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The ALICE detector upgrade program

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ALICE is the experiment at the LHC devoted to the study of the strongly-interacting matter produced at high temperature and high energy density in ultra-relativistic heavy-ion collisions. In parallel with the successful operation of the experiment and with the rich physics output obtained during the first two runs of the LHC, the ALICE collaboration is working on a major upgrade of its detector. The main physics goal of this upgrade is the improvement of the precision of heavy flavours, quarkonia, direct real and virtual photons, jets and low-mass dileptons, with particular emphasis on their production in the low momentum region. The general upgrade strategy, which will be deployed during the second LHC long shutdown (LS2, 2019-2020) in view of the LHC Runs 3 and 4 (2021 to 2029), is conceived to deal with expected Pb-Pb interaction rates up to 50 kHz with the goal of integrating the luminosity to the order of 10 nb^{-1} .

In this presentation, we will discuss the modifications and replacements needed in the ALICE detector: the new GEM-based readout chambers of the TPC, the new pixel silicon trackers (Inner Tracking System and Muon Forward Tracker), the new readout and trigger architecture and the new online-offline computing facility.

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