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Effect of The Viscosity Ratio on Equilibrium Shapes and Instability of Liquid Drops in Electric Field ASGHAR ESMAEELI, Southern IL Univ-Carbondale — Electrohydrodynamics of liquid drops is currently the focus of increased attention because of its relevance in a host of processes such as micro- and bio-fluidics. In a weak electric field the drop acquires an equilibrium shape, deforming to an oblate or a prolate spheroid. However, beyond a critical electric field strength it will disintegrate through tip-streaming or bulbous breakup. The modes and mechanisms of drop disintegration has been reasonably well-studied, assuming the drop viscosity to be the same as that of the ambient. However, there are some evidences that suggest the viscosity ratio can dramatically affect the dynamics, even leading to new breakup modes. The goal of this study is to provide further insight regarding this issue through computational simulations. To this end, we use a front tracking/finite difference scheme in conjunction with Taylor leaky-dielectric model to solve the governing electrohydrodynamic equations

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