Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Quantum-enhanced Spectroscopy Using Squeezed Light on Raman Two-Photon Absorption[1] NIKUNJKUMAR PRAJAPATI, ZIQI NIU, IRINA NOVIKOVA, William Mary, WILLLIAM MARY GROUP TEAM — We investigate the possibility to extend the applicability of two-mode intensity squeezed twin beams to improve the sensitivity of the weak absorption measurements to different optical frequencies using Raman two-photon absorption resonances. Normally, the twin beams can be used to achieve the sub-shot noise sensitivity only for the narrow spectral range determined by the FWM gain line. By using a strong pump field to connect one of the squeezed beams to desired higher excited state, and then performing the usual differential measurements, it becomes possible to measure various characteristics of very weak transitions with sub-shot noise precision. We conduct proof-of-principle demonstration using spectroscopy of 5D states of Rb.

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Date submitted: 02 Feb 2020 Electronic form version 1.4