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Electron Screening and Early Dynamics of Ultracold Neutral Plasmas ADAM DENNING, SCOTT BERGESON, Brigham Young University — We study how the early electron screening dynamics of ultracold neutral plasmas varies with density and temperature. Calcium atoms are cooled and captured in a magneto optical trap where they are ionized to form a plasma. We measure laserinduced fluorescence from the calcium ions as the plasma evolves. At high densities we see evidence of strong screening for all temperatures. At lower densities, the ions appear to interact on time scales that are shorter than the ion plasma frequency. The mechanism for such an interaction time scale is not known. However, it appears to depend on the initial electron temperature in the ultracold neutral plasma.

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