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Entangled Taus at Colliders

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Studies of entanglement and other quantum information measures at colliders have recently been proposed to probe fundamental interactions at high energies. Inspired by these results, we examine tau pair productions at both lepton and hadron colliders, to probe dimension-6 dipole operators in the Standard Model Effective Field Theory (SMEFT).
The SMEFT contributions are found to be sizable in some regions of parameter space, if quadratic contributions are considered, prompting a comparison with other known indirect constraints on the tau dipole operators. We also find interesting patterns of entanglement across the phase spemphasized textace, feeding into previous discussions on quantum information in the context of EFTs.

Authors: ELOR, Gilly; Dr SUMENSARI, Olcyr (IJCLab); LO CHIATTO, Prisco (JGU Mainz / PRISMA+); AOUDE, Rafael

Presenter: LO CHIATTO, Prisco (JGU Mainz / PRISMA+)

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