Abstract Submitted
for the DAMOP06 Meeting of
The American Physical Society

Probing the momenta of Stark eigenstates J. MURRAY-KREZAN, R. R. JONES, Department of Physics, University of Virginia — Approximate momentum distributions of Rydberg electrons in static electric fields have been obtained using an improved Impulse Momentum Retrieval (IMR)technique. An imaging detector enables the measurement of half-cycle pulse (HCP) ionization probability across the spatial profile of a focused HCP beam. By modulating the HCP amplitude [Zeibel and Jones, Phys. Rev. A **68**, 023410 (2003)], we directly measure the derivative of the ionization vs. HCP impulse curve, enabling the recovery of momentum distributions with finer resolution than previously attainable. For example, for Stark states with nearly zero dipole moments, we observe a notch in the projection of the momentum distribution along the Stark field axis. We have developed a semi-classical method for simulating the effect that the finite HCP duration has on our measurements. Reasonable agreeement between simulated and measured momentum distributions is obtained. This work has been supported by the AFOSR and the NSF.

Robert R. Jones
Department of Physics, University of Virginia

Date submitted: 27 Jan 2006 Electronic form version 1.4