

Hyperfine pumping in kilogauss magnetic fields and the saturated absorption spectroscopy of rubidium vapors in the anti-relaxation coated cell.

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We report on the experiments on hyperfine pumping in ^{87}Rb vapor contained inside a coated cell. In low magnetic fields ($B \ll 1$ kG), a spin relaxation time of $\tau \sim 20$ ms is observed. For increased fields ($B > 2$ kG) nuclear spin decouples from the electronic one and an order of magnitude longer relaxation times ($\tau \sim 200$ ms) are observed. Additionally, we have studied the saturated absorption spectroscopy (SAS) in the coated cell. Fast hyperfine pumping by laser beams and inefficient repumping due to the slowed-down relaxation prevent the observation of SAS spectra under typical conditions. We have found, however, that the combination of fast sweeping of laser frequency and appropriate light intensities enables recovery of narrow, sub-Doppler features in the SAS spectra.