

Abstract Submitted
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Controlling a single atom trapped in a ring-shaped potential LU ZHAO, TUN WANG, SUSANNE YELIN, University of Connecticut — One alkali atom is trapped tightly in a ring-shaped potential formed by two strong far detuned evanescent waves close to a dielectric surface. Two copropagating Laguerre-Gaussian Raman beams are applied to control the rotational quantum states of the atom in the ring. We show that the orbital angular momentum of photons can be transferred to the atom to produce a coherent coupling between different rotational quantum states. This system can be applied, for example, in quantum information processing.

Susanne Yelin
University of Connecticut

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