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Parton physics from a heavy-quark operator product expansion: Dynamical lattice QCD calculation of moments of the pion and kaon light-cone distribution amplitude

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The light-cone distribution amplitude (LCDA) is a non-perturbative quantity for understanding hadron structure and exclusive scattering processes. We present on our calculation of moments of the pion and kaon LCDAs using the heavy-quark operator product expansion (HOPE) framework. This method employs an OPE analysis of hadronic amplitudes through the inclusion of a fictitious valence heavy quark.

Our previous work has successfully applied this framework to determine the second and fourth Mellin moments of the pion LCDA in the quenched approximation. In this work, we extend the application of HOPE to dynamical lattice QCD calculations using CLS ensembles. We present preliminary results for the first three nontrivial Mellin moments of the kaon LCDA and the second moment of the pion LCDA. These results demonstrate the feasibility of the HOPE method for accessing higher moments of meson LCDAs from dynamical lattice QCD.

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