

Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Generation of Narrowband Bright Single-Mode Squeezed Light through Feedforward¹ SAESUN KIM, ALBERTO M. MARINO, University of Oklahoma — Squeezed states of light have received renewed attention recently due to their applicability to quantum-enhanced sensing. In order to take full advantage of the reduced noise properties of squeezed light to enhance sensors based on atomic systems, such as atomic magnetometers and atomic interferometers, it is necessary to generate near or on atomic resonance single-mode squeezed states of light. We have previously generated bright two-mode squeezed states of light, or twin beams, that can be tuned to resonance with the D1 line of ⁸⁷Rb with a nondegenerate four-wave mixing (FWM) process in a double-lambda configuration in a ⁸⁵Rb vapor cell. Here we report on the use of feedforward to transfer the intensity quantum correlations present in the twin beams to a single beam for the generation single-mode squeezed light. Through the use of this technique, we obtained a single-mode squeezed state with an intensity squeezing level of 2.9 dB when the FWM is tuned off-resonance and a level of 2.1 dB when it is tuned on resonance with the D1 $F = 2$ to $F = 2$ transition of ⁸⁷Rb.

¹Work supported by a grant from AFOSR (FA9550-15-1-0402)

Saesun Kim
University of Oklahoma

Date submitted: 04 Feb 2019

Electronic form version 1.4