

Abstract Submitted
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Nondispersing Bohr wave packets using circularly polarized microwave fields HARUKA MAEDA, PRESTO, Japan Science and Technology Agency, JOSHUA GURIAN, THOMAS GALLAGHER, University of Virginia — It is possible to make nondispersing Bohr wave packets in a straightforward way starting from Li Rydberg atoms in an np eigenstate. These atoms are first exposed to a linearly polarized microwave field at the orbital frequency, 17.6 GHz at $n=72$. The linearly polarized field phase locks the electron wave packet to the microwave phase, making a nondispersing wave packet in which the electron oscillates in a highly eccentric, approximately linear orbit. We detect the phase locked motion of the electron with a 1/2 ps half-cycle pulse synchronized with the microwave field. Slowly changing the microwave polarization from linear to circular polarization creates a nondispersing Bohr wave packet that survives for thousands of orbits. This work is supported by the National Science Foundation.

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