1125-76-2708 **Manuchehr Aminian** (aminian@live.unc.edu), **Francesca Bernardi*** (bernardi@live.unc.edu), **Roberto Camassa** (camassa@amath.unc.edu), **Daniel M. Harris** (dmh@email.unc.edu) and **Richard M. McLaughlin** (rmm@email.unc.edu). *Tailoring Tails in Taylor Dispersion: How Boundaries Shape Chemical Deliveries in Microfluidics.* Preliminary report.

We present the results of a combined computational, theoretical and experimental study of the dispersion of a passive scalar in laminar shear flow through rectangular and elliptical channels. We show through Monte Carlo simulation, asymptotic analysis and experiments that the cross-sectional aspect ratio sets the sign of the average skewness at long times (relative to the Taylor diffusion timescale) which describes the longitudinal asymmetry of the tracer distribution. Universally, thin channels (aspect ratio $\ll 1$) result in negative average skewness, whereas thick channels (aspect ratio ~ 1) result in positive average skewness. Our analysis also allows us to define a "golden" aspect ratio which separates thin from thick channels, the value of which is remarkably similar for both the rectangle and the ellipse. Further, by examining the median of the cross-sectionally averaged distribution, we establish that negative skewness correlates with solutes arriving with sharp fronts followed by a tapering tail. The experimental results are in strong agreement with our theoretical and numerical predictions. Future directions and potential microfluidic applications will be discussed. (Received September 20, 2016)