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Inertial Migration and Focusing of particles in a Porous Microchannel MIKE GARCIA, SUMITA PENNATHUR, UCSB — The behavior of confined particles at high Reynolds number allows for potential advances in separation and concentration of particles. Although researchers can differentiate the location of inertially focused particles based on their size, the variability in size amongst bioparticles is often a limiting factor for viable applications. In this work, we numerically investigate a method to actively tune the focusing location of particles and thereby overcome this limitation. We show that a transverse flow due to a porous wall in a straight microchannel can precisely tune the equilibrium location of particles. For channel Reynolds number below 200, our studies show that the focusing location of spherical particles is described by a single parameter *i.e.*, the ratio between transverse drag and inertial lift forces. At positive values of this parameter, the equilibrium is found near the wall whereas the equilibrium is found near the centerline for negative values. Additionally, we demonstrate that under certain conditions the state of the equilibrium location (stable vs. unstable) can change at a critical value of this parameter. The insight gained through this study can be applied in the design of novel separation techniques, where *in situ* manipulations of particles are needed.

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