Electromagnetically Induced Absorption
Resonance Sign Reversal

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Experimental results are presented about the transformation of the electromagnetically induced absorption resonance into the electromagnetically induced transparency one. The role of the depolarization of the excited state on the $D_2$ line of Cs atoms exposed to different confinements is discussed.

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1. Introduction

The coherent population trapping (CPT) \cite{1} and related electromagnetically induced transparency (EIT) phenomena have found a large number of applications in science and technology. The degenerate two-level systems provide many possibilities for investigation of CPT. Zeeman optical pumping destroyed by magnetic field (MF) allows the observation of EIT \cite{2}, as well as electromagnetically induced absorption (EIA) \cite{3} in the atomic medium. CPT resonances prepared in the Hanle configuration have been investigated for atoms irradiated by monochromatic laser field in a way that different polarization components couple the Zeeman sublevels of single hyperfine (hf) ground level to a common excited state and introduce coherence between ground magnetic sublevels at zero value of a scanned around it magnetic field $B$, orthogonal to the orientation/alignment of atoms. As shown in \cite{3}, in absence of depolarizing collisions of the excited state, and depending on the ratio of the degeneracies of the two hf levels involved in the optical hf transition, EIT and EIA sub-natural width resonances can be observed for degenerate two-level systems. EIT is realized when the conditions $F_\text{g} \rightarrow F_\text{e} = F_\text{g} - 1$, $F_\text{g}$ are met, while EIA is observed for $F_\text{g} \rightarrow F_\text{e} = F_\text{g} + 1$. Here, $F_\text{g}$ and $F_\text{e}$ are the hf quan-

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