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Generalized parton distributions for the pion within the proper-time Nambu–Jona-Lasinio model

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The internal structure of the pion is investigated using generalized parton distribution (GPD) within the framework of the covariant Nambu–Jona-Lasinio (NJL) model. As an effective chiral symmetry-based theory of QCD, the NJL model provides valuable insight into non-perturbative aspects of pion structure. In the NJL model, to omit the divergence in the quark propagators, we apply a proper-time regularization scheme. We then evaluate the inhomogeneous Bethe–Salpeter equations and compute the corresponding GPD. This approach enables a consistent connection to pion form factors (FFs) and deepens our understanding of the underlying quark-gluon dynamics. Our preliminary results on tensor and vector pion GPDs are presented, and future work will be discussed.

Keywords: *Internal structure, generalized parton distribution, Nambu–Jona-Lasinio model, chiral symmetry, proper-time regularization scheme, electromagnetic form factors, quark dynamics.*

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