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Production of J/ψ quarkonia in color evaporation model based on k_T -factorization

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We discuss the k_T -factorization approach for $c\bar{c}$ production in the context of the color evaporation model for J/ψ meson production. We use a new approach to color evaporation model (CEM) for quarkonium production. The production of $c\bar{c}$ pairs is performed within k_T -factorization approach using different unintegrated gluon distribution functions (UGDF) from the literature. We include all recent improvements to color evaporation model. We cannot describe simultaneously mid and forward rapidity data measured at the LHC when using the KMR UGDF based on collinear MMHT2014lo PDF with the same normalization parameter. Furthermore we get somewhat too hard distribution in

J/ψ transverse momentum. Correcting the standard KMR-MMHT2014lo distributions for saturation effects at small values of x improves J/ψ rapidity distributions. When using CT14lo collinear PDFs a better agreement with the LHCb data can be achieved without clear need for implementing saturation effects. We get poor description of the large transverse momentum distributions of J/ψ with the JH-2013 CCFM-based UGDF. Here explicit inclusion of $2 \rightarrow 3$ processes considerably improves the situation. Similar effects are discussed in the context of the KMR UGDF.

More details of the studies can be found in Ref.[1].

[1] R. Maciula, A. Szczurek and A. Cisek, “ J/ψ -meson production within improved color evaporation model with the k_T -factorization approach for $c\bar{c}$ production”, arXiv:1810.08063 [hep-ph].

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