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Proton GPDs from Lattice QCD

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The few calculations of x -dependent GPDs performed in lattice QCD use the symmetric frame, where the momentum transfer is evenly divided between the momentum of the initial and final hadron states. To obtain the GPDs for several values of the momentum transfer in a computationally efficient method, we employ an asymmetric frame developed in PRD 106 (2022) 11, 114512. The kinematic setup we use allows all momentum transfer to be assigned to the initial state. The calculation uses an $N_f = 2 + 1 + 1$ ensemble of twisted mass fermions with a clover improvement. The light quark masses provide a pion mass of about 260 MeV. This talk will cover the implementation of the asymmetric frame and the extraction of twist-2 GPDs for the proton with unpolarized quarks (H and E), as well as the helicity (\tilde{H}) case, both at zero skewness.

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