



Contribution ID: 68

Type: **Parallel Talk**

Muon physics at forward rapidity with the ALICE detector upgrade

Tuesday, May 15, 2018 9:40 AM (20 minutes)

ALICE is the experiment specifically designed for the study of the Quark-Gluon Plasma in heavy-ion collisions at the CERN LHC. The ALICE detector will be upgraded during the LHC Long Shutdown 2, planned for 2019-2020, in order to cope with the maximum interaction rate of 50 kHz of Pb-Pb foreseen for Runs 3 and 4.

The ambitious programme of high-precision measurements, expected for the muon physics after 2020, requires an upgrade of the front-end and readout electronics of the existing Muon Spectrometer. This concerns the Cathode Pad Chambers (CPC) used for the tracking and the Resistive Plate Chambers (RPC) used for triggering purposes and muon identification. The RPC will be operated with amplification, contrary to what is currently done, with a new FEERIC front-end chip. Regarding the CPC, a new all-in-one SAMPA chip will be used to equip the 1.1 million readout channels. For both systems the data transmission will use the GBT chip, developed at CERN, and a Common Readout Unit (CRU) which will send the data to the acquisition.

The Muon Forward Tracker (MFT), an internal tracker added in front of the front absorber of the existing Muon Spectrometer, is also part of the ALICE detector upgrade programme. It is based on an assembly of circular planes made of Monolithic Active Pixel Sensors (MAPS), covering the pseudorapidity range $2.5 < \eta < 3.6$. The MFT will improve present measurements and enable new ones. In particular, the precise measurement of the offset to the primary vertex for the muon tracks will permit, for the first time in ALICE, the statistical separation of open charm and beauty production at forward rapidity, rejecting at the same time a large fraction of background muons coming from pion and kaon decays. A selection of results from the physics performance studies will be presented, together with an overview of the technical aspects of the upgrade project.

Content type

Experiment

Collaboration

ALICE

Centralised submission by Collaboration

Presenter name already specified

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Session Classification: Future facilities, upgrades and instrumentation

Track Classification: Future facilities, upgrades and instrumentation