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Partonic quasidistributions of the pion in chiral quark models

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The evaluation of partonic distributions presents a challenge for QCD, and in particular for its lattice realization. Recently, objects called quasidistributions (which become standard distributions in a limit of the longitudinal momentum of the target hadron going to infinity) have been proposed, but their features are not fully comprehended. We present a dynamical evaluation of the quark quasidistribution amplitude (QDA) and the valence quark quasi-distribution function (QDF) of the pion in the framework of chiral quark models (the Nambu–Jona-Lasinio model and the spectral quark model). We arrive at simple but nontrivial analytic expressions, where the dependence on the longitudinal momentum, the momentum fraction, or the transverse-momentum (for the unintegrated objects) can be explicitly assessed. We carry out the necessary QCD evolution from the constitutent quark model scale to higher scales accessible on the lattice, and compare favorably to the recent QCD lattice simulations.

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