

Abstract Submitted
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Production of very-high- n Rydberg atoms in an optical dipole trap¹ S.K. KANUNGO, R. DING, J.D. WHALEN, F.B. DUNNING, T.C. KILLIAN, Rice University — Very-high- n ($n \geq 300$), Rydberg states can be manipulated with remarkable precision using carefully-tailored series of electric field pulses which enables control of their interactions. High- n states, however, are strongly perturbed by stray fields which must therefore be reduced to very small levels. Whereas selective excitation to states with $n > 500$ has been achieved using large, closed electrode geometries, the optical access required to generate cold atom samples precludes the use of similar geometries. We will describe progress towards nulling the stray electric fields in an apparatus capable of producing quantum degenerate Strontium gases by utilizing Stark spectroscopy and application of small offset potentials to two sets of nearby electrodes. Methods that might be used to automate this process are also being explored.

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