

Our new paper in Journal of magnetism and magnetic materials

Congratulations for the publication of paper "Relaxation time dependencies of optically detected magnetic resonance harmonics in highly sensitive Mx magnetometers"

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Measurement of extremely weak magnetic fields in double-resonance atomic magnetometers based on resonant optical excitation has been an active area of research in recent years. Magnetometer sensitivity can be improved via detection of higher harmonics of the magnetic resonance, a resonance which has a maximum sensitivity under conditions where the ratio of the amplitude to the line-width of the resonance signal is maximized. Based on the Bloch theorem, we analyze the time evolution of the spin polarization corresponding to each harmonic component of the resonance signal and measure this progression experimentally. Our results revealed that there is an optimal harmonic number for achieving the highest sensitivity. We have shown that the longitudinal and transverse relaxation times of spin polarization can manipulate the harmonics with the best sensitivity while the excitation frequency is detuned from the Larmor frequency.

