

Abstract Submitted
for the DAMOP14 Meeting of
The American Physical Society

Characterizing high- n quasi-one-dimensional strontium Rydberg atoms¹ MORITZ HILLER², SHUHEI YOSHIDA, JOACHIM BURGDÖRFER, Institute for Theoretical Physics, Vienna University of Technology, SHUZHEN YE, XINYUE ZHANG, F. BARRY DUNNING, Department of Physics and Astronomy, Rice University — The production of high- n , $n \sim 300$, quasi-one-dimensional strontium Rydberg atoms by two-photon excitation of selected extreme Stark states in the presence of a weak dc field is examined using a crossed laser-atom beam geometry. The polarization of the product states is probed using three independent techniques which are analyzed with the aid of classical-trajectory Monte Carlo simulations that employ initial ensembles based on quantum calculations using a two-active-electron model. Comparisons between theory and experiment demonstrate that the product states have large dipole moments, $\sim 1.0 - 1.2n^2 a.u.$ and that they can be engineered using pulsed electric fields to create a wide variety of target states.

¹Research supported by the NSF, the Robert A Welch Foundation, and the FWF (Austria).

²also affiliated with Physikalisches Institut, Albert-Ludwigs-Universität Freiberg

Xinyue Zhang
Rice Univ

Date submitted: 28 Jan 2014

Electronic form version 1.4