Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

The Shear Superposition Micromixer : An Efficient and Fast Micromixer FREDERIC BOTTAUSCI, CAROLINE CARDONNE, IGOR MEZIC, CARL MEINHART, University of California Santa Barbara — In the current paper we present new experimental and numerical results showing high efficiency mixing procedures for an active shear superposition micromixer (SSM). This micromixer consists of a main mixing channel where unmixed fluids are perturbed by jet flows emanating from a series of transverse channels. Mixing of two fluids is achieved using the kinetic of the side jet flows. mixing process is studied numerically and experimentally using flow visualizations techniques. The numerical simulations are performed for the 3-D flow using Fluent. The parameters (flow rate, frequency, and amplitude of oscillations) are accurately controlled using Labview. We quantify, numerically and experimentally, the degree of mixing achieved using the Mixing Variance Coefficient (MVC). We present some flow properties, optimization of the mixing for the parameters mentioned above and some biological applications.

Carl Meinhart
University of California Santa Barbara

Date submitted: 08 Dec 2004 Electronic form version 1.4