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Alice HLT TPC Tracking of PbPb-Events on GPU and CPU — •David Rohr and Sergey Gorbunov for the ALICE-Collaboration — Frankfurt Institute for Advanced Studies, University of Frankfurt, Germany

The ALICE experiment for the Large Hadron Collider was specifically designed to study heavy ion collisions. Track reconstruction for the TPC is an extremely complex task because of the very high number of particles in the chamber. The ALICE High Level Trigger requires real-time tracking for a precise trigger decision. A fast online tracking algorithm was developed that can run on both CPU and GPU. The algorithm starts with combinatorial tasks on a cellular automaton principle followed by a Kalman filter step. This makes it extremely suited to run on parallel hardware. During the development a new GPU generation was released and the tracker was adapted to make use of the latest graphics processors. The GPU hardware accelerator can play its strength in heavy ion collisions. GPU enabled compute nodes were deployed and commissioned in late 2010. The first heavy ion events were successfully reconstructed in real-time by the ALICE HLT. The cluster has sufficient compute resources available to handle the increased luminosity which is expected in the next heavy ion session of LHC. First results, benchmarks, and QA plots are presented.

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