

Joint Seminar – CQSE, CTP, & CASTS

2019
Oct. 18, Friday

TIME Oct. 18, 2019, 2:30~3:30pm
TITLE Squeezed light generation based on coherent interactions
between light and atoms
SPEAKER Dr. You-Lin Chuang
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PLACE Rm716, CCMS & New Physics Building, NTU

Abstract

The generation of the quantum state of light with the reduction of quadrature variance below standard vacuum noise using coherent interactions between light and atomic ensemble will be discussed in this talk. With the slow-light propagation in high optical density (OD) coherent population trapping (CPT) atomic media, the high degree squeezing of a pair of two light fields can be efficiently produced from coherent state inputs. Our study reveals that noise squeezing of more than 10dB can be achieved with an OD of 1,000. A large OD facilitates to increase the degree of squeezing. In addition, the input intensity and two-photon detuning are two key factors in output quadrature variance, but whose minimum values are insensitive to the two factors, showing the proposed scheme is flexible and robust. The enhancement of quantum squeezing of light with high OD in CPT system opens an alternative avenue in quantum optics and coherent control media.

