

Abstract Submitted
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Cold Atom Manipulation with Off-Axis Rotating Trap EUN OH, US Naval Research Laboratory, JINWEI WU, Interferometrics, Inc., FRANK MOSCATELLI, Swarthmore College, SHENGWANG DU, Edward L. Ginzton Laboratory, Stanford University — We have investigated the theory governing the behavior of atoms in various off-axis rotating traps in the presence of damping forces. When the radius of rotation of the trap is within the trap volume, the atoms are attracted towards the rotating origin if the damping rate Γ is larger than the trap frequency ω (i.e., $\Gamma > \omega$). This is as opposed to being repelled by the centrifugal force in the rotating accelerated reference frame. On the other hand, when the trap's rotation radius is larger than the trap size, the drag velocity of the atoms decrease with increasing rotational frequency. These anomalous properties can be used to realize high speed rotating sensors and static effective ring trap potentials for manipulating cold atoms.

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