Contribution ID: **240** Type: **not specified**

ALP contribution to the Strong CP problem

Tuesday 4 June 2024 15:10 (20 minutes)

We compute the one-loop contribution to the $\bar{\theta}$-parameter of an axion-like particle (ALP) with CP-odd derivative couplings. Its contribution to the neutron electric dipole moment is shown to be orders of magnitude larger than that stemming from the one-loop ALP contributions to the up- and down-quark electric and chromoelectric dipole moments. This strongly improves existing bounds on ALP-fermion CP-odd interactions, and also sets limits on previously unconstrained couplings. The case of a general singlet scalar is analyzed as well. In addition, we explore how the bounds are modified in the presence of a Peccei-Quinn symmetry.

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Session Classification: Parallel Session PI.2