Quantum Physics

Elimination of the Diffraction of Arbitrary Images Imprinted on Slow Light

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We present a scheme for eliminating the optical diffraction of slow-light in a thermal atomic medium of electromagnetically induced transparency. Nondiffraction is achieved for an arbitrary paraxial image by manipulating the susceptibility in momentum space, in contrast to the common approach, which employs guidance of specific modes by manipulating the susceptibility in real space. For negative two-photon detuning, the moving atoms drag the transverse momentum components unequally, resulting in a Doppler trapping of light by atoms in two dimensions.

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