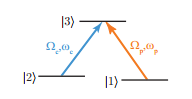
Selective Processes between Cohere Population Trapping and Raman Transition via Electromanetically-Induced Transparency

ECE 695

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Coherent population trapping (CPT) renders atoms in the ground states of a Λ-like system as shown in Figure 1 virtually irresponsive to excitation by photon. This phenomenon was predicted in the Schrödinger’s equation where in the Λ-like system two resonances were treated independently while coherence between the two ground states was established [1]. The researchers noted that the excited state population dwindles with the strong presence of the coherence between the ground states. This led to the discovery of dark resonance which dates back to as early as 1970s when researchers found out in a three-level Λ-like system coherence in two photon transitions suppresses absorption of photons [2, 3].



This phenomenon was predicted in the superposition states where

where the interaction Hamiltonian vanishes, hence yielding non-absorbing states.

[1] E. Arimondo and G. Orriols, Lett. Nuovo Cimento 17, 333 (1976)

[2] G. Alzetta, A. Gozzini, L. Moi, and G. Orriols, Nuovo Cimento 36B, 5 (1976).

[3] H. R. Gray, R. M. Whitley, and C. R. Stroud, Opt. Lett. 3, 218 (1978).