Particle Image Velocimetry (PIV), are used to track vortex pairs. The physical mechanisms that explain the diversity in vectoring behaviour are observed based on the vortex trajectories. For a fixed phase difference, the vectoring behaviour is shown to be primarily influenced by pinch-off time of vortex rings generated by the synthetic jets. Beyond a certain formation number, the pinch-off timescale becomes invariant. In this region, the vectoring behaviour is determined by the distance between subsequent vortex rings.

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