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(G*) Electromagnetically Induced Transparency in an Ensemble of Three-Level Lambda Systems

Wednesday 21 June 2023 14:30 (15 minutes)

We present a theoretical model of Electromagnetically Induced Transparency in an ensemble of three-level atoms that are driven by a probe and a control field in a lambda configuration. The ensemble is modelled by a 5-level quantum system with the mean-field interactions between atoms modelled by decoherence terms. The dynamics of the ensemble are calculated by solving the Lindblad Master Equation for the density matrix. From the density matrix, the polarizability and the frequency-dependence of the susceptibility are calculated. The control field induces transparency to the probe field due to interference between multiple pathways. A strong dependence on the density of the ensemble is observed.

Keyword-1

Quantum Optics

Keyword-2

EIT

Keyword-3

quantum control

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