

Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Toward perfect homodyne detection of twin vacuum beams TIAN LI, TRAVIS HORROM, BRIAN ANDERSON, Joint Quantum Institute, National Institute of Standards and Technology and the University of Maryland, College Park, MD 20742, USA, PAUL LETT, Quantum Measurement Division, National Institute of Standards and Technology and Joint Quantum Institute, NIST and UMD, Gaithersburg, MD 20899, USA — We demonstrate the use of an optical phase-sensitive amplifier to recover the quantum correlations in twin light beams after degradation due to optical loss and detector efficiency. We use four-wave mixing in hot ^{85}Rb vapor cell to generate correlated twin beams in a two-mode squeezed vacuum state. We then use a second four-wave mixing cell as our optical phase-sensitive amplifier to amplify one half of the two-mode state, which can compensate for downstream optical loss and restore the nonclassical correlations of the state.

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Date submitted: 29 Jan 2016

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