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Continuum considerations for Rydberg atom formation in low-density ultracold neutral plasmas[1] WEI-TING CHEN, 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 increases, leading to temperature scalings different from the usual $T^{-9/2}$ scaling associated with the three-body recombination rate. We report our measurement of Rydberg atom formation rates in low-density ultracold neutral plasmas. We also discuss continuum considerations in the calculation of the three-body recombination rate and its relation to our observations.

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