

Abstract Submitted
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A Novel Approach to the Millikan Oil Drop Experiment SPENCER GIBBS, APS- Bellevue Community College, NOMIN OYUN, Bellevue Community College, BELLEVUE COMMUNITY COLLEGE TEAM — Robert Millikan was in part awarded the 1923 Nobel Prize in physics for the famous Millikan Oil Drop Experiment. We have successfully repeated the experiment using a novel approach designed by Brian Scott and Robert Hobbs of Bellevue Community College that is less tedious and more reliable than the classic experiment. In Millikan's experiment, the charged plates are oriented horizontally so that the electric and gravitational forces are parallel to each other. By observing the velocity of the droplets in the field free state, the mass of the droplet can be determined, and by observing the velocity in the electric field, the charge can be inferred. Bellevue College's new approach reorients the plates vertically so that the gravitational field is perpendicular to the electric field. We have also added video capture of the falling drop to replace the traditional repeated rise and fall timings from the original. This allows both the mass and charge of the droplet to be determined in one passage from the orthogonal components of velocity, dramatically improving the ease and success rate of the experiment. Using this method, it is well within the experimental abilities of first year physics students to successfully determine the mass and charge of the oil droplets.

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