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Off-resonant radiofrequency heating of ultracold plasmas with weakly and extremely magnetized electrons[1] JOHN GUTHRIE, PUCHANG JIANG, JACOB ROBERTS, Colorado State University — We have developed an experimental technique to measure the electron temperature increase in ultracold plasmas caused by off-resonant radiofrequency (RF) heating. This heating rate is determined by electron-ion interactions and so can be used to test theories that predict the strength of those interactions. These measurements have been conducted at both low (weak) and high (extreme) degrees of electron magnetization to measure the impact of magnetization on electron-ion interactions. Despite applying strong enough magnetic fields that the electron gyroradius was the dominant length scale in the system, the RF heating rate was unaffected at the 20% precision level. These experimental results can be used to determine the magnetic field dependence of required cutoff parameters in linear response theories.

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