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The equivalent Electric Dipole Moment in SMEFT

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The Electric Dipole Moment of the electron (eEDM) is typically investigated in experiments using paramagnetic molecules. However, the physical observable in these searches consists of a linear combination of CP-violating interactions, rather than the eEDM alone, which is commonly referred to as the equivalent EDM of the system. Assuming the presence of new CP-odd physics from heavy degrees of freedom, I parametrize its effects within the Standard Model Effective Field Theory (SMEFT) framework. In this talk, I will present the contributions to the full low-energy direction probed by EDM searches, focusing on leading-order effects at dimension six and one-loop level, while also discussing selected two-loop and dimension-eight contributions. I will highlight that eEDM experiments are sensitive to a broader class of SMEFT operators than previously recognized.

Secondary track

T07 - Flavour Physics and CP Violation

Authors: Dr ARDU, Marco (IFIC (University of Valencia - CSIC)); VALORI, Nicola (IFIC (University of Valencia - CSIC))

Presenter: VALORI, Nicola (IFIC (University of Valencia - CSIC))

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