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## The Sensitivity of Spin-Precession Axion Experiments

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A leading effort to detect axion dark matter is through its influence on nuclear spins. The detection scheme involves polarizing a sample of nuclei within a strong static magnetic field and searching for spin-precession induced by the oscillating axion field. We revisit the signal and noise in these experiments, finding some key differences with the existing literature. Most importantly, in the limit where the spin-relaxation time of the material is large compared to the axion coherence time, we find the signal grows with time even beyond the coherence time. This feature results in stronger projected sensitivity in spin-precession experiments and increases the viability of detecting the QCD axion.

Summary

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