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Inclusive diffractive heavy quarkonium photoproduction in pp , pA and AA collisions

Summary

The inclusive J/Ψ production by direct and resolved photoproduction in the γp scattering is calculated based on the nonrelativistic quantum chromodynamics (NRQCD) factorization formalism, which is in good agreement with the experimental data of total cross section distribution of heavy quarkonium production at HERA. Then we extend the formalism including the direct and resolved photoproduction processes to resolved pomeron model to study the heavy quarkonium photoproduction at the LHC energies. We present the predictions of rapidity and transverse momentum distributions of the inclusive diffractive J/Ψ , $\Psi(2S)$ and Υ photoproduction in pp , pPb and $PbPb$ collisions at the LHC energies. Our numerical results indicate that the resolved photoproduction processes play an important role in the heavy quarkonium production. Especially for pp collisions, the contribution of resolved photoproduction processes is the largest, which can reach to 28%, 13% and 44% for the rapidity distributions of J/Ψ , $\Psi(2S)$ and Υ inclusive diffractive photoproduction, respectively.

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