

Abstract Submitted  
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**Measurement of strong coupling influences on the electron-ion collision rate in an ultracold plasma**<sup>1</sup> JACOB ROBERTS, WEI-TING CHEN, CRAIG WITTE, Colorado State University — We have experimentally measured electron oscillation damping rates in ultracold plasmas formed with a minimal (less than 10  $\mu\text{eV}$ ) initial kinetic energy. Under our conditions, the oscillation damping rate is predicted to be dominated by electron-ion collisions and so the measuring the damping rate provides a measure of the electron-ion collision rate. Strong coupling effects are expected to be relevant for these conditions, and indeed we observe a damping rate over a factor of 3 larger than the rate obtained assuming weak coupling. We compare our measurements with theoretical predictions derived from other theories that extend processes such as electron-ion temperature equilibration and stopping power to parameters with significant strong coupling. Simple extensions of these theories do not match our measurements, with implications for the applicability of standard collision approximations that are often used.

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