

# 12th Beam Telescopes and Test Beams Workshop



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## Results for Online Track-fitting in Hardware at 40 MHz

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Central to particle physics experiments using high intensity beams is event selection to allow DAQ systems to cope with high data rates. This is true for the MUonE experiment, both for its final configuration and upcoming test beams. Online track-fitting for event selection will be implemented directly on FPGAs, using High-Level Synthesis to convert C++ code into an HDL description to then run on the FPGA. In the fall of 2023, during a beam test at the M2 beamline at CERN, an initial hardware tracking implementation was tested in parallel to the mainline DAQ. Results from this test will be presented, including agreement with offline reconstruction, algorithm performance, as well as improvements on the tested algorithm which decrease latency and resource use. Results from an event selection using the patterns of stubs in adjacent tracking stations, which was tested offline using test beam data, will also be presented.

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