Abstract Submitted
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Strong CP violation in nuclear physics SACHIN SHAIN PORUVELIL, University of Massachusetts, Amherst — Electric dipole moments of nuclei, diamagnetic atoms, and certain molecules are induced by *CP*-violating nuclear forces. The naive dimensional analysis predicts these forces to be dominated by long-range one-pion-exchange processes, with short-range forces entering only at next-to-next-to-leading order in the chiral expansion. Based on renormalization arguments we argue that a consistent picture of *CP*-violating nuclear forces requires a short-distance operator acting in the unique $j = 0$ ${}^1S_0$-${}^3P_0$ transition due to the attractive and singular nature of the strong tensor force in the ${}^3P_0$ channel. We discuss strategies on how the finite part of the associated low-energy constant can be determined in the case of strong *CP* violation from the QCD $\bar{\theta}$ term, and speculate on the impact on observables of experimental interest such as nuclear EDMs and axion searches.

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