



Contribution ID: 267

Type: not specified

Fragmentation contributions to J/ψ photoproduction at HERA

Thursday, 1 September 2016 14:30 (20 minutes)

We compute leading-power fragmentation corrections to J/ψ photoproduction at DESY HERA, making use of the nonrelativistic QCD factorization approach. Our calculations include parton production cross sections through order α_s^3 , fragmentation functions through order α_s^2 , and leading logarithms of the transverse momentum divided by the charm-quark mass to all orders in α_s . We find that the leading-power fragmentation corrections, beyond those that are included through next-to-leading order in α_s , are small relative to the fixed-order contributions through next-to-leading order in α_s . Consequently, an important discrepancy remains between the experimental measurements of the J/ψ photoproduction cross section and predictions that make use of nonrelativistic-QCD long-distance matrix elements that are extracted from the J/ψ hadroproduction cross-section and polarization data.

Summary

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Session Classification: Section C

Track Classification: Section C: Heavy Quarks