

Heavy-quark mass effects in off-light-cone distributions

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In recent years, there has been a growing interest in the possibility of extracting parton distributions of QCD from Lattice simulations. Since it is not possible to extract the light-cone distributions via Lattice QCD, they are extracted in the Euclidean region $z_E^2 = -z^2 > 0$, and then matched to the light-cone one, through the use of perturbative math kernels. In the case of heavy-quark distributions, e.g., the charm PDF, the presence of an additional scale gives rise to power corrections of the type $z^2 m_Q^2$. Since the condition $z^2 m_Q^2 \rightarrow 0$ is difficult to achieve at the current lattice spacing, these mass corrections must be included. We propose a method to include this effect at the level of the perturbative matching kernels, needed to connect the off-light-cone distributions (extracted from Lattice) to the light-cone ones that we probe in actual experiments. We discuss the quantitative impact of these corrections at one-loop.

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