

Abstract Submitted
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Retardation effects in induced atomic dipole-dipole interactions

SEAN GRAHAM, JEFFREY MCGUIRK, Simon Fraser University — We present mean-field calculations of azimuthally averaged retarded dipole-dipole interactions in a Bose-Einstein condensate induced by a laser, at both long and short wavelengths. Our calculations demonstrate that dipole-dipole interactions become significantly stronger at shorter wavelengths, by as much as 30-fold, due to retardation effects. This enhancement, along with the inclusion of the dynamic polarizability, indicate a method of inducing long-range interatomic interactions in neutral atom condensates at significantly lower intensities than previously realized.

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