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inFocus: Fast Inertial Lift Velocity Calculation In Arbitrary Geometry[1] SAMUEL CHRISTENSEN, grad student at UCLA, RAYMOND CHU, undergrad at UCLA, CHRIS ANDERSON, MARCUS ROPER, Professor at UCLA — Inertial microfluidic devices use inertial lift forces to arrange particles into required positions and formations. However, fully realized three dimensional simulations of inertial focusing require long computation times, making predictive device design very difficult. Here we use a combination of asymptotic methods and computational fluid dynamics to develop a fast, open-source fluid flow solver in Matlab that calculates particle dynamics in channels with arbitrary geometry. We use the new solver to dissect the contributions of shear and wall curvature to particle focusing with the goal of developing mechanistic understanding of how, where, and with what speed particles focus under inertial forces.

[1]NSF

Samuel Christensen
UCLA

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