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Exclusive J/ψ process tamed to probe the low x gluon

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The perturbative QCD expansion for J/ψ photoproduction appears to be unstable: the NLO contribution is large (and of opposite sign) to the LO contribution. Moreover, the predictions are very sensitive to the choice of factorization and renormalization scales. Here we show that perturbative stability is achieved by imposing a ' Q_0 cut' on the NLO coefficient functions; a cut which is required to avoid double counting. Q_0 is the input scale used in the parton DGLAP evolution. This result opens the possibility of high precision exclusive J/ψ data in the forward direction at the LHC (that is, $pp \rightarrow p + J/\psi + p$ data) being able to determine the low x gluon distribution at low scales.

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