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Electromagnetically induced transparency in 1D open space[1]
DIBYENDU ROY, Theoretical Division and Center for Nonlinear Studies, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA — We study scattering of photons from a Λ- or ladder-type three-level emitter (3LE) embedded in a 1D open waveguide. The weak probe photons in the waveguide are coupled to one of the two allowed transitions of the 3LE, and the other transition is driven by a control beam. This system shows electromagnetically induced transparency (EIT) which is accompanied with the Autler-Townes splitting (ATS) at a strong driving by the control beam, and some of these effects have been observed recently. We show that the nature of second-order coherence of the transmitted probe photons near two-photon resonance changes from bunching to antibunching to constant as strength of the control beam is ramped up from zero to a higher value where the ATS appears.

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