

DRELL–YAN CROSS SECTION AND J/ψ PRODUCTION IN HIGH-ENERGY NUCLEUS–NUCLEUS COLLISIONS¹

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The Drell–Yan differential distribution dN_{DY}^{AB}/dE_T is used in high-energy nucleus–nucleus collisions to obtain a relation between the transverse energy E_T and the impact parameter b . Such a relation is then utilized to study the transverse-energy dependence of J/ψ production in Pb–Pb collisions, using the J/ψ absorption model presented previously. The anomalous Pb–Pb suppression data at 158A GeV can be explained if one assumes the occurrence of a new phase of strong J/ψ absorption when the energy density exceeds 4.2 GeV/fm³. The results are extended to make predictions for J/ψ production at higher collision energies. It is found that J/ψ survival probabilities reach the lowest survival limit when the nucleon–nucleon center-of-mass energies \sqrt{s} is greater than about 35 GeV.

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