

axion, magnetic monopole and detection of new axion couplings

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The Witten effect implies interaction between axion and magnetic monopole, and the quantum electrodynamics (QEMD) properly describes electric charges, magnetic charges and photons. Based on the QEMD, a generic low-energy axion-photon effective field theory can be built. This generic axion-photon Lagrangian introduces the interactions between axion and two four-potentials, and leads to new axion-modified Maxwell equations. We properly solve the new axion-modified Maxwell equations and obtain the axion-induced electromagnetic fields given a static electric or magnetic field. I will also mention our proposals of new search strategies to measure the new axion couplings for sub- μ eV axion in haloscope experiment.

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