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Study on EIA spectral profiles as a function of applied static magnetic field ZEESHAN JADOON, AISAR UL HASSAN, Chosun University, HEUNG-RYOUL NOH, Chonnam University, JIN-TAE KIM, Chosun University
— EIA spectral profiles are studied as a function of applied static B-Field for the hyperfine transition from F_g =3 to F_e =3 of ^{85}Rb atoms at room temperature. We prepare resonant weak probe and strong coupling fields with a single laser using two AOMs. At zero B-field, laser radiation is on resonance with the degenerate N-type system. However, the degeneracy is lifted by the application of B-field, as all the magnetic sublevels are shifted except m=0 due to Zeeman effect. Coherence among the Zeeman sublevels is lost by the formation of multiple N-level subsystems. The amplitude of broad EIA spectral profile with the line width of 261 kHz splits into three spectra with the narrower line width of210 kHz at center and broad side bands of line width of 310 kHz. Experimental magneto-optical EIA signals match well with the theoretical calculations solved via time-dependent density matrix equations with multi-photon interactions between hyperfine sublevels.

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