

Physics and throughput performance of the real-time reconstruction for the LHCb upgrade

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In the beginning of 2021, the upgraded LHCb experiment will use a triggerless readout system collecting data at an event rate of 30 MHz. During the first stage of High-Level Trigger (HLT1), a sub-set of the full offline track reconstruction for charged particles is run to select particles of interest based on single or two-track selections. After this first stage, the event rate is reduced by at least a factor 30. Track reconstruction at 30 MHz represents a significant computing challenge, requiring a renovation of current algorithms and the underlying hardware. In this talk both the computing and physics performance of the full HLT1 chain will be presented. We will particularly focus on the development of highly parallel algorithms optimized for many-core architectures.

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