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Effect of optical pumping in V and Λ type pump probe systems[1]
SHRABANA CHAKRABARTI, BISWAJIT RAY, PRADIP N. GHOSH, University of Calcutta — We have investigated the effect of a strong pump laser copropagating with a probe laser for both Λ and V type level schemes of the pump and probe fields inside a room temperature Rb vapour cell. With the Λ type scheme certain absorption enhanced peaks are observed across the Doppler broadened probe absorption profile. In addition to these peaks an Electromagnetically Induced Transparency dip is also observed at the centre of one of these peaks. For V type scheme pump probe spectroscopy with co and counter propagating pump probe beams are studied. In both cases we observe velocity selective resonances (VSR) which are strongly modified by optical pumping effects to another hyperfine component of the ground state. A repumping laser, from the dark ground level is used to transfer atoms from the dark state to the pump probe cycle to reduce the optical pumping effect. The effect of a control laser on the Lamb dip spectrum of the probe laser has also been investigated.

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