Abstract Submitted
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Progress toward the Cosmic Axion Spin Precession Experiments (CASPEr)[1] D. BUDKER[2], S. AFACH, D. ANTYPAS, J. BLANCHARD, P. BLÜMLER, L. BOUGAS, N. LEEFER, A. WICKENBROCK, Helmholtz Institute Mainz, Johannes Gutenberg University, M.P. LEDBETTER, B. PATTON, AOSense, Inc., S. RAJENDRAN, University of California at Berkeley, Berkeley, P. W. GRAHAM, Stanford Institute for Theoretical Physics, Stanford University, A.O. SUSHKOV, Harvard University, D.F. JACKSON KIMBALL, California State University - East Bay — We discuss progress on the design and construction of a new set of experiments to search for the QCD axion and axionlike-particle dark matter [Graham and Rajendran, Phys. Rev. D **88**, 035023 (2013); Budker et al., Phys. Rev. X **4**, 021030 (2014)]. Nuclei that interact with an oscillating background axion field acquire time-varying nuclear moments (for example, electric and magnetic dipole moments). Magnetic resonance techniques can be applied to search for precession of nuclear spins induced by the oscillating axion field. An initial phase of these experiments will cover many orders of magnitude in axionlike-particle parameter space beyond the current astrophysical and laboratory limits. It is anticipated that future versions of the experiments will offer sensitivity to QCD axions with masses $m_a < 10^{-9}$ eV.

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