

Abstract Submitted
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Creation of non-dispersive Bohr-like wave packets JEFF MESTAYER, B. WYKER, F.B. DUNNING, Rice University, C.O. REINHOLD, Physics Division, Oak Ridge National Laboratory, S. YOSHIDA, J. BURGDÖRFER, Vienna University of Technology — We demonstrate the use of a periodic train of half-cycle pulses to create strongly-localized non-dispersive wave packets in very-high- n ($n \sim 300$) Rydberg atoms that travel in near-circular orbits about the nucleus. This motion can be maintained for hundreds of orbital periods mimicking the original Bohr model of the hydrogen atom which envisioned an electron in circular classical orbit about the nucleus. The conditions for formation of non-dispersive Bohr-like wave packets are discussed with the aid of Classical Trajectory Monte Carlo (CTMC) simulations and demonstrated through experiment. Research supported by the NSF, the Robert A. Welch Foundation, the OBES, U.S. DoE to ORNL, and by the FWF (Austria).

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