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**Particle-particle Interactions on the Surface of a Drop Subjected to a Uniform Electric Field** SAI NUDURUPATI, MANSOOR JANJUA, Lake Superior State University, PUSHPENDRA SINGH, New Jersey Institute of Technology, NADINE AUBRY, Carnegie Mellon University — We recently proposed a technique in which an externally applied uniform electric field was used to alter the distribution of particles on the surface of a drop immersed in another immiscible liquid. Particles move along the drop surface to form a ring near the drop equator or collect at the poles depending on their dielectric constant relative to that of the two liquid involved. This motion is due to the dielectrophoretic force that acts upon particles because the electric field on the surface of the drop is non-uniform, despite the fact that the applied electric field is uniform. This technique could be useful to concentrate particles at a drop surface, and also separate two types of particles. In this talk we show that in addition to the dielectrophoretic force the particles also interact with each other via the dipole-dipole interactions to form chains or move away from each other depending on the local direction of the electric field. The regions in which the local electric field is normal to the drop surface (poles), particles move away from each other. On the other hand, where the local direction of electric field is tangential to the drops surface (equator), they form chains that are aligned parallel to the electric field direction.

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