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Transversity PDFs of the proton from lattice QCD with physical quark masses

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We present a lattice QCD calculation of the transversity isovector- and isoscalar-quark parton distribution functions (PDFs) of the proton utilizing a perturbative matching at next-to-leading-order (NLO). Additionally, we determine the isovector and isoscalar tensor charge for the proton. The calculations are performed using a single ensemble of $N_f = 2 + 1$ highly-improved staggered quarks simulated with physical-mass quarks and a lattice spacing of $a = 0.076$ fm. The Wilson-clover action, with the gauge links after one iteration of HYP smearing and physical quark masses, is used in the valence sector. The leading-twist OPE approximation is then utilized to extract the lowest four Mellin moments and the PDFs.

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