

Quantum Physics

Far-off resonance conditional phase-shifter using the ac-Stark shift

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We propose a simple technique that achieves a conditional phase shift of pi radians between two weak lasers with energies at the 1000-photon level. The key idea is to set up a V-system with two far-off resonant lasers by coupling the ground state to two excited electronic states. The lasers interact through the ac Stark shift of the ground state and thereby acquire a large conditional phase shift.

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