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Calorimeter performance studies using Monte Carlo simulations for future collider detectors

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Performance requirements for future calorimeter designs in the context of reconstruction of tens-of-TeV jets at 100 TeV colliders are discussed. Lateral cell segmentation was studied by reconstructing substructure variables for hadronic jets above 10-TeV in transverse momentum using the Geant4 simulations with a different granularity of calorimeter cells. The physics potential of timing layers in calorimeters with a few tens of picosecond resolution is also explored. These studies show how calorimeters with precise timing information can be used for particle identification. We also illustrate the potential of precise timing information for detecting new event signatures originating from physics beyond the standard model.

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