PHYSICAL REVIEW A

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ERRATA

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Publisher's Note: Quantum nondemolition measurements for quantum information [Phys. Rev. A **73**, 012113 (2006)] *(1 page)* . . . . . 039902(E)
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Erratum: Engineering vortex rings and systems for controlled studies of vortex interactions in Bose-Einstein condensates [Phys. Rev. A **72**, 063626 (2005)] *(1 page)* . . . . . 039905(E)
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