

Abstract Submitted
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Disorder-induced heating and early time dynamics in ultracold neutral plasmas MARY LYON, SCOTT BERGESON, Brigham Young University, FRANCIS ROBICHEAUX, Auburn University — Disorder-induced heating (DIH) is a nonequilibrium, ultrafast relaxation process that occurs when laser-cooled atoms are photo-ionized to make an ultracold plasma. Its effects dominate the ion motion during the first 100 ns of the plasma evolution. We measure DIH using laser-induced fluorescence on the ions. By changing the frequency of the probe laser beam we map out the time evolution of the velocity distribution with ns time resolution. We compare to a fluorescence simulation to more clearly determine the relationship between the fluorescence signal and the velocity distribution. This allows us to characterize ion heating and (quasi-)equilibration in a wide range of plasma conditions.

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