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Jet Interaction Studies in a Fluidic Oscillator JAMES GREGORY, JOHN SULLIVAN, School of Aeronautics and Astronautics, Purdue University, SURYA RAGHU, Advanced Fluidics Corporation — The fluidic oscillator evaluated in this study operates on the interaction of two colliding jets in a two-dimensional mixing chamber. The jet interaction forms an internal oscillating shear layer driven by oscillatory growth of counter-rotating vortices, producing an external oscillating jet at frequencies on the order of kilohertz. Experimental studies involved pressure transducer measurements and flow visualization with pressure-sensitive paint. The effects of various geometrical and gas species configurations were evaluated. Inlet geometry, device scaling, aspect ratio, and supply gas were all varied. These studies reveal that three-dimensional jet interaction becomes dominant for large devices or for high aspect-ratio devices. Mode-hopping behavior was also observed at low flow rates, and was dependent upon inlet geometry.

James Gregory
School of Aeronautics and Astronautics, Purdue University

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