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Some implications of Strong CP-violation: Vacuum Polarization and Vacuum Birefringence

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Strong CP-violation implies that a vacuum permeated by electromagnetic fields develops an anomalous electric dipole moment, parallel to the external magnetic field. We compute such an induced dipole moment using chiral perturbation theory and we show that CP-odd effects grow very rapidly with temperature. We also compute the anomalous CP-odd vacuum birefringence and its effect on linearly polarized photons propagating inside a Fabry-Perot cavity.

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