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Publisher's Note: Effect of time-dependent ionization on the propagation of a few-cycle laser pulse in a two-level medium [Phys. Rev. A **72**, 043820 (2005)] *(1 page)* . . . . . 059904(E)
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Erratum: Four-photon entanglement from two-crystal geometry [Phys. Rev. A **69**, 020302 (2004)] *(1 page)* . . . . . 059905(E)
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Publisher's Note: Multiparticle entanglement under asymptotic positive-partial-transpose-preserving operations [Phys. Rev. **72**, 042325 (2005)] *(1 page)* . . . . . 059907(E)
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