

A low frequency Axion search using the storage ring electric dipole moment method

Friday 6 July 2018 20:15 (15 minutes)

The Axion-gluon coupling induces an oscillating electric dipole moment (EDM) in nucleons. The axion induced oscillating EDM can be detected using storage ring EDM method with resonance between $g-2$ precession frequency and the oscillating EDM. Frequency range from mHz to 100 MHz can be scanned with the resonance method and below mHz down to about 10^{-9} Hz (assuming 4 years of measurement) can be searched using the frozen spin method and by combining many consecutive run data. The estimated sensitivity is at the level of 10^{-30} e.cm or higher. No other experiment has accessed the proposed frequency range at this high sensitivity until now. In this study, we present the experimental method and compare the sensitivity with other experiments. (This work was supported by IBS-R017-D1-2018-a00.)

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Session Classification: POSTER

Track Classification: Beyond the Standard Model