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Light Axion Dark Matter Search with Nitrogen-Vacancy Centers in Diamonds

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We propose new ideas to directly search for light axion dark matter by using magnetometry with nitrogen-vacancy centers in diamonds. If the axion dark matter couples to the electron spin, it affects the evolution of the Bloch vectors consisting of the spin-triplet states, which may be detected through several magnetometry techniques. We give several concrete examples with the use of dc and ac magnetometry and estimate the sensitivity on dark matter couplings.

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