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Effect of Shear on Electrohydrodynamic-Driven Suspension of Bubbles[1] MARRIVADA REDDY, ASGHAR ESMAEELI, Southern Illinois University at Carbondale — When a bubble with a certain dielectric properties, is suspended in a fluid with different dielectric properties, and is immersed in a uniform electric field, it will experience surface deformation and flow circulation. The direction of the circulation and the sense of the surface deformation depend on the relative importance of the electric conductivity ratio and the permittivity ratios of the bubble and suspending fluid. These effects play a major role in the microstructure formation of suspension of bubbles. In the case of bubbles moving near the wall, the velocity gradient will also influence the motion. To explore the effect of velocity gradient on the pattern formation, we impose a shear force on the electrohydrodynamic-driven suspension of bubbles. We use a front tracking/finite difference method to solve the momentum and "leaky-dielectric" electrohydrodynamic equations. Dynamics of binary- and multi-bubble interactions will be studied as a function of different shear rates.

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