

Abstract Submitted  
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**Ion holes in the crossover between hydrodynamic and kinetic regimes, in an ultracold neutral plasma**<sup>1</sup> PATRICK MCQUILLEN, TREVOR STRICKLER, THOMAS LANGIN, THOMAS KILLIAN, Rice University Department of Physics and Astronomy & Rice Quantum Institute — Localized ion density depletions or ion holes are interesting and important in a variety of plasma systems from space plasmas to high energy density plasmas and can be sensitive to nonlinear as well as kinetic effects. Ultracold neutral plasmas (UNPs) provide an excellent test bed for such phenomena thanks to their controllability and clean diagnostics. For this study we will explore the transitional regime between hydrodynamic and kinetic ion holes, with emphasis on collisional dynamics and stopping power. We will also present measurements of ion temperature evolution for a traditional UNP and the effect of passing ion holes.

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