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Track Finding at the Level-1 Trigger at CMS in the HL-LHC.[1]
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During the second long shutdown of the Large Hadron Collider (LHC), the Compact Muon Solenoid (CMS) detector will require an upgrade to its trigger hardware as the LHC enters the era of the High Luminosity Large Hadron Collider (HL-LHC). With the significant increase of instantaneous luminosity, charged particle tracking will be necessary at CMS at the level of the hardware trigger to limit the rate going into the software trigger. The tracklet and Hough-transform algorithms are two approaches designed to meet the goals of the hardware trigger. Both algorithms achieve high performance with operating times within a target of 4 microseconds. An overview of these two approaches is given including an explanation of the algorithms, implementation on FPGAs, and results from system performance studies.

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