

Abstract Submitted
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Electrostatic drops in orbit¹ ISABEL J. RODRIGUEZ, ERIN SCHMIDT, MARK M. WEISLOGEL, Portland State Univ, DONALD PETTIT, NASA Johnson Space Center — We present what we think are the first intentional electrostatic orbits in the near-weightless environment of a drop tower. Classical physics problems involving Coulombic forces in orbital mechanics have traditionally been confined to thought experiments due to practical terrestrial experimental limitations, namely, the preponderance of gravity. However, the use of a drop tower as an experimental platform can overcome this challenge for brief periods. We demonstrate methanol-water droplets in orbit around a variety of charged objects- some of which can be used to validate special cases of N-body systems. Footage collected via a high-speed camera is analyzed and orbital trajectories are compared with existing theoretical predictions. Droplets of diameters 0.5 to 2mm in a variety of orbits are observed. Due to the repeatability of drop tower initial conditions and effective low-g environment, such experiments may be used to construct empirical analogues and confirm analyses toward the benefit of other fields including space and planetary science.

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