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Search for Dark Matter with Levitated Ferromagnetic Spin Sensor

Wednesday 27 August 2025 18:00 (20 minutes)

In this talk, I will focus on is the levitated ferromagnetic spin sensor, which offers significant advantages due to its weak coupling with the environment, enabling superior noise isolation[1][2]. Additionally, the strong spin correlation within the ferromagnetic sensor provides promising noise suppression and signal enhancement capabilities, particularly in experiments probing the low-frequency regime. These features make levitated ferromagnetic spin sensors highly sensitive and well-suited for both new physics searches and real-world applications.

[1] F. Ahrens., W.Ji, D. Budker et al, Levitated Ferromagnetic Magnetometer with Energy Resolution Well Below $\hbar$. Phys. Rev. Lett. 134(11), 110801(2025).

S. Kalia, D. Budker; D. F. J Kimball, W. Ji et al, Ultralight Dark Matter Detection with Levitated Ferromagnets. Phys. Rev. D 2024, 110 (11), 115029（2025）.

Collaboration you are representing

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