Low-Cost Optimization for
Fast-Microfluidic-Mixer Shape Design

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Abstract - We give an unified formulation for deterministic and stochastic global optimization algorithms via initial and boundary value problems for different first and second order dynamic systems. The ensemble is applied to the design of a fast-micro-mixer. The aim is to optimize a given mixer shape in order to reduce its mixing time. The algorithms are compared from their complexity and optimization efficiency. In order to reduce computational time approximate state and sensitivity evaluations are introduced during optimization.

Keywords: Shape optimization, Global optimization, Dynamical systems, Boundary value problem, Microfluidic mixers.

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