

# Heavy-flavour production in pp and AA collisions at the LHC

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A refined version of a multi-step calculation of heavy-flavour observables in pp and AA collisions has been developed, based on pQCD at NLO accuracy followed by parton shower evolution to describe heavy-quark production and on the relativistic Langevin equation to describe their stochastic evolution in the QCD plasma. Then, hadronization is modeled through an implementation of the available experimental data on heavy-quark fragmentation fractions and a set of pQCD fragmentation functions into pseudo-scalar and vector mesons. Results of our calculations can be compared with some recent measurements performed at the LHC in Pb-Pb collisions at  $\sqrt{s_{NN}}=2.76$  TeV: pT-differential spectra at mid-rapidity of heavy-flavour decay electrons and of exclusively reconstructed open-charm mesons at different centralities, as well as their nuclear modification factor RAA with respect to the pT spectra observed in pp collisions. In addition, predictions are given for the pT-differential elliptic-flow  $v_2(pT)$  of open-charm mesons measured at mid-rapidity. To test the validity of our setup for such studies, its predictions are also checked against the pT spectra measured in pp collisions at  $\sqrt{s}=2.76$  TeV and 7 TeV, considered as benchmark data samples.

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