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Recent LHCb results on open charm and charmonium production

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Heavy quark production in high-energy collisions is a sensitive probe of QCD and nuclear matter effects. Open heavy-flavor hadrons and quarkonium states provide complementary insights into initial-state effects, such as nuclear parton distribution modifications and parton energy loss, as well as final-state effects like medium interactions and possible Quark-Gluon Plasma (QGP) formation. Observations of QGP-like signatures in high-multiplicity small systems further motivate systematic studies across different collision systems.
In this contribution, we present recent LHCb results on open charm and quarkonium production in pp, pPb, and PbPb collisions. The measurements include various charm hadrons and quarkonium states, offering new constraints on heavy-quark production, hadronization, and medium effects. These results improve our understanding of QCD dynamics across system sizes.

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