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End-to-end tau reconstruction and identification using transformers

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Tau leptons serve as an important tool for analyzing the production of Higgs and electroweak bosons in the context of the Standard Model as well as for physics phenomena beyond the Standard model. Therefore, an accurate reconstruction and identification of the hadronically decaying tau leptons is a crucial for contemporary and future high energy physics experiments. Building on the results of novel tau tagging algorithms, we show the tau energy and decay mode reconstruction performance of the end-to-end transformer based machine learning methods in comparison with the algorithms currently used at various experiments. The algorithms are evaluated on the electron-positron collisions simulations with realistic detector effects and ParticleFlow-based event reconstruction. The results are expected to be applicable also to other future electron-positron and proton-proton colliders.

Alternate track

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Yes

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