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On the evolution of electrically charged toroidal droplets ALEXANDROS FRAGKOPOULOS, EKAPOP PAIRAM, ALBERTO FERNANDEZ-NIEVES, Georgia Institute of Technology — We can successfully generate viscous toroidal droplets suspended in another immiscible viscous liquid. Toroidal droplets are unstable due to surface tension and either break via a hydrodynamic instability similar to Rayleigh-Plateau or shrink until they collapse into a single spherical droplet. By applying a voltage difference across the droplet and a controlled ground we are able to charge the toroidal droplets. As a result, the surface tension now is in competition with the electrostatic repulsion due to the presence of the charge; this can change the evolution of the torus significantly. For instance, it can cause the expansion of the torus rather than its shrinkage, and also affects the wavelength of the fastest unstable mode.

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