



DEVELOPMENT OF HIGH-PERFORMANCE RECONSTRUCTION ALGORITHMS FOR DETECTING LONG-LIVED PARTICLES

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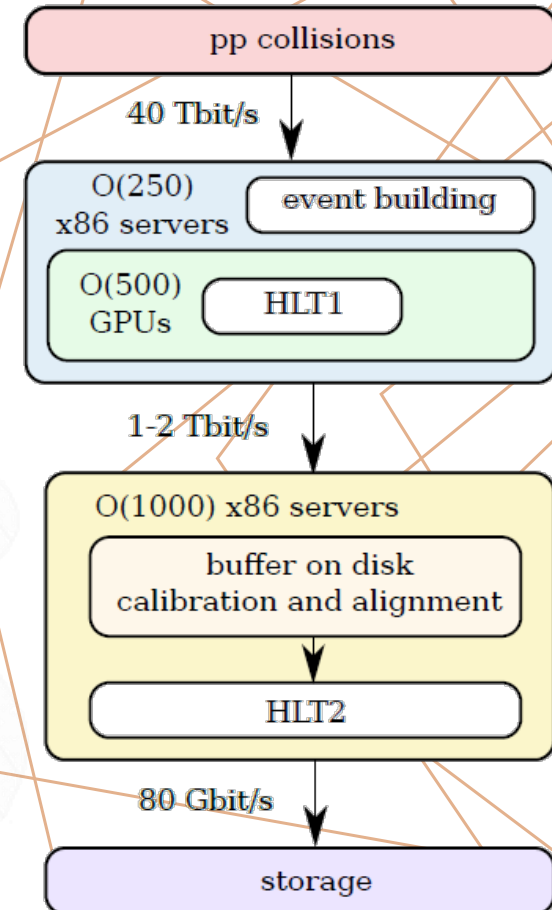
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LHCb UPGRADE

GPU-enhanced LHCb data acquisition system:

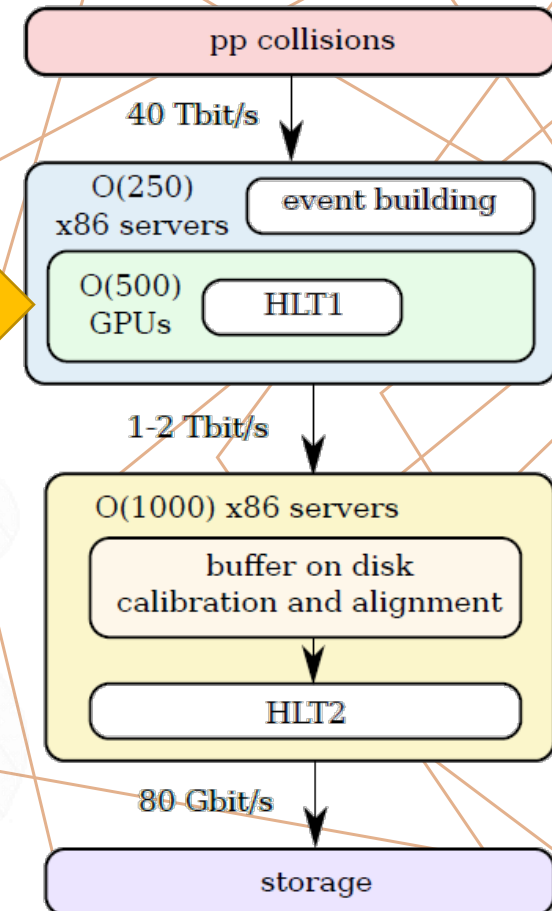
- x86 event building units
- 500 GPUs process HLT1
- Only events selected by HLT1 are sent to the x86 servers processing HLT2.



LHC*b* UPGRADE

Allen: A high level trigger on GPUs for LHC*b*:

- CUDA-based framework
- Implement HLT1 stage
- Process up to 40 Tbit/s data rate:
 - Reconstruction of charged particles trajectories
 - Finding collision points
 - Identifying particles as hadrons or muons
 - Finding the displaced decay vertices

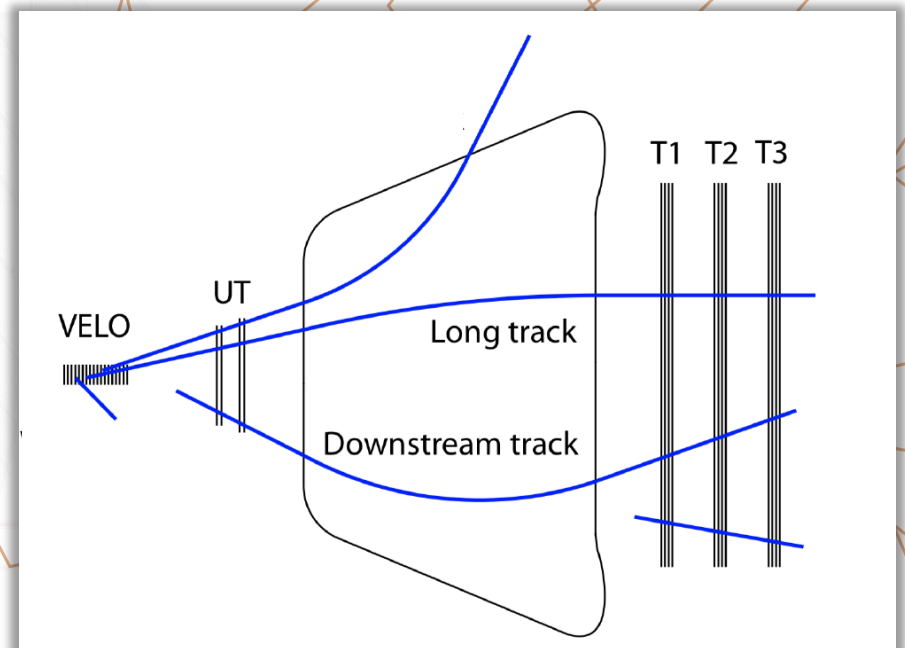
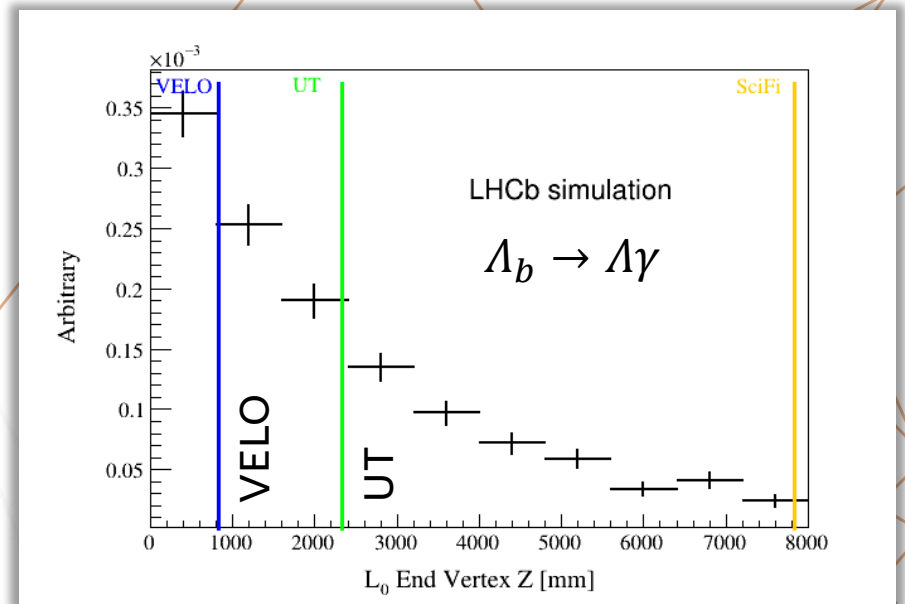


LONG-LIVED PARTICLES

- Large fraction decays outside of VELO:
 - For $\Lambda_b \rightarrow \Lambda \gamma$:
 - 51% - hits UT & SciFi
 - 37% - hits SciFi only
 - Development of downstream track reconstruction within Allen framework is extremely important!

The objective of my project:

Contribution to this development



A decorative graphic in the top-left corner consisting of several thin, overlapping, light-brown lines that form a complex, abstract geometric shape, possibly resembling a stylized 'V' or a series of intersecting planes.

THANK YOU FOR
YOUR ATTENTION

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