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The ALICE High Level Trigger, status and plans

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The ALICE High Level Trigger (HLT) is an online reconstruction, triggering and data compression system used in the ALICE experiment at CERN. Unique among the LHC experiments, it extensively uses modern co-processor technologies like general purpose graphic processing units (GPGPU) and field programmable gate arrays (FPGA) in the data flow. Real-time data compression is performed using a cluster finder algorithm implemented on FPGA boards. These data, instead of raw clusters, are used in the subsequent processing and storage, resulting in a compression factor of around 4. Track finding is performed using a cellular automaton and a Kalman filter algorithm on GPGPU hardware, where both CUDA and OpenCL technologies can be used interchangeably.
The ALICE upgrade requires further development of online concepts to include detector calibration and stronger data compression. The current HLT farm will be used as a test bed for online calibration and both synchronous and asynchronous processing frameworks already before the upgrade, during Run 2.

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