

Searching for long-lived particles at the LHC and beyond: Eighth workshop of the LHC LLP Community



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Fast convolutional neural networks for identifying long-lived particles in a high-granularity calorimeter (12'+3')

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We present a first proof of concept to directly use neural network based pattern recognition to trigger on distinct calorimeter signatures from displaced particles, such as those that arise from the decays of exotic long-lived particles. The study is performed for a high granularity forward calorimeter similar to the planned high granularity calorimeter for the high luminosity upgrade of the CMS detector at the CERN Large Hadron Collider. Without assuming a particular model that predicts long-lived particles, we show that a simple convolutional neural network, that could in principle be deployed on dedicated fast hardware, can efficiently identify showers from displaced particles down to low energies while providing a low trigger rate.

<https://arxiv.org/abs/2004.10744>

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