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Production of multi-charmed and exotic hadrons in heavy ion collisions

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We discuss multi-charmed and exotic hadrons in heavy ion collisions by focusing on their production based on both the statistical and coalescence models. Starting from the investigation on estimated yields of multi-charmed hadrons in the statistical hadronization model, we consider transverse momentum distributions of those hadrons produced at quark-hadron phase transition in the coalescence model. We also consider the yield and the transverse momentum distribution of charmed exotic hadrons such as X(3872) and recently observed Tcc mesons, and furthermore evaluate transverse momentum distribution ratios between various charmed hadrons. We show that the transverse momentum distribution ratios are closely related to the kinds and numbers of quarks as well as the interplay between constituent quarks of those hadrons, and therefore we insist that studying both the transverse momentum distribution and transverse momentum distribution ratios of multi-charmed and exotic hadrons provides us with useful information on hadron production mechanism in heavy ion collisions.

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