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Transverse momentum distributions inside the nucleon from lattice QCD

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Transverse momentum dependent parton distribution functions encode information about the intrinsic motion of quarks in the nucleon. We present first calculations on the lattice, based on MILC gauge configurations and propagators from LHPC. The resulting spin-dependent densities exhibit visible dipole deformations in the nucleon. For our exploratory calculations we employ a non-local operator with a non-perturbatively renormalized direct Wilson line. A more elaborate operator geometry is needed for quantitative comparisons to azimuthal asymmetries observable in experiments, such as the Sivers effect in semi-inclusive deeply inelastic scattering.

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talk

Primary author: MUSCH, Bernhard (Jefferson Lab, USA)

Co-authors: Prof. SCHÄFER, Andreas (Universität Regensburg, Germany); Prof. NEGELE, John W. (Massachusetts Institute of Technology, USA); Dr HÄGLER, Philipp (Technische Universität München, Germany)

Presenter: MUSCH, Bernhard (Jefferson Lab, USA)

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