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Production of Muons from Heavy-Flavour Hadron Decays in Pb–Pb Collisions at $\sqrt{s_{\rm NN}} = 2.76$ TeV with ALICE at the LHC

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The LHC heavy-ion physics program aims at investigating the properties of QCD matter at extremely large temperature and energy density, where the formation of the Quark-Gluon Plasma (QGP) is expected. In high-energy heavy-ion collisions, heavy quarks (charm and beauty) are regarded as efficient probes of the properties of the QGP as they are created on a very short time scale in initial hard scattering processes and subsequently interact with the medium.

At high transverse momentum ($p_{\rm T}$), heavy-flavour yields are suppressed due to in-medium parton energy loss. This suppression is quantified by the nuclear modification factor $R_{\rm AA}$, defined as the ratio of the particle yield measured in Pb-Pb collisions to the cross section in pp collisions scaled with the average nuclear overlap function.

At low $p_{\rm T}$ the heavy-flavour azimuthal anisotropy provides insight into whether heavy quarks participate in the collective expansion of the medium, and at high $p_{\rm T}$ it carries information on the path-length dependence of parton energy loss.
The heavy-flavour azimuthal anisotropy is quantified via the measurement of the second order coefficient (v_2) of the Fourier expansion of particle azimuthal distributions, also called elliptic flow.

With ALICE, designed and optimised for the study of heavy-ion physics, we can measure open heavy flavours at forward rapidity ($2.5 < y < 4$)
via their muonic decays. The latest results on the nuclear modification factor and elliptic flow of muons from heavy-flavour hadron decays in Pb–Pb collisions at $\sqrt{s_{\rm NN}} = 2.76$ TeV will be presented.

On behalf of collaboration:

ALICE

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