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Piezoelectrically-actuated time-averaged atomic microtraps

Adam D. West, Christopher G. Wade, Kevin J. Weatherill, Ifan G. Hughes

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We present a scheme for creating tight and adiabatic time-averaged atom-traps through the piezoelectric actuation of nanomagnetic structures. We show that potentials formed by the circular translation of magnetic structures have several advantages over conventional rotating-field techniques, particularly for high trap frequencies. As the magnitude of the actuation is changed the trapping potential can be changed adiabatically between harmonic 3D confinement and a toroidal trap.

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