Enhancement of Electromagnetically Induced Transparency and Absorption signal in 85Rb Atomic Vapor Medium using a Small External Magnetic Field

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Abstract:

Theoretical and experimental study of electromagnetically induced transparency (EIT) and electromagnetically induced absorption (EIA) at room temperature atomic vapor medium of 85Rb is performed in presence of small external magnetic field. We have observed switching from EIT to EIA at particular magnetic field. Dispersion profile of linearly polarized probe is observed using the circularly polarized control/coupling beam. A prototypical nine-level system for atomic transitions is solved using density matrix approach. Simulated results are in good agreement with the experimental one. This observation can have potential application towards quantum memory, quantum information, group velocity measurement, and optical switching.

Reference: