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Connecting Scales: RGE effects in the SMEFT from LHC to Future Colliders

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Global interpretations of particle physics data within the framework of the Standard Model Effective Field Theory (SMEFT), including their matching to UV-complete models, involve energy scales potentially spanning several orders of magnitude.

Relating these measurements in terms of a common energy scale is enabled by the Renormalisation Group Equations (RGEs).

Here we present a systematic assessment of the impact of RGEs in a global SMEFT fit of LEP and LHC data within the SMEFiT framework.

Additionally, we evaluate the role of RGEs in matching to representative BSM models at tree-level and one-loop, and quantify the impact of logarithmic QCD and electroweak corrections resummed in the RGEs for future collider sensitivity projections, particularly for FCC-ee.

Authors: VRYONIDOU, Eleni (The University of Manchester (GB)); ROJO CHACON, Juan (Nikhef National institute for subatomic physics (NL)); MANTANI, Luca (IFIC, Valencia)

Presenter: MANTANI, Luca (IFIC, Valencia)

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