

Joint CQSE and CASTS Seminar

2018
Oct. 26, Friday

TIME Oct. 26, 2018, 14:30 ~ 15:30
TITLE Generation of Continuous-Variable Quantum Entanglement
based on Electromagnetically Induced Transparency Media
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Abstract

The generation of two entangled optical fields from an atomic system under electromagnetically induced transparency (EIT) condition has been studied. With solving atom-field coupled equations in fully quantum mechanical way, we can find that the condition of continuous-variable entanglement between two output fields is satisfied, even though the two fields are independent initially. Besides, we have shown that the generated entanglement can be controlled by some tunable physical parameters in EIT system, which are optical density of atomic ensemble, two-photon detuning, and relative Rabi frequency strength between two interacting fields. By scanning the parameters, we find the best entanglement, whose degree can achieve 50% to that of ideal entangled states, and the corresponding relations between these parameters, which can be explained well in our analytical formula.

The scheme of electromagnetically induced entanglement paves a way to study the non-classical light source generation from quantum coherence, and provides great potentials in the applications of quantum information sciences.

