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Online Track-finding and Event Selection in Hardware at 40 MHz

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High intensity beams, such as the M2 muon beam at CERN, provide a significant challenge to DAQ systems, in particular when reading out many sensors. For example, beam tests conducted by the MUonE experiment used silicon strip sensors with a bandwidth of 5 Gb/s per module.

Future beam tests will incorporate up to 18 of these modules connected to a triggerless readout system. Limits on processing and data storage will necessitate online event selection to be implemented on state-of-the-art AMD-Xilinx UltraScale+ FPGAs.

This talk will present a general purpose platform for online event selection, from simple occupancy cuts, to track reconstruction, vertexing and particle identification using low-latency machine learning.

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