

Light-meson leptonic decay rates from lattice QCD+QED calculations

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The decreasing uncertainties in theoretical predictions and experimental measurements of several hadronic observables related to weak processes, which in many cases are now smaller than $O(1\%)$, require theoretical calculations to include subleading corrections that were neglected so far. Precise determinations of leptonic and semi-leptonic decay rates, including QED and strong isospin-breaking effects, can play a central role in solving the current tensions in the first-row unitarity of the CKM matrix. In this talk we discuss the recent progress on lattice calculations of isospin-breaking corrections to leptonic decay rates of pseudoscalar mesons, presenting new results by the RBC/UKQCD collaboration. The inclusion of long-distance QED interactions on the lattice, evaluated using the QED_L prescription, produces sizeable finite-volume corrections. The relevant role of these effects in the high-precision determination of leptonic decay rates will be discussed, along with prospects for future improvement.

Presenter: DI CARLO, Matteo (University of Edinburgh)

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