

Abstract Submitted
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Electric Field Response of Highly Magnetized Ultracold Plasma Electrons¹ JOHN GUTHRIE, PUCHANG JIANG, JACOB ROBERTS, Colorado State University — Through their cold temperatures, ultracold plasma electrons can be highly magnetized with laboratory-scale magnetic fields. We have created ultracold plasmas in such a highly magnetized regime where the Larmor radius of the electron motion is the shortest relevant plasma length scale for the electrons. Short electric field pulses can be used to excite electron oscillations and drive electron escape from these ultracold plasmas. This oscillation motion can be used to determine the electron-ion collision rate in this highly magnetized regime. There are experimental complications in analyzing the electron response to such short pulses in magnetized ultracold plasmas, however. We describe these limitations and their resolution as well as presenting the measurement techniques used for determining the electron-ion collision rate.

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