

Abstract Submitted
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Numerical Simulation Applied to Micromixer Design¹ DAVID MOTT, Laboratory for Computational Physics and Fluid Dynamics, Naval Research Laboratory, DANIEL MARKUS, University of Maryland, PETER HOWELL, JOEL GOLDEN, Center for Biomolecular Science and Engineering, Naval Research Laboratory — We describe the development of new microfluidic components designed to optimize mixing. The components use pressure-driven flow and consist of a microchannel with surface features (such as diagonal grooves, chevron-shaped grooves, and herringbone-shaped grooves) cut into the top and/or bottom of the channel. We describe a fast advection routine used to predict the transport of passive scalars through the components and the various metrics used to characterize the effectiveness of a proposed design. We also present mixer designs optimized for our chosen metrics over our feature set and compare the numerical predictions with experimental results.

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