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Improvement of heavy flavor productions in an updated multiphase transport model

Summary

Recently we have updated a multi-phase transport (AMPT) model with modern parton distribution functions of nuclei (nPDFs). Here we study open charm productions in the updated AMPT model and compare to the experimental data from pp and AA collisions over a wide range of collision energies. Besides the nPDFs, we have removed the previous transverse momentum cutoff on heavy quarks and also included the resultant heavy flavor cross section into the total jet cross section in the initial condition as described by the HIJING model. We show that the AMPT model with these updates provide a much better description of the yields and transverse momentum spectra of various open charm hadrons in comparison with the experimental data from pp and heavy ion collisions. This lays the foundation for further heavy flavor studies within the transport model approach

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