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Light-cone distribution amplitudes of a light baryon in large-momentum effective theory

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Momentum distributions of quarks/gluons inside a light baryon in a hard exclusive process are encoded in the light-cone distribution amplitudes (LCDAs). In this work, we point out that the leading twist LCDAs of a light baryon can be obtained through a simulation of a quasi-distribution amplitude calculable on lattice QCD within the framework of the large-momentum effective theory. We calculate the one-loop perturbative contributions to LCDA and quasi-distribution amplitudes and explicitly demonstrate the factorization of quasi-distribution amplitudes at the one-loop level. Based on the perturbative results, we derive the matching kernel in the $\overline{\text{MS}}$ scheme and regularization-invariant momentum-subtraction scheme. Our result provides a first step to obtaining the LCDA from first principle lattice QCD calculations in the future.

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