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Transverse densities in the nucleon's chiral periphery

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Transverse densities describe the nucleon's spatial structure in the parton picture and correspond to a projection of the GPDs in the impact parameter representation. We use chiral effective field theory to calculate the transverse charge and current densities in the nucleon's chiral periphery (transverse distances $b \sim 1/m\_pi$) and study their properties [1]. The peripheral densities are expressed in terms of the light-cone wave function of the chiral pion-nucleon system, calculable directly from the chiral Lagrangian. A simple mechanical interpretation of the peripheral densities is obtained in terms of the (classical) orbital angular momentum structure of the system. We also extend these studies to the peripheral transverse densities of matter and momentum, related to the energy-momentum tensor form factors, and verify their relation to moments of peripheral GPDs.

[1] C. Granados, C. Weiss, JHEP 1401 (2014) 092

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