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Controlling quark mass determinations non-perturbatively in three-flavour QCD

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The determination of quark masses from lattice QCD simulations requires a non-perturbative renormalization procedure and subsequent scale evolution to high energies, where a conversion to the commonly used $\overline{\text{MS}}$ scheme can be safely established. We present our results for the non-perturbative running of renormalized quark masses in $N_f = 3$ QCD between the electroweak and a hadronic energy scale, where lattice simulations are at our disposal. Recent theoretical advances in combination with well-established techniques allows to follow the scale evolution to very high statistical accuracy, and full control of systematic effects. We close the presentation with prospects for quark mass determinations in physical units from three-flavour QCD.

Summary

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