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Triggering on muon showers in the Barrel Muon Trigger of the CMS experiment for the HL-LHC upgrades.

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The Phase-2 CMS upgrade for HL-LHC includes replacing the trigger and data acquisition system. Upgrades to the readout electronics will enable a maximum L1 accept rate of 750 kHz with a latency of 12.5 μ s. The muon trigger, using multi-layer systems, reconstructs and measures muon momenta by analyzing data from muon chambers with pattern recognition algorithms running on FPGA processors. The Layer-1 Barrel Muon Filter refines and correlates information from barrel muon stations before sending it to the track finders. An algorithm for detecting and identifying muon showers has been developed, demonstrated in firmware, and assessed for physics performance.

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