

supplementary material

Flow dynamics and analyte transfer in a microfluidic device for spatial two-dimensional separations

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SM-1 Calculations

Moments analysis was used to evaluate the performance of the simulations. Moments are quantitative measures related to peak shape. The zeroth moment describes the sample mass or peak area, the first moment corresponds to the mean retention time, the second moment quantifies the peak width or column efficiency, and the third moment represents the peak asymmetry (skewness). In this study, the main focus will be on the first and second moments. The peak area was calculated using the trapezoidal rule with a delta of 0.05. These moments are calculated as follows μ_1 is the first moment and μ_2 is the second moment. x is the eluted volume or flow time and c is the concentration.

$$\mu_0 = \int_0^{\infty} c(x) dx$$

$$\mu_1 = \frac{\int_0^{\infty} x c(x) dx}{\mu(0)}$$

$$\mu_2 = \frac{\int_0^{\infty} x^2 c(x) dx}{\mu(0)} - \mu_1^2$$

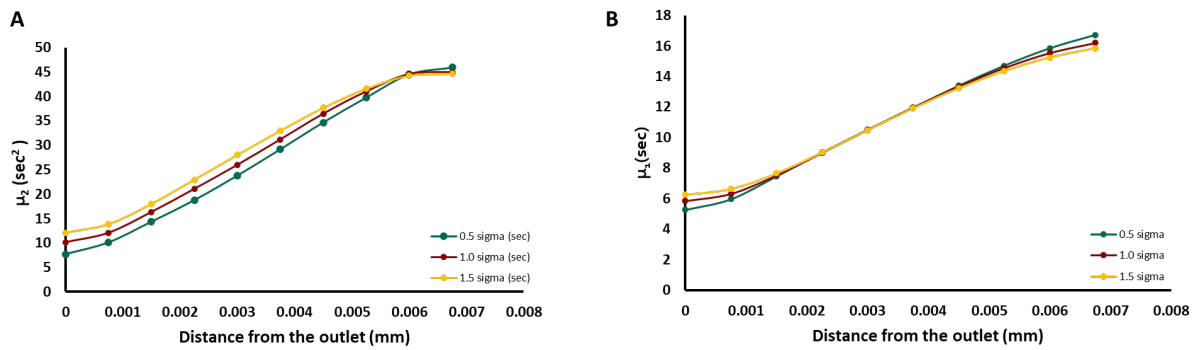


Figure S1 Calculated moment analysis from various sigma values. A) second moment, B) first moment

SM-4.2 Effect of the flow confinement

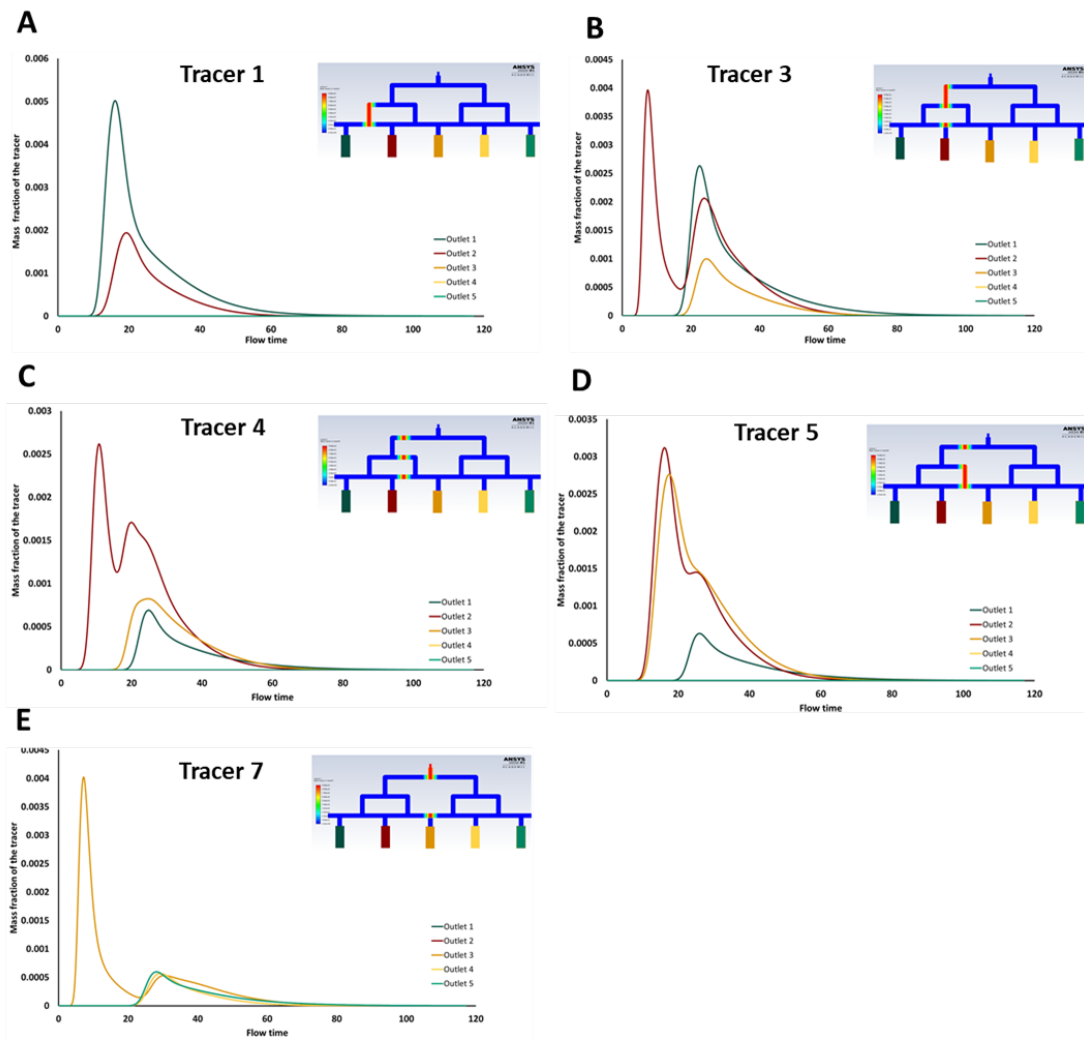


Figure S2 The tracer profiles for a single analyte in various positions in the channels