

Intrinsic Charged-Current DIS at NNLO QCD

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Heavy flavor mass effects are significant in deep inelastic scattering (DIS) processes, and their systematic treatment becomes of more importance as we approach a one-percent accuracy in the determination of Parton Distribution Functions (PDFs). These effects are included through so-called variable flavor number schemes (VFNS), and most of the ingredients that are required by these schemes have been calculated in the past at next-to-next-to-leading order (NNLO) QCD. However, one ingredient, and we refer to it as the intrinsic charged-current DIS, is still missing

$c+W^- \rightarrow s + X$, where c is a heavy (massive) flavor, and s is a light (massless) one.

In this talk, we present the calculations of the intrinsic charged-current DIS structure functions at NNLO QCD with exact initial heavy flavor mass dependence. We discuss the peculiarities of these calculations. Furthermore, we discuss the importance of our result for the study of the intrinsic charm component of PDFs. These calculations pave the way to the systematic evaluation of theoretical uncertainties that are associated with heavy flavor mass effects in PDFs at NNLO QCD and beyond.

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