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Nuclear Modification Factor and Elliptic Flow of Muons from Heavy-Flavour Hadron Decays in Pb-Pb Collisions at sqrt(s_NN)=2.76 TeV with ALICE

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

In the high transverse momentum region, the suppression of the yield of heavy- flavoured hadrons, quantified by means of the nuclear modification factor, RAA, defined as the ratio of the yield measured in Pb–Pb to that observed in pp collisions scaled with the number of binary nucleon-nucleon collisions, is used to study the heavy quark in-medium energy loss mechanisms. The heavy-flavour elliptic flow, the second order coefficient of the Fourier expansion of particle azimuthal distributions (relative to the reaction plane), pro- vides insight into the degree of thermalization of heavy quarks in the deconfined medium and carries information on the path-length dependence of parton energy loss in the low and high transverse momentum region, respectively.

With ALICE, the detector designed and optimized for heavy-ion physics at the LHC, open heavy flavours are measured at forward rapidity ($2.5 < y < 4$) using semi-muonic decays. The latest results on the nuclear modification factor and elliptic flow of muons from heavy-flavour decays in Pb–Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV will be presented. Comparisons with theoretical predictions will be discussed.

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