Abstract Submitted
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Polarization dependence of ladder-type electromagnetically induced transparency in cesium atoms[1] CHIN-CHUN TSAI, TE-HSIN CHEN, CHING-YUAN SU, THI THUY NGUYEN, HE-YI HSU, National Cheng Kung University — We present an experimental and theoretical study of Polarization dependence in a ladder-type electromagnetically induced transparency (EIT) of cesium atoms. The probe field, vertical polarization, is frequency locked at one of the dipole-allowed transitions of $6S_{1/2} \rightarrow 6P_{3/2}$ and scanning the coupling field, horizontal polarization, to access the excited state $6P_{3/2} \rightarrow 8S_{1/2}$. The transmittance of the probe laser field is monitored while the EIT occurred. To simulation the observed spectrum, Optical Bloch equation, two-photon transition probability, and optical pumping with polarization dependence are concerned and constitute in the theoretical model. Optical pumping with polarization dependence providing the population redistributes in magnetic Zeeman sublevel is a pivotal factor for fitting the experimental data. Our theoretical model properly generates the EIT intensity and line profile to fit the measured EIT spectra for all the possible hyperfine transitions in the three-level system.

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