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Vector light shift averaging in paraffin-coated alkali vapor cells ELENA ZHIVUN, University of California, Berkeley, ARNE WICKENBROCK, Johannes Gutenberg-University Mainz, JULIA SUDYKA, Marian Smoluchowski Institute of Physics, BRIAN PATTON, University of California, Berkeley, SZYMON PUSTELNY, Marian Smoluchowski Institute of Physics, DMITRY BUDKER, Johannes Gutenberg-University Mainz — Light shifts are an important source of noise and systematics in optically pumped magnetometers. We demonstrate that the long spin coherence time in paraffin-coated cells leads to spatial averaging of the light shifts over the entire cell volume. This renders the averaged light shift independent, under certain approximations, of the light-intensity distribution within the sensor cell. These results and the underlying mechanism can be extended to other spatially varying phenomena in anti-relaxation-coated cells with long coherence times.

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