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Mesoscopic Simulations of Microfluidic Flow in Irregular Geometries TYLER N. SHENDRUK, GARY W. SLATER, University of Ottawa — Stochastic Rotation Dynamics, a particle-based model for mesoscopic fluid dynamics, is used to study two and three-dimensional flow in a variety of complex boundaries and for a range of low Reynolds numbers (between 10 and 200). The systems considered are of two types: they consist of either irregular geometries such as dimpled pipes or require adaptive boundary conditions such as particle impact on a solid boundary. We apply out techniques to microfluidic devices with complex channel walls such as those used for slalom chromatography and sinusoidal undulation surface patterning chromatography. Numerical results showing good agreement with experimental data and previous computational simulations are presented.

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