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Charm and beauty production measurements to constrain transport models with ALICE

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Heavy quarks are effective probes to investigate the quark-gluon plasma (QGP) produced in heavy-ion collisions since they are primarily produced in hard-scattering processes before the formation of the QGP. Therefore, measurements of heavy-flavour hadron production in nucleus-nucleus collisions are crucial to investigate the mechanisms of interaction of heavy quarks inside the QGP and test the predictions of in-medium energy loss calculations. In addition, they provide unique experimental capabilities to study the properties of heavy-quark hadronization in hadronic collisions.

In this contribution, we present the nuclear modification factors (R_{AA}) of charm mesons and baryons, non-prompt strange and non-strange D mesons and heavy-flavour hadron decaying to leptons measured in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV by the ALICE Collaboration.

In addition, the measurement of the azimuthal anisotropy of prompt and non-prompt D mesons is discussed. The second harmonic coefficient helps to investigate the degree of thermalization of charm and beauty quark in the hot and dense QCD medium. A systematic comparison of experimental measurements with model calculations will be presented to disentangle different model contributions and provide significant constraints to the QGP's charm-quark diffusion coefficient D_s .

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