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Extracting Vector Mellin Moments for the Pion and Kaon in Lattice QCD

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In recent years, the x-dependence of parton distribution functions (PDFs) has become accessible through non-local operators of a boosted hadron by utilizing techniques such as large momentum effective theory (LaMET) and short distance factorization (SDF). Embedded in these distribution functions are Mellin moments, which contain information on fundamental properties of hadrons, such as the fraction of the hadron momentum carried by quarks. Moments can be extracted by utilizing SDF, which can then be benchmark of the validity of PDF construction. The pion is particularly interesting to study as it is the lightest hadron, and its SU(3) symmetry counterpart, the kaon, is also of interest. In studying both of these hadrons, we can compare the up and strange quark contributions individually and study SU(3) symmetry breaking. In this work, we study the extraction of the moments at NLO and NNLO accuracy, as well as study DGLAP evolution to study systematics.

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