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Tuning particle focusing in inertial microfluidic devices KAITLYN HOOD, SOROUSH KAHKESHANI, DINO DI CARLO, MARCUS ROPER, Univ of California - Los Angeles — Particles in microfluidic devices at finite Reynolds number are subject to two forces: (i) inertial focusing and (ii) particle-particle interactions. Although microfluidic chips exploit these forces to manipulate particles for particle/cell sorting and high throughput flow cytometry, the forces are not understood well enough to allow rational design of devices that can tune and attenuate particle focusing. We present a mathematical model addressing both inertial focusing and particle interactions, and we apply our model to various channel geometries to determine the balance of forces. In addition, we present experimental data that illustrate the accuracy of our model. We will address the following questions: Why do high aspect ratio channels favor two equilibrium positions? Why do particle chains form?

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