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ALICE upgrades and preparations for physics in Run 3

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ALICE has undergone a major upgrade in preparation of LHC Run 3 (2022-2025). All detectors have been upgraded to allow readout at higher rates, matching the interaction rates provided by the LHC. The Inner Tracking System now completely consists of Monolithic Active Pixel Sensors, which also improves pointing resolution. The Time Projection Chamber has been equipped with GEM-based readout chambers to allow the operation with Pb-Pb collision rates of ˜50 kHz. The muon system has also been upgraded and extended by the Muon Forward Tracker. New trigger detectors were installed to allow the clean identification of interactions. All detectors have seen upgrades of the readout chain to make use of the increased luminosity expected from the LHC. Furthermore, the computing infrastructure and software stack have been redesigned for continuous read-out and including a synchronous reconstruction stage making use of 2000 GPUs to achieve the required computing performance. An asynchronous reconstruction stage after data taking provides an improved reconstruction by taking into account calibration results. The reconstructed data are stored on grid sites for analysis through an improved system of analysis trains. In this presentation, we will report on the installation of the detectors and the computing farm, their commissioning with and without beam, as well as first results with pp collision.

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