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Isospin breaking corrections to QCD observables

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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 weak 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 review the recent progress on lattice calculations of isospin-breaking corrections to QCD observables, with a focus on leptonic decay rates of pseudoscalar mesons. We discuss recent lattice results for kaon and pion decays, the role of finite-volume effects in such calculations, along with prospects for future improvement.

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