

Abstract Submitted
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Cold atom confinement in hollow laser beams with high charge number FREDRIK FATEMI, MARK BASHKANSKY, NRL — We investigate experimentally and numerically the focusing properties of hollow laser beams suitable for cold atom confinement, and use these properties to confine atoms in a blue-detuned optical trap. A Gaussian beam modified by a spatial light modulator to have an azimuthally varying phase $\exp(in\phi)$ creates a hollow laser beam with charge number n . When focused through an imaging lens, these hollow beams are found to attain peak intensity farther from the focal plane as n is increased. We demonstrate the properties of these beams by confining atoms in a box potential with steep intensity walls formed by crossed blue-detuned hollow beams with high charge number.

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