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【363】Fully differential NLO predictions for rare and radiative lepton decays

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We present a fully differential calculation at NLO of the radiative ($\mu \to \nu\bar{\nu}e + \gamma$) and rare ($\mu \to \nu\bar{\nu}e + e^+e^-$) muon decays in the effective Fermi theory keeping the full dependence on m_e. These processes are the irreducible background for the experimental searches for lepton flavour violation by MEG and Mu3e, as they become indistinguishable from the corresponding signals when the neutrinos carry little energy.

Aside from being a fundamental background, these processes are interesting in their own right. Using a tension between BaBar's recent measurement of $\mathcal{B}(\tau \to \nu\bar{\nu}e + \gamma)$ and NLO predictions as an example, we show that fully differential NLO calculations are necessary for current and future measurements, especially when very stringent cuts are applied.

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