PHYSICAL REVIEW A

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Erratum: Ultrafast population transfer in three-level Λ systems driven by few-cycle laser pulses [Phys. Rev. A **64**, 065402 (2001)] *(1 page)* . . . . . 039903(E)
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Publisher's Note: Analysis of a quantum memory for photons based on controlled reversible inhomogeneous broadening [Phys. Rev. A **75**, 032327 (2007)] *(1 page)* . . . . . 039904(E)
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