Modeling & Simulation of Complex/Particulate Fluids

Shape-based Micro/Nanoparticle Separation

- Develop theoretical/numerical model for field-flow fractionation and microfluidic device based on the dynamics on nonspherical ellipsoidal particle

Rheological Model for Polymer Melts/Solutions

- Predicts rheological properties and flow bahviors of monodisperse and polydisperse linear entangled polymer more accurately in high deformation regime
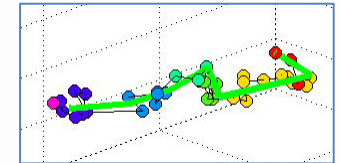
CFD Simulation of Non-Newtonian Fluids in Complex Geometries and Boundary conditions

- Viscoelastic fluids in microfluidic device under oscillatory force fields
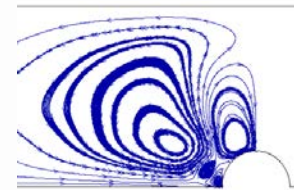- Thixotropic/Yield-stress fluids
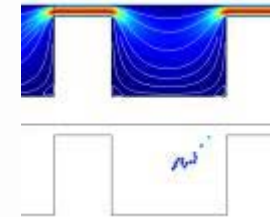
Model for Shape-based Particle Separation
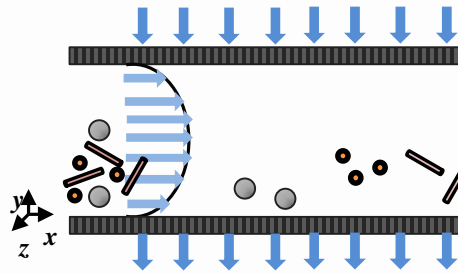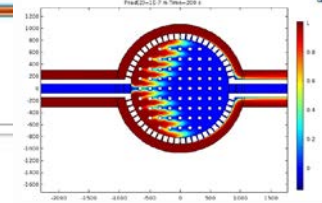

Model for Entangled Polymer under a Strong Shear Flow

CFD of Complex Fluids in Complex Flow fields

Oscillatory Viscoelastic Flow

DNA Separation in Microfluidic Device

Drug Delivery Particle Transport

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Keywords

- Shape-based particle separation, field-flow fractionation, entangled polymer, rheology, rod-like particle dynamics, microfluidic device, acoustic streaming, CFD, viscoelastic fluid, yield stress fluid

Recognitions

- KIChE Young Investigator Awards 2016
- Ray W Fahien Teaching Awards 2008

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