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QED corrections to hadronic processes in lattice QCD

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Recently, a method has been proposed for the first time to compute electromagnetic effects in hadronic processes using lattice simulations. The method can be applied, for example, to the leptonic and semileptonic decays of light or heavy pseudoscalar mesons. For these quantities the presence of infrared divergences in intermediate stages of the calculation makes the procedure more complicated than is the case for the hadronic spectrum, for which lattice calculations already exist. In this talk, I illustrate the method for the leptonic decays of a pseudoscalar meson. Its practical implementation, although challenging, is within reach of the present lattice technology. Electromagnetic and isospin breaking corrections to quark and hadron masses will be also briefly reviewed, mainly relying on the analysis performed by the FLAG working group.

References

1. N. Carrasco, V. Lubicz, G. Martinelli, C. T. Sachrajda, N. Tantalo, C. Tarantino and M. Testa, arXiv:1502.00257 [hep-lat].
2. FLAG Working Group, S. Aoki et al., Eur. Phys. J. C 74 (2014) 9, 2890.

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