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Dynamics of a surfactant-covered viscous drop under an electric field: Effects of surfactant diffusivity HERVE NGANGUIA, ON SHUN PAK, Santa Clara University, YUAN-NAN YOUNG, New Jersey Institute of Technology — Electrohydrodynamics of a viscous drop covered with surfactants is highly relevant in many industrial applications. Previously we have used a leaky dielectric model to investigate the deformation of a spheroidal viscous drop covered with non-diffusive surfactants (**Phys. Fluids**, 25, 092106, 2013). In this work we extended the previous spheroidal model to both dielectric and conducting drop covered with diffusive surfactants. We propose spheroidal models of leaky and conducting drops in electric field for both small and intermediate deformations. We further couple the models to surfactant dynamics, and investigate the effects of varying surfactant concentrations and Péclet numbers on deformation. We conclude with a discussion and extensions to the process of electro-coalescence.

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