Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

A maximum entropy approach to optimal mixing in a 2D pulsed source-sink flow MARK STREMLER, Vanderbilt University, BARATUNDE COLA, Purdue University — Fluid mixing in a Hele–Shaw cell can be accomplished by periodically pulsing pairs of sources and sinks. The mixing efficiency of this system depends largely on the volume of fluid that is injected (and extracted) during each pulse. Here a two-dimensional potential flow model is used to find the pulse volumes that optimize mixing in a rectangular domain containing two source–sink pairs, a system of current interest for DNA microarray analysis. Optimal mixing protocols are identified by determining maximum entropy using an analysis of chaotic advection.

Mark Stremler
Vanderbilt University

Date submitted: 15 Aug 2005 Electronic form version 1.4