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Lattice QCD prediction of pion and kaon electromagnetic form factor at large Q^2 up to 10 and 28 GeV^2

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The electromagnetic form factor, especially its asymptotic behavior for large momentum transfer (Q^2), of pion and kaon provides crucial insight into the partonic structure of a Nambu-Goldstone boson in the strong interaction. Studies of the electromagnetic form factor of pion and kaon up to $Q^2 \sim 6 \text{ GeV}^2$ are underway at the ongoing JLab12 experiment and its measurements in an extended range of $Q^2 \sim 10 - 40 \text{ GeV}^2$ are planned at the future Electron-Ion Collider (EIC). For the first time, we will present results for the pion and kaon electromagnetic form factor in the range of $Q^2 \sim 0 - 10$ and 28 GeV^2 , respectively, from state-of-the-art lattice QCD calculations carried out using physical values of up, down, and strange quark masses. These results will provide benchmark QCD predictions for model-based studies and the experimental measurements, in particular at the boundaries between the JLab12 and the EIC.

Topical area

Structure of Hadrons and Nuclei

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