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Open heavy-flavour and electroweak boson measurements via the (di-)muonic decay channel with ALICE at the LHC

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Heavy flavours (charm and beauty) and electroweak bosons (W and Z) are produced in initial hard partonic scatterings. The former interact strongly with the medium formed in ultra-relativistic heavy-ion collisions throughout its evolution, thus making them well suited to investigate its properties. Furthermore, heavy-flavour measurements in proton-nucleus collisions can be used to investigate initial-state effects whereas in proton-proton (pp) collisions they are considered an important test for perturbative Quantum ChromoDynamics (pQCD) predictions. In addition, the open heavy-flavour measurements in pp collisions are used as a reference for proton-lead (p–Pb) and lead-lead (Pb–Pb) collisions.
On the other hand, electroweak bosons and their leptonic decay products only interact weakly with the QCD matter and thus are suitable probes to test the validity of binary-collision scaling of hard processes. Moreover, their measurements in p–Pb collisions could help to constrain nuclear parton distribution functions.

The ALICE muon spectrometer allows the measurement of open heavy flavour, W- and Z-boson production at forward rapidity (-4.0< η <-2.5) exploiting their (di)muonic decay channel. In this talk the results obtained with the LHC Run I data in pp, p–Pb and Pb–Pb collisions will be discussed and compared with theoretical predictions.

Summary

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