Abstract Submitted
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Pump-probe transmission spectra in the general cases of arbitrary polarizations and powers of probe and pump beams of ^{85}Rb atom HAFEEZ REHMAN, ADNAN MUHAMMAD, Chosun University, HEUNG-RYOUL NOH, Chonnam University, JIN-TAE KIM, Chosun University — We have investigated profile variations of probe beam transmission signals from hyperfine levels between the ground 5 $S_{1/2}$ and excited 5 $P_{3/2}$ lines of ^{85}Rb atom in a vapor cell with degenerate magnetic sublevels with respect to changes of polarizations, powers, beam sizes, and directions of control and probe beams. The probe laser frequency is fixed at the F" = 3 $\rightarrow$ F' = 4 degenerate two level system of ^{85}Rb atom while the control beam is scanned through F" = 2 and 3 $\rightarrow$ F" = 1, 2, 3, and 4 hyperfine manifold. Various polarization dependent profiles in the transmission signals including EIT-like and EIA signals have been observed. The observed signal profiles are compared with signals calculated from generalized time-dependent density matrix equations considering multi-photon processes between the degenerate magnetic sublevels and match well with the calculated signal profiles.

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