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Light Dark Matter Search with Nitrogen-Vacancy Centers in Diamonds

Tuesday 27 June 2023 15:40 (20 minutes)

Axions and dark photons are well-motivated dark matter candidates but much of their parameter space remains unexplored. We demonstrate that magnetometry with nitrogen-vacancy centers can cover a broad parameter space with masses over several orders of magnitude. Its unique advantages include a wide dynamic range and the ability to perform measurements without magnetic shielding enhancing its sensitivity to large mass ranges. The proposed method provides a new way to access unexplored regions and will impact future dark matter searches. This brand-new interdisciplinary study demonstrates how recent developments in engineering and industrial science are instrumental in solving fundamental physics problems.

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