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Lattice QCD Predictions for Meson Electromagnetic Form Factors at High Momenta: Testing Factorization in Exclusive Processes

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We report the first lattice QCD computation of pion and kaon electromagnetic form factors, $F_M(Q^2)$, at large momentum transfer up to 10 and 28 GeV2, respectively. The calculations are performed using HISQ action on fine lattices with physical quark massesi and Breit frame [1].
We test the QCD collinear factorization framework utilizing our high- Q^2 form factors at next-to-next-to-leading
order in perturbation theory, and lattice QCD results on the pion and kaon distribution amplituded calculated within the LaMET approach using fine HISQ lattices with physical quark masses [2].
Within estimated uncertainties we find that QCD collinear factorization framework works [1].

References

[1] H.-T. Ding et al, arXiv:2404.04412 [hep-lat]
[2] I. Cloet et al, arXiv:2407.00206 [hep-lat]

Primary author: PETRECZKY, Peter

Co-authors: Mr BOLLWEG, Dennis; SHI, Qi; ZHANG, Rui; MUKHERJEE, Swagato; GAO, Xiang (Argonne National Lab); ZHAO, Yong

Presenter: PETRECZKY, Peter

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