

Photoproduction of J/ψ and Υ in exclusive and proton-dissociative diffractive events

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Collaboration

Abstract content

The amplitude for $\gamma p \rightarrow Vp$, where V is a J/ψ or Υ ground state or excited vector meson, is calculated in a pQCD k_T -factorization approach. We use this amplitude to predict the cross section for exclusive photoproduction of $J/\psi, \psi', \Upsilon$ mesons in proton-proton collisions. Calculations are performed for a variety of unintegrated gluon distributions, and we compare to LHCb data. Compared to earlier calculations we include both Dirac and Pauli electromagnetic form factors. We discuss the role of the $Q\bar{Q}$ light-cone wave functions for differential distributions for ratios such as $\sigma(\psi')/\sigma(J/\psi)$. Absorption effects are taken into account and their role is discussed in detail.

We also discuss the related diffractive production in proton dissociative events. Here special emphasis is put on electromagnetic dissociation, which is calculable without additional free parameters. Besides being of interest in their own right, they constitute an important experimental background to exclusive production. We also comment on the role of dissociative photoproduction for other states, e.g. light vector mesons.

The talk will be based on A. Cisek, W. Schafer and A. Szczurek, JHEP 1504 (2015) 159 and ongoing work by the same authors.

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