

Abstract Submitted
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Strongly Correlated Photons at Full Transmission¹ YAO-LUNG L. FANG, HAROLD U. BARANGER, Duke Univ — We show how to make strongly correlated photons in a fully transmitted pulse. The system consists of three-level qubits (3LS) coupled to a one-dimensional waveguide. Our two-photon scattering approach naturally connects photon correlations with inelastic scattering. We find that the total inelastically scattered flux is much larger than in the case of two-level systems, making 3LS better candidates for experimental study of non-classical light. Strikingly, there is a further substantial increase in inelastic flux upon adding either more 3LS or a mirror. Typically, resonant probe photons at electromagnetically induced transparency are not correlated — the correlations occur off resonance and so involve backscattering. Remarkably, we show that for three qubits, the qubit frequencies and the pump beam can be engineered such that correlated photons are fully transmitted, thereby greatly improving the efficiency of generating photon correlation.

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