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Characterization of antirelaxation-coated vapor cells in high-temperature regime WENHAO LI[1], Peking University, MIKHAIL BALABAS, St. Petersburg State University, Russia, SZYMON PUSTELNY, Jagiellonian University, Poland, ARNE WICKENBROCK, Helmholtz Institute, JGU, Mainz, Germany, DMITRY BUDKER, Department of Physics, University of California, Berkeley, Lawrence Berkeley National Laboratory and Helmholtz Institute, JGU, Mainz, Germany — Antirelaxation-coated vapor cells are widely used in modern atomic physics experiments due to the coating's ability to maintain spin polarization during wall collisions. We characterize the performance of vapor cells with different coating materials by measuring longitudinal spin relaxation and vapor density at temperatures of up to 90°C. The longitudinal spin relaxation time (τ_{rel}) is measured with a modified version of "relaxation in the dark" technique [M. Graf et al, Phys. Rev. A 72, 023401 (2005)] and the vapor density (n) is obtained by fitting atomic absorption spectrum with linear absorption function. The spin-projection-noise-limited (or atomic shot noise limited) sensitivity for atomic magnetometers is $\delta B_{\mathrm{SNL}} \propto 1/\sqrt{n\tau_{\mathrm{rel}}T}$, where T is measurement time. Therefore, by showing the product of the longitudinal spin relaxation time and the vapor density increases with temperature, we demonstrate the potential of antirelaxation-coated cells in applications of future high-sensitivity magnetometers.

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