

Trigger considerations for MVTX

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MVTX latency

- The MVTX pixel sensor (ALPIDE) is optimized for a trigger with relatively small latency ($\sim 1.2 \mu\text{s}$)
 - ▶ We are working on changing the shaping time of the ALPIDE analog frontend so we can trigger at $4 \mu\text{s}$, but no proof of concept yet
- MVTX is capable of very high trigger rates (ALICE ITS is designed for up to 400 kHz p-p), could work with a fast but non-selective L0 trigger

Track trigger

- MVTX is considering the possibility of a track trigger for displaced vertices (b trigger)
- An MVTX track trigger will have significant latency (probably slower than $4\ \mu\text{s}$) due to ALPIDE shaping and readout times, plus a complicated trigger decision
- This seems to require some sort of event buffering, either at the FEMs or further downstream

Proposals for discussion

- Is there a possibility to speed up the L1 trigger decision from the current spec of $4\ \mu\text{s}$?
 - ▶ What is the bottleneck?
- Fast L0 trigger: can we get a trigger from fast detectors (BBC, ZDC, INTT?) that can be used for MVTX?
 - ▶ What trigger rate could we expect for an L0 trigger that is a superset of the L1 trigger?
- Event buffering: possibility for event buffering in detectors or in main DAQ, such that a track trigger decision can be made?