Particle Identification with CMS Data using ML

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Abstract

This project focuses on electron identification using simulation data of Z -> ee decays. While typical CMS studies look at electrons within a range of pseudorapidity ($-2.5 < \eta < 2.5$), this project tries to expand this range to include a wider pseudorapidity ($-5 < \eta < 5$), covering the Hadronic Forward (HF) region. By doing so, we aim to detect more electrons and gain new insights into how particles interact. We use Boosted Decision Trees (BDT) to train on generated data, which helps us identify and correct electron energies. By incorporating HF coverage into electron detection, physics measurements can leverage a broader spectrum of accepted electrons, potentially offering new insights into particle interactions.