Quasi Parton Distribution Functions: Renormalization in Dimensional Regularization

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Abstract. Quasi Parton Distribution Functions (quasi-PDFs) are nowadays widely employed in the nonperturbative study of nucleon structure in lattice QCD. The computation of these functions in large scale simulations allows the nonperturbative study of the physical PDFs from first principles. In this talk, I will present the renormalization of nonlocal quark operators involved in the definition of quasi-PDFs, in RI' and $\overline{MS}$ renormalization schemes, using dimensional regularization. The renormalization functions of these nonlocal operators can be used to convert the corresponding lattice nonperturbative results to the $\overline{MS}$ scheme, which is the most widely used renormalization scheme for the analysis of experimental data in high-energy physics. The novel aspect of this work is the presence of nonzero quark masses in our computations, which results in mixing among these nonlocal operators in the continuum; our study is thus relevant for disentangling the observed operator mixing on the lattice.

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