

# MID: a muon detector for the ALICE 3 upgrade project

## Content

The success of the ALICE programme has allowed to study the hottest state of matter created in the laboratory: the strongly-interacting quark–gluon plasma (sQGP). However, some fundamental questions on the sQGP and other aspects of the strong interaction will still remain open even after LHC Run 4. To address this, the ALICE collaboration has proposed a major upgrade of its detector, known as ALICE 3. Among the subdetectors considered in this upgrade there is the muon identification detector (MID) aimed at contributing to the study of charmonium and exotic hadron production in heavy-ion collisions. While the baseline design consists of plastic-scintillator-based chambers placed around a cylindrical magnetic iron absorber, different detector technologies are under evaluation for the MID, including multi-wire proportional chambers.

In this contribution, the status of GEANT4 simulations and FLUKA calculations of the radiation load during LHC Run 5 will be presented, together with the construction and CERN T10 test-beam results of a prototype composed of 48 FNAL-NICADD scintillator bars ( $100 \times 4 \times 1 \text{ cm}^3$ ) with Kuraray WLS fibers and Hamamatsu silicon photomultipliers, tested using 3 GeV/c muon and pion beams and analyzed with Machine Learning techniques. The muon efficiency as well as the hadron suppression will be discussed.

## Summary

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