

Heavy Quark Fragmentation in e^+e^- Collisions to NNLO+NNLL Accuracy in Perturbative QCD

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Fragmentation of heavy quarks into heavy-flavoured hadrons receives both perturbative and non-perturbative contributions. We consider perturbative QCD corrections to heavy quark production in e^+e^- collisions to next-to-next-to-leading order accuracy in QCD with next-to-next-to-leading-logarithmic resummation of quasi-collinear and soft emissions.

We study multiple matching schemes, and multiple regularisations of the soft resummation, and observe a significant dependence of the perturbative results on these ingredients, suggesting that NNLO+NNLL perturbative accuracy may not lead to real gains unless the interface with non-perturbative physics is properly analysed.

We confirm previous evidence that D^{*+} experimental data from CLEO/BELLE and from LEP are not reconcilable with perturbative predictions employing standard DGLAP evolution.

We extract non-perturbative contributions from e^+e^- experimental data for both D and B meson fragmentation. Such contributions can be used to predict heavy-quark fragmentation in other processes, e.g. DIS and proton-proton collisions.

Primary author: BONINO, Leonardo (University of Zurich)

Presenter: BONINO, Leonardo (University of Zurich)

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