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Usage of GPUs in ALICE Online and Offline processing during LHC Run 3

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ALICE will significantly increase its Pb–Pb data taking rate from the 1\,kHz of triggered readout in Run 2 to 50 kHz of continuous readout for LHC Run 3.
Updated tracking detectors are installed for Run 3 and a new two-phase computing strategy is employed.
In the first synchronous phase during the data taking, the raw data is compressed for storage to an on-site disk buffer and the required data for the detector calibration is collected.
In the second asynchronous phase the compressed raw data is reprocessed using the final calibration to produce the final reconstruction output.
Traditional CPUs are unable to cope with the huge data rate and processing demands of the synchronous phase, therefore ALICE employs GPUs to speed up the processing.
Since the online computing farm performs a part of the asynchronous processing when there is no beam in the LHC, ALICE plans to use the GPUs also for this second phase.
This paper gives an overview of the GPU processing in the synchronous phase, the full system test to validate the reference GPU architecture, and the prospects for the GPU usage in the asynchronous phase.

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