

Computational Fluid Dynamic Investigation into the Relationship between Pressure and Velocity Distributions within a Microfluidic Feedback Oscillator

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Abstract : Fluidic oscillators are being utilised in an increasing number of applications in a wide variety of areas; these include on-board vehicle cleaning systems, flow separation control on aircraft and in fluidic circuitry. With this increased use, there is a further understanding required for the mechanics of the fluidics of the fluidic oscillator and why they work in the manner that they do. ANSYS CFX has been utilized to visualise the pressure and velocity within a microfluidic feedback oscillator. The images demonstrate how the pressure vortices build within the oscillator at the points where the velocity is diverted from linear motion through the oscillator. With an enhanced understanding of the pressure and velocity distributions within a fluidic oscillator, it will enable users of microfluidics to more greatly tailor fluidic nozzles to their specification.

Keywords : ANSYS CFX, control, fluidic oscillators, mechanics, pressure, relationship, velocity

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