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An extension to the Analytical Method clustering algorithm for BMTL1 benefitting from CMS RPC timing

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This poster introduces an extension to the Analytical Method clustering algorithm designed for the Barrel Muon Track Finder Layer 1 (BMTL1) for HL-LHC. The new extension leverages the enhanced timing capabilities of the CMS RPC system. The new algorithm significantly reduces the prefiring of muons. This method addresses challenges associated with high particle flux environments, ensuring robust and reliable muon track reconstruction. The presentation will cover the algorithm's development, its integration with existing CMS infrastructure, and comparative results demonstrating its performance improvements over traditional clustering methods. Data from MC simulations, which showcase the algorithm's effectiveness, will also be shared.

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