

Abstract Submitted
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The Design of an Upgrade to the Level-1 Trigger for the Endcap Muon System of the CMS Experiment MATTHEW CARVER, University of Florida, CMS COLLABORATION — We present a description of a novel track finding algorithm and associated hardware to be implemented as an upgrade to the L1-Trigger of the endcap muon system of the CMS experiment at the LHC in Geneva, Switzerland. To handle the increased luminosity and pile-up expected from the LHC after the current shutdown, the algorithm uses predefined patterns to identify tracks left by muons in the detector at a rate of 40 MHz. If multiple tracks are found they are sorted on the quality of the muon, defined by the number of hit detectors and straightness of the pattern. The track finding logic is pipelined such that the trigger will operate with no deadtime and has an available latency on the order of $1 \mu s$ to make a decision. The electronics board housing this logic makes use of state-of-the-art field-programmable gate arrays and large memory lookup tables to accomplish its track finding purpose. Preliminary studies on simulated data show roughly 99.5% efficiency for both single and multiple muon tracks.

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