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The LHCb trigger in Run II

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The LHCb trigger system has been upgraded to exploit the real-time alignment, calibration and analysis capabilities of LHCb in Run-II.
An increase in the CPU and disk capacity of the event filter farm, combined with improvements to the reconstruction software,
mean that efficient, exclusive selections can be made in the first stage of the High Level Trigger (HLT1).
For example, this permits, for the first time, lifetime unbiased charm and beauty selections.
The overall output rate of HLT1 is increased by roughly a factor of two, to 150 kHz, which allows an increase in the efficiency for charm signals in particular.
The output of HLT1 is buffered to the 5 PB of disk on the event filter farm, while the detector is aligned and calibrated in real time.
The second stage, HLT2, performs complete, offline quality, event reconstruction.
Physics analyses can be performed directly on this information, and for the majority of charm physics selections,
a reduced event format can be written out, which permits higher event rates.
Beauty hadron decays are more efficiently triggered by re-optimised inclusive selections, and the HLT2 output event rate
is increased by a factor of three.

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