Contribution ID: **71** Type: **Talk**

Upgrade, commissioning and first performance of the ALICE Muon Spectrometer

Monday 4 September 2023 15:10 (20 minutes)

ALICE (A Large Ion Collider Experiment) at the CERN Large Hadron Collider (LHC) is designed to study proton-proton and heavy-ion collisions at ultra-relativistic energies. The main goal is to assess the properties of quark gluon plasma (QGP), a state of matter where quarks and gluons are deconfined, reached in extreme conditions of temperature and energy density.
One of the main observables used to probe the QGP is the production of heavy quarkonia in Pb-Pb collisions. ALICE is equipped with a forward Muon Spectrometer (MS) to detect quarkonia via their dimuon decays.
In view of the LHC Run 3 (2022), ALICE had a major upgrade of its apparatus to enable a new programme of high-precision measurements and to cope with an increased collision rate, up to 50 kHz in Pb-Pb collisions (was 10 kHz in Run 2).
For the MS, ALICE implemented new hardware and software solutions. A new vertex tracker based on Monolithic Active Pixel Sensor technology, the Muon Forward Tracker (MFT), was installed in the acceptance of the MS. It allows one to separate, for the first time in ALICE at forward-rapidity, prompt and non-prompt contributions to the cross sections of charmonia. Moreover, the new MS vertexing capabilities greatly improve the invariant mass resolution, allowing for a better separation between J/ψ and ψ(2S) states, down to zero transverse momentum.
As a further upgrade of the MS, the front-end and readout electronics of the Muon Tracking System (Cathode Pad Chambers) and of the Muon Identification System (Resistive Plate Chambers) have been upgraded to optimize the detector performance and lifetime in the new running conditions.
A description of the MS upgrades and commissioning, together with the performance achieved with the first Run 3 data, will be presented.

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Session Classification: Gas Based Detectors

Track Classification: Gas-based Detection Methods