

Abstract Submitted
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Measurement of Rydberg atom formation in low-density ultracold neutral plasmas¹ WEI-TING CHEN, CRAIG WITTE, JACOB ROBERTS, Colorado State University — Rydberg atoms are formed in ultracold neutral plasmas primarily through three-body recombination for typical experimental conditions. At low densities the relative importance of electron-Rydberg state-changing collisions in the dynamical evolution of the Rydberg atom state populations is increased, leading to temperature scalings significantly different from the usual $T^{-9/2}$ scaling associated with the three-body recombination rate. We report our measurement of Rydberg atoms in low-density ultracold neutral plasmas and discuss their utility in calibrating the electron temperature and determining the amount of heating due to continuum lowering that occurs during the formation of the ultracold plasma.

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