



Non-linear magneto-optic and self polarization rotation by superposition of states

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We report the observation of enhanced magneto-optic rotation as the coherent superposition of different hyperfine states is established in an atomic sample. The polarization rotation near the two photon Raman resonance condition appears to have an analogous characteristic to the well established Faraday rotation observed in the vicinity of a single photon resonance, however it contains sharp features arising from coherent population trapping state. The profile of the two photon rotation signal exhibits interesting features for slightly imbalanced circular polarization component of the laser field as well as for on and away from the single photon resonance. The investigation can be used to explore the effect of superposition states generated by coherent population trapping on optical activity. A complete density matrix based numerical simulation that consistently captures all the relevant features of the experiment is presented.

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