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Dedicated Triggers for Displaced Jets using Timing Information from Electromagnetic Calorimeter at HL-LHC

Friday 9 September 2022 11:40 (20 minutes)

In this paper, we study the prospect of ECAL barrel timing to develop triggers dedicated to long-lived particles decaying to jets, at the level-1 of HL-LHC. We construct over 20 timing based variables, and identify two of them which have better performances and are robust against increasing PU. We estimate the QCD prompt jet background rates accurately using the “stitching” procedure for varying thresholds defining our triggers, and compute the signal efficiencies for different LLP scenarios for a permissible background rate. The trigger efficiencies can go up to O(80%) for the most optimal trigger for pair-produced heavy LLPs having high decay lengths, which degrades with decreasing mass and decay length of the LLP. We also discuss the prospect of including the information of displaced L1 tracks to our triggers, which further improves the results, especially for LLPs characterised by lower decay lengths.

Is this abstract from experiment?

No

Name of experiment and experimental site

N/A

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

Yes

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