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Factorization for J/ψ leptonproduction at small transverse momentum

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When quarkonium is produced in the low-transverse momentum region, the contribution of soft and ultra-soft radiation between the heavy-quark pair becomes relevant. At this region, non-relativistic QCD (NRQCD) breaks down and we need to promote the long-distance matrix elements to the TMD shape functions (TMD-ShFs) in the NRQCD factorization procedure. In this talk, I discuss the cross section factorization for the J/ψ leptonproduction in terms of these TMDShFs at small transverse momentum.

I then discuss our results of the TMDShFs at next-to-leading order in the QCD coupling constant, the renormalization group evolution for the TMDShFs and the matching onto the collinear functions at high transverse momentum.

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