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Wigner distribution and spin structure of pion from light front holographic QCD

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We investigate the Wigner distributions of the pion using a holographic light-front pion wavefunction with dynamical spin effects to unravel the spatial and spin structure. Using a universal AdS/QCD scale and constituent quark masses, we find that the dynamical spin effects are maximal in the pion where they lead to an excellent simultaneous description of a wide range of data: the decay constant, charge radius, spacelike electromagnetic and transition form factors, as well as, parton distribution function. Here, we present the Wigner distributions for unpolarized and transversely polarized quark in the transverse momentum plane as well as in the transverse impact parameter plane. The leading twist GTMDs, GPD, and TMDs for pion are also presented.

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