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Richard M. McLaughlin* (rmm@eailu.nc.edu), CB 3250, Phillips Hall, UNC Chapel Hill, Chapel Hill, NC 27599, and **Manuchehr Aminian, Francesca Bernardi, Roberto Camassa** and **Daniel M. Harris**. *How boundaries shape chemical delivery in microfluidics*.

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 laboratory 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 result in negative average skewness, whereas as thick channels 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. Future directions will be discussed. (Received January 16, 2017)