Contribution ID: **27** Type: **Contributed Oral Presentation**

Production of heavy flavours via semi-muonic decays using Monte Carlo Simulations

The purpose of the ALICE Experiment is to study the properties of a hot, dense state of matter called the quark gluon plasma (QGP), produced in nucleus-nucleus collisions, in which quarks and gluons are deconfined. Proton-proton collisions serve as source of baseline measurements that support studies for the more complex nucleus-nucleus collisions as well as to test quantum chromodynamics (QCD) based theoretical models. Our work studies the decays of heavy-flavour quarks and their hadrons in the semi-muonic decay channel at forward rapidity ($-4 < \eta < -2.5$). Heavy quarks are produced in the early stages of collisions with high momentum transfer and short formation time. Their flavour is conserved in strong interactions, thus allowing us to use them as probes of the QGP. They also help to give us insight into the quark-gluon composition of protons.

Monte Carlo simulation is an important tool for the study of heavy quark production at the ALICE experiment. It is a powerful way to test the accuracy of the standard model - particularly quantum chromodynamics - by benchmarking simulated data with real world data collected by the ALICE detector. We conducted two sets of simulations of proton-proton collisions at forward rapidity in the ALICE detector. The results are compared to real world collision data collected by ALICE, at $\sqrt{s}$ = 5.02 TeV and $\sqrt{s}$ = 13 TeV at the LHC. To perform our comparisons, we computed the transverse momentum differential cross sections as well as the η-differential cross sections from each of the data sets.

Abstract Category

Particle Physics

Primary author: MABITSELA, Retsilisitsoe (University of the Witwatersrand (ZA))

Presenter: MABITSELA, Retsilisitsoe (University of the Witwatersrand (ZA))

Session Classification: Parallel Session 1

Track Classification: Physics Research