The dynamics of quarkonium production

Paul Hoyer and Stéphane Peigné[1]

NORDITA
Blegdamsvej 17, DK-2100 Copenhagen Ø

June 1, 1998

Abstract

Quarkonium production is a sensitive probe of the dynamics of hard scattering, which can 'measure' the environment of the heavy quark pair after it is created in a hard process. Quarkonium hadroproduction data indicates that the produced pair experiences a secondary, hard interaction and then ceases to interact at a stage when the pair is still compact (compared to the size of the quarkonium wave function). These features differ from the scenarios postulated by current models. An approach which relies on an early, perturbative rescattering of the pair with a comoving color field can explain the observed features, including the polarization, the χ_1/χ_2 ratio and the nuclear target A–dependence, which are difficult to understand otherwise.

[1]Work supported in part by the EU/TMR contract ERB FMRX-CT96-0008.