

2022 Meeting on Lattice Parton Physics from Large Momentum Effective Theory (LaMET2022)



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Extraction of pion GPD from lattice QCD using an asymmetric frame

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Historically, GPDs have been defined in the symmetric frame, where the momentum transfer between the initial and final hadron state is equally distributed to the two states.

Such a setup is computationally very costly for their frame-dependent counterparts in lattice QCD, such as the quasi-GPDs. In this work we present a calculation of the pion GPD using the methodology proposed recently in Ref. [1], in which the lattice matrix elements decompose into Lorentz invariant amplitudes. These amplitudes can be calculated in any frame and can then be related to the light-cone GPDs. For this proof-of-concept calculation, we use one ensemble of $\text{wf}=2+1+1$ twisted mass fermions and a clover improvement with a pion mass of 260 MeV to calculate the H-GPD for the pion.

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