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Measurements of Λ_c^+ and X(3872) production in PbPb for the studies of charm hadronization with CMS

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Being a powerful probe of the quark-gluon plasma (QGP), charm quarks have been widely studied in heavy-ion collisions. They have provided unique insights into the parton energy loss and the degree of thermalization in the hot medium, but an inadequate knowledge of the hadronization processes has hampered the interpretation of experimental results. In heavy-ion collisions, charm hadron production can occur via coalescence, where charm quarks combine with the surrounding light quarks in the QGP. The relative coalescence contribution is expected to be more significant for hadrons with a larger number of constituent quarks, so the modification of the baryon-to-meson ratio in heavy-ion collisions will reflect the effect of coalescence, and the effect is stronger for particles with more than three constituent quarks. Therefore, measurements of Λ_c^+ and X(3872) production can provide important input to the understanding of coalescence. The high luminosity datasets collected by the CMS detector have been used to measure Λ_c^+ and X(3872) production via $\Lambda_c^+ \rightarrow p^+ K^- \pi^+$ and $X(3872) \rightarrow J/\psi \pi^+ \pi^-$. Results of the ratios of Λ_c^+ over D^0 yields in pp and PbPb collisions and of X(3872) over $\psi(2S)$ yields in PbPb collisions will be shown. The nuclear modification factors of Λ_c^+ will also be presented.

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