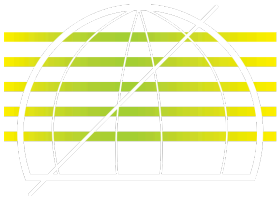

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Commissioning and first performances of the ALICE MID RPCs

Monday, 26 September 2022 11:00 (25 minutes)

ALICE (A Large Ion Collider Experiment) at the CERN Large Hadron Collider (LHC) is designed to study proton-proton (pp) and heavy-ion (Pb-Pb) collisions at ultrarelativistic energies. The main goal of the experiment is to assess the properties of the quark-gluon plasma (QGP), which is a state of matter reached in extreme conditions of temperature and energy density, where quarks and gluons are deconfined.
One of the main observables used to study the QGP is the production of heavy quarkonia in Pb-Pb collisions. Quarkonia are bound states of a heavy quark (c or b) and the corresponding anti-quark. In order to detect quarkonia via their dimuon decays, ALICE is equipped with a forward muon spectrometer.
During the LHC Run 1 and Run 2 the selection of interesting events for muon physics in ALICE was performed with a dedicated muon trigger system based on Resistive Plate Chambers operated in maxi-avalanche mode. During the long shutdown 2 of LHC that ended this year, ALICE had a major upgrade of its apparatus: from Run 3 (started in July 2022) on, in order to fully profit from the increased interaction rate of Pb-Pb collisions (from 10 kHz to 50 kHz), the ALICE experiment will run in continuous readout (triggerless) mode and the Muon Trigger became the Muon IDentifier (MID).
In order to reduce the ageing and make the RPCs lifetime comparable to the experiment data taking period, and to increase the RPCs rate capability, it was chosen to use the same avalanche mixture, but at lower gain, to reduce the charge released per hit inside the gas gap. The front-end and readout electronics has been upgraded, in order to optimize the detector performance in the new running conditions.
A detailed description of the MID upgrades, together with the results and performance of the RPCs from the commissioning with cosmic rays and the first LHC pp collisions data at the unprecedented center-of-mass energy of 13.6 TeV, will be presented in this talk.

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