Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Entropy and Multifractal Dimensions of Complex Structures in Microchannel Mixing MIRON KAUFMAN, PETRU S. FODOR, ROBERT WHITE, Cleveland State Univ — Since the fluid flow is microchannels is laminar, mixing of advected particles is achieved by using patterns on the walls. We solve numerically the Navier-Stokes equations describing flows in patterned microchannel: the staggered herring bone which consists of periodic groves and ridges distributed along the channel length and a fractal microchannel where by employing a Weierstrass function we generate a non-periodic pattern of ridges on the channel bottom. We analyze the advection of light particles carried by a creeping flow in those channels. The quality of the mixing between two types of tracers is determined by using Shannon-Renyi entropic measures and fractal dimensions of Poincare plots along the channels. We find that the various geometric measures of mixing do not depend strongly on the different type of image file.

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Date submitted: 21 Jun 2017 Electronic form version 1.4