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Prospects for ALICE physics with the Muon Spectrometer Upgrade and the new Muon Forward Tracker

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 fully exploit
the large integrated luminosity that will be provided by the LHC in Run˜3 and Run˜4.

The Muon Forward Tracker (MFT), an internal tracker added in the acceptance of the existing Muon Spectrometer
and designed to cover the pseudorapidity range $2.5 < \eta < 3.6$, will be part of the \mbox{ALICE} detector upgrade programme,
allowing for a crucial improvement of the measurements presently done with the Muon Spectrometer, and giving
access to new measurements. The precise estimation of the offset to the primary vertex for the muon tracks, in particular, will permit
the statistical separation of open charm ($c\tau \sim 120 - 300$ μm) and beauty ($c\tau \sim 500$ μm) production,
including displaced vertices related to J/ψ production from B˜decays, rejecting at the same time a
large fraction of background muons coming from pion and kaon decays.

Beyond the installation of the new MFT, the ambitious programme of high-precision measurements expected to characterise
the ALICE muon physics after 2020, will also impose the upgrade of the front-end and readout electronics of the existing Muon Spectrometer. A selection of results from the physics performance studies will be presented, together with an overview of
the technical aspects of the MFT project and the upgrade of the Muon Spectrometer electronics.

Preferred Track

Future Experimental Facilities, Upgrades, and Instrumentation

Collaboration

ALICE

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