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Calculation of Pion Valence Distribution form Hadronic Lattice Cross Sections

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Recently, it has been shown that a class of coordinate-space-separated non-local hadronic matrix elements, computable directly in lattice QCD, can be factorized into parton distribution functions with calculable coefficients, in the same manner as the hadronic cross sections measured in an experiment [Phys.Rev.Lett. 120 (2018) no.2, 022003]. The pion and kaon, the lightest pseudo scalar mesons, provide an excellent theatre in which to explore these ideas. Furthermore, the pion is of inherent theoretical interest and plays a vital role in the understanding the nucleon and in nuclear structure. In this talk, we describe progress at understanding the valence quark distribution of the pion using configuration-space separated gauge-invariant hadronic currents.

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